1-3-1
ME

REGULATIONS, COURSE STRUCTURE AND SYLLABUS

(Aligned with AICTE Model Curriculum & APSCHE Curriculum)

SITE 18 REGULATIONS

For

B.Tech.

Civil Engineering

With effective from the Academic Year

2018-19

sasi INSTITUTE OF TECHNOLOGY & ENGINEERING
autonomous
Accredited by NAAC with "A" Grade
Recognised by UGC under section 2(f) &12(B)
Approved by AICTE - NEW Delhi
Permanently Affiliated to JNTUK, SBTET
Ranked as "A" Grade by Govt. of A.P.
Department of Civil Engineering

B. Tech. (Civil Engineering)
SITE 18 Regulation
Semester I (First Year)

S. No.	Subject Code	Subject title	L	T	P	C
1	18CMEGT1010	Technical English	3	0	0	3
2	18CMMAT1020	Engineering Mathematics-I	3	1	0	4
3	18CMCHT1030	Engineering Chemistry	3	1	0	4
4	18CMEET1040	Basic Electrical Engineering	3	1	0	4
5	18CMEGL1050	English Communication skills lab	0	0	2	1
6	18CMCHL1060	Engineering Chemistry Lab	0	0	3	1.5
7	18CMEEL1070	Basic Electrical Engineering Lab	0	0	3	1.5
8	18CMMSN1080	Constitution of India, professional ethics & human rights (Non - Credit course)	3	0	0	0
					Total Credits	**19**

I B.TECH II SEM COURSE STRUCTURE

S. No.	Subject Code	Subject title	L	T	P	C
1	18CMMAT2010	Engineering Mathematics II	3	1	0	4
2	18CEPHT2020	Engineering Physics	3	1	0	4
3	18CMCST2030	Programming for problem-solving	3	0	0	3
4	18CMMEL2040	Engineering Graphics	1	0	4	3
5	18CEPHL2050	Engineering Physics Lab	0	0	3	1.5
6	18CMCSL2060	Programming for problem-solving Lab	0	0	4	2
7	18CMMEL2070	Work Shop/ Manufacturing practice	0	0	3	1.5
8	18CMCHN2080	Environmental Science (Non - Credit course)	3	0	0	0
					Total Credits	**19**

Course Structure for B.Tech. (Civil Engineering) Semester III (Second year)

S. No	Course Code	Course Title	L	T	P	C
1	18CEMAT3010	Engineering Mathematics-III	3	1	0	4
2	18CMCET3020	Engineering Mechanics	3	1	0	4
3	18CECET3030	Engineering Geology	2	0	0	2
4	18CECET3040	Surveying & Geomatics	3	0	0	3
5	18CECET3050	Building Materials & Concrete Technology	3	0	0	3
6	18CECEL3060	Engineering Geology Lab	0	0	3	1.5
7	18CECEL3070	Surveying Field work lab	0	0	3	1.5
8	18CECEL3080	Computer-aided Civil Engineering Drawing Lab	0	0	3	1.5
9	18CEECN3090	Basic Electronics (MC)	3	-	-	-
					Total Credits	**20.5**

Course Structure for B.Tech. (Civil Engineering) Semester IV (Second year)

S. No	Course Code	Course Title	L	T	P	C
1	18CECET4010	Fluid Mechanics	3	0	0	3
2	18CECET4020	Strength of Materials	3	0	0	3
3	18CECET4030	Environmental Engineering	3	0	0	3
4	18CECET4040	Transportation Engineering	3	0	0	3
5	18CMMST4050	Engineering Economics and Financial Management	3	0	0	3
6	18CECEL4060	Strength of Material lab	0	0	3	1.5
7	18CECEL4070	Environmental Engineering Lab	0	0	3	1.5
8	18CECEL4080	Material Testing Lab	0	0	2	1.5
					Total Credits	**19.5**

Course Structure for B.Tech. (Civil Engineering)

Semester V (Third year)

S.No	Subject Code	Subject Title	L	T	P	C
1	18CMBIT5010	Biology for Engineers	2	1	0	3
2	18CECET5020	Theory of Structures-I	3	0	0	3
3	18CECET5030	Geo-Technical Engineering	2	0	0	2
4	18CECET5040	Hydrology and Water Resources Engineering	3	0	0	3
5	18CECET5050	Hydraulic Engineering	3	0	0	3
6	18CE--O506x	**OPEN ELECTIVE-I**	3	0	0	3
7	18CECEL5070	Survey Field Camp	0	0	3	1.5
8	18CECEL5080	Geo-Technical Engineering Lab	0	0	3	1.5
9	18CECEL5090	Fluid Mechanics & Hydraulic Machinery Lab	0	0	2	1.5
					Total Credits	**21.5**

Open Elective Courses

1	18xxCEOxxxx	Civil Engineering Societal & Global Impact
2	18xxCEOxxxx	Introduction to Civil Engineering
3	18xxCEOxxxx	Disaster Management
4	18xxCEOxxxx	Environmental Pollution and Control
5	18xxCEOxxxx	Building Materials
6	18xxCEOxxxx	Green Buildings and Sustainability

Course Structure for B.Tech. (Civil Engineering)

Semester VI (Third year)

S.No	Subject Code	Subject Title	L	T	P	C
1	18CMEGT6010	Personality Development & professional Communication	2	0	0	2
2	18CECET6020	Theory of Structures-II	3	0	0	3
3	18CECET6030	Reinforced Concrete Structures	3	0	0	3
4	18CE--O604x	**OPEN ELECTIVE-II**	3	0	0	3
5	18CECET605x	**ELECTIVE-I**	3	0	0	3
6	18CECEL6060	Irrigation Engineering & Drawing Lab	0	0	3	1.5
7	18CECEL6070	Software Applications in Civil Engineering	0	0	3	1.5
8	18CECEC6080	Term Paper with Seminar	0	2	0	2
9	18CECEN6090	Advanced Methods in Structural Analysis	-	-	-	-
					Total Credits	**19**

B.Tech. (Civil Engineering)

Semester VII (Fourth Year)

S.No.	Course Code	Course Title	L	T	P	C
1	18CECET7010	Contracts, Specifications & Project Management	3	0	0	3
2	18CECET7020	Design of Steel Structures	3	0	0	3
3	18CE--o703x	**Open Elective-III**	3	0	0	3
4	18CECEP704x	**Elective-II**	3	0	0	3
5	18CECEP705x	**Elective-III**	3	0	0	3
6	18CECEL7060	Structural design and drawing Lab	0	0	3	1.5
7	18CECER7070	Project phase-I	0	0	8	04
8	18CECEC7080	Internship with seminar	0	0	0	2
Total Credits						22.5

Semester VIII (Fourth Year)

S.No.	Course Code	Course Title	L	T	P	C
1	18CECEP8014	**Elective-IV**	3	0	0	3
2	18CECEP8025	**Elective –V**	3	0	0	3
3	18CECEP8036	**ElectiveVI**	3	0	0	3
4	18CECEP8047	**ElectiveVII**	3	0	0	3
5	18CECER8050	Project phase-II	0	0	12	07
6	18CECER8060	Co Curricular and Extra Curricular Activity (Mandatory Course)	3	0	0	0
Total Credits						19

Open Elective Courses offered by Dept. of CE to Other Depts.

1	18xxCEOxxxx	Civil Engineering Societal & Global Impact
2	18xxCEOxxxx	Introduction to Civil Engineering
3	18xxCEOxxxx	Disaster Management
4	18xxCEOxxxx	Environmental Pollution and Control
5	18xxCEOxxxx	Building Materials
6	18xxCEOxxxx	Green Buildings and Sustainability

Program Elective Course:

Elective	Title of the Subject
PEC-I	Foundation Engineering
	Architecture & Town Planning
	Structural Analysis by Matrix Methods
	Remote Sensing & GIS Applications
PEC-II	Transport of water and Waste Water
	Advanced Concrete Technology
	Surface Hydrology
	Offshore Engineering
PEC-III	Advanced Structural Analysis
	Advanced Transportation Engineering
	Earth Retaining Structures
	Rural Water Supply and Onsite Sanitation Systems
PEC-IV	Intelligent Transportation System
	Ground Improvement Techniques
	Environmental Impact Assessment And Environment Management Planning
	Engineering with Geo-Synthetics
PEC-V	Pre-Stressed Concrete
	Advanced Foundation Engineering
	Groundwater Development& Management
	Solid and hazardous waste management
PEC-VI	Air and Noise pollution and control
	Soil Dynamics and Machine Foundations
	Bridge Engineering
	Contracts management
PEC-VII	Repairs and Rehabilitation of Structures
	Wood Structures
	Transportation Economics
	Sustainable Construction Methods

M. Rama Rao

HoD

Head of the Dept - Civil
Sasi Institute of Technology & Engineering
TADEPALLIGUDEM - 534 101
W.G.Dist.,A.P.

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS SEMESTER - I			
Subject Code	18CMMSN1080	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			
COURSE OBJECTIVES: The objectives of this course help the students to 1. To provide basic information about Indian constitution. 2. To identify individual role and ethical responsibility towards society. 3. To understand human rights and its implications.			
Unit -1			
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.			**Hours – 10**
Unit -2			
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.			**Hours – 10**
Unit – 3			
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.			**Hours – 10**
Unit – 4			
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes			**Hours –10**

Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	
Unit – 5	
Lesson Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility.Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours – 10**
COURSE OUTCOMES: On completion of the course student will 1. Have general knowledge and legal literacy and thereby to take up competitive examinations. 2. Understand state and central policies, fundamental duties. 3. Understand Electoral Process, special provisions. 4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and 5. Understand Engineering ethics and responsibilities of Engineers 6. Understand Engineering Integrity & Reliability	
QUESTION PAPER PATTERN: **SECTION A:** 1. This section contains ten one answer questions carrying 1 mark each. 2. Two questions from each unit should present. **SECTION B:** 1. This section will have 5 questions with internal choice. 2. Each full question carries 12 marks. 3. Each full question will have sub question covering all topics under a unit.	
TEXT BOOKS: **Text Books:** 1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn.,	

2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:
1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics"**, Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources
1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

Course outcomes to Program outcomes mapping:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Course	-	-	-	-	-	3	-	5	-		-	-	-	-	-

APPROVED

ENVIRONMENTAL SCIENCE SEMESTER - II			
Subject Code	18CMCHN2080	Internal Marks	30
Number of Lecture Hours/Week	04	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -I	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the different	**Hours – 10**

ecosystems	
Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**Hours – 12**
Unit – 3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**Hours – 6**

Unit – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	**Hours – 12**
Unit – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems - pond, river, hill slopes, etc.	**Hours – 10**
COURSE OUTCOMES:	

On completion of the course student will be

1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Able to understand the concept of ecosystem and its diversity.
3. Able to gain knowledge on natural resources.
4. Able to understand the concept of biodiversity.
5. Able to gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

QUESTION PAPER PATTERN:

SECTION A:

1. This section contains ten one answer question carrying 1 mark each.
2. Two questions from each unit should present.

SECTION B:

1. This section will have 5 questions with internal choice.
2. Each full question carries 12 marks.
3. Each full question will have sub question covering all topics under a unit.

TEXT BOOKS:

1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi
3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.

2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. Environmental Studies, P.N. Paliniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

Course Outcomes to Program Outcomes Mapping:

CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-
6	-	3		-	-	-	-	-	-	-	-	-	-	-	-
Course	3	3	3	-	-	-	3	-	-	-	-	-	-	-	-

ENVIRONMENTAL ENGINEERING SEMESTER - IV			
Subject Code	18CECET4030	Internal Marks	30
Number of Lecture Hours/Week	03	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course Objectives:

This course will enable students to:

- Outline planning and the design of water supply systems for a community/town/city
- Provide knowledge of water quality requirement for domestic usage and other usage
- Impart understanding of importance of protection of water source quality
- Selection of valves and fixture in water distribution systems for water supply system.
- Impart knowledge on design of water distribution network

Unit -1 Introduction	**Hours**
Water:- Water Supply systems, Need for planned water supply schemes, Sources of Water, Water demand and Potable, industrial and agricultural water requirements. Role of Environmental Engineer.	8
Unit -2 Importance and Necessity of Protected Water Supply systems	
Importance and Necessity of Protected Water Supply systems, Water borne diseases, Flow chart of public water supply system, Agency activities Water Demand and Quantity Estimation: Estimation of water demand for a town or city, Per capita Demand and factors influencing it - Types of water demands and its variations- factors affecting water demand, Design Period, Factors affecting the Design period, Population Forecasting.	12

Unit – 3 Treatment of Water:	
Treatment of Water: Flowchart of water treatment plant, Treatment methods: Theory and Design of Sedimentation, Coagulation, Sedimentation with Coagulation, Filtration. Disinfection: Theory of disinfection-Chlorination and other Disinfection methods, Softening of Water, Removal of color and odours - Iron and manganese removal – Adsorption-fluoridation and deflouridation–aeration– Reverse Osmosis-Iron exchange–Ultra filtration	**10**
Unit – 4 Sewage	
Sewage- Domestic and Storm water, Quantity of Sewage, Sewage flow variations. Conveyance of sewage- Sewers, shapes design parameters, operation and maintenance of sewers, Sewage pumping; Sewerage, Sewer appurtenances, Design of sewerage systems. Storm Water- Quantification and design of Storm water; Sewage and Sullage, Pollution due to improper disposal of sewage, National River cleaning plans, recycling of sewage – quality requirements for various purposes.	**10**
Unit – 5 Building Plumbing	
Building Plumbing-Introduction to various types of home plumbing systems for water supply and waste water disposal, high rise building plumbing, Pressure reducing valves, Break pressure tanks, Storage tanks, Building drainage for high rise buildings, various kinds of fixtures and fittings used. Government authorities and their roles in water supply, sewerage disposal. Distribution of Water: Requirements- Methods of Distribution system, Layouts of Distribution networks, Pressures in the distribution layouts	**10**
Course outcomes: On completion of the course, student will be able to 1. Plan and design the water and distribution networks and sewerage systems 2. Identify the water source and select proper intake structure 3. Characterization of water	

4. Select the appropriate appurtenances in the water supply 5. Selection of suitable treatment flow for raw water treatments 6. Analyze the suitability of water distribution methods in various regions.
Question paper pattern: **Section A:** 1. This section contains ten one or two line answer question carrying 1 mark each. 2. Two questions from each unit should present. **Section B:** 1. This Section will have 10 questions, 2 from each unit 2. Each full question carry 12 marks. 3. Each full question will have sub question covering all topics under a unit. 4. The student will have to answer 5 full questions selecting one full question from each unit
Text Books: 1. Introduction to Environmental Engineering by P. Aarne Vesilind, Susan M. Morgan, Thompson / Brooks/Cole; Second Edition 2008 2. Introduction to Environmental Engineering, Vesilind, PWS Publishing Company 2000
Reference Books: 1. Water Supply and Sewerage, E.W. Steel 2. CPHEEO Manual on Water Supply & Treatment 3. Manual on Water Supply and Treatment, (latest Ed.), Ministry of Works & Housing, New Delhi. 4. Plumbing Engineering. Theory, design and Practice, S.M. Patil, 1999 5. Integrated Solid Waste Management, Tchobanoglous, Theissen & Vigil. McGraw Hill Publication 6. Environmental Engineering by H.S.Peavy, D.R. Rowe, G.Tchobanoglous; 1991, Tata-McGraw

Course Outcomes to Program Outcomes mapping:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
1	2	-	-	-	-	-	3	-	-	-	-	-	3	-	-
2	-	2	-	-	2	-	3	-	-	-	-	-	3	-	-
3	-	2	-	-	2	-	3	-	-	-	-	-	3	-	-
4	-	2	-	-	2	-	3	-	-	-	-	-	3	-	-
5	-	2	-	-	2	-	3	-	-	-	-	-	3	-	-
6	-	2	-	-	2	-	3	-	-	-	-	-	3	-	-
Course	-	**2**	-	-	**2**	-	3	-	-	-	-	-	**3**	-	-

APPROVED

ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT SEMESTER IV			
Subject Code	18CMMST4050	Internal Marks	30
Number of Lecture Hours/ Week	03	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course objectives:

This course will enable the students to

- Understand the concept and nature of Managerial Economics and Concept of Demand and Demand forecasting.
- Analyse the Cost Concepts, Cost-Volume-Profit Analysis and Market structures.
- Learn different Accounting Systems, preparation of Financial Statements and Capital Budgeting proposals by using different methods.

Unit -I	**Hours**
Introduction to Managerial Economics and demand Analysis: Definition of Managerial Economics and Scope-Managerial Economics and its relation with other subjects-Concept of Demand-Types-Determents-Law of Demand its Exception-Elasticity of Demand-Types and Measurement- Demand forecasting and its Methods.	10
Unit –II	
Production and Cost Analysis: Production function-Isoquants and Isocost-Law of Variable proportions- Cobb-Douglas Production function-Economics of Sale-Cost Concepts- Opportunity Cost-Fixed vs Variable Costs-Explicit Costs vs	10

Implicit Costs- Cost Volume Profit analysis- Determination of Break-Even Point	
Unit-III	
Introduction To Markets, Pricing Policies & forms Organizations and Business Cycles: Market Structures: Perfect Competition, Monopoly and Monopolistic and Oligopoly – Features – Price Output Determination – Methods of Pricing: Market Skimming Pricing, And Internet Pricing: Flat Rate Pricing. Features and Evaluation of Sole Trader – Partnership – Joint Stock Company – State/Public Enterprises and their forms – Business Cycles – Meaning and Features – Phases of Business Cycle	**12**
Unit –IV	
Introduction to Accounting & Financing Analysis: Introduction to Double Entry Systems – Preparation of Financial Statements- Analysis and Interpretation of Financial Statements-Ratio Analysis (Simple Problems)	**10**
Unit-V	
Capital and Capital Budgeting: Capital Budgeting: Meaning of Capital-Capitalization-Meaning of Capital Budgeting-Need for Capital Budgeting-Techniques of Capital Budgeting-Traditional and Modern Methods.	**08**
Course outcomes: On completion of the course student will be able to: 1. Equipped with the knowledge of managerial economics and estimating demand for a product. 2. Examine the Production Concept and familiar with the concepts of iso-quants, iso-cost lines and MRTS 3. Predict the cost of production and its relevance to managerial decision making 4. Differentiate various the Markets and Pricing methods along with Business Cycles.	

5. Prepare Financial Statements along with Analysis 6. Analyse and interpret various investment project proposals with the help of Capital Budgeting techniques.
Question paper pattern: **Section A:** 1. This section contains ten one or two line answer question carrying 1 mark each. 2. Two questions from each unit should present. **Section B:** 1. This Section will have 10 questions, 2 from each unit 2. Each full question carry 12 marks. 3. Each full question will have sub question covering all topics under a unit. 4. The student will have to answer 5 full questions selecting one full question from each unit
Text Books: 1. Dr. A. R. Aryasri – Managerial Economics and Financial Analysis, TMH 2011. 2. Dr. B. Kuberudu and Dr. T. V. Ramana: Managerial Economics & Financial Analysis, Himalaya Publishing House 2011.
Reference Books: 1. Dr. P. Vijaya Kumar & Dr. N. Apparao Management Science Cengage, Delhi, 2012. 2. S. A. Siddiqui & A. S. Siddiqui: Managerial Economics and Financial Analysis, New Age International Publishers, 2012 3. Vanitha Agarwal : Managerial Economics, Pearson Publications 2011.
Web References: 1. https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_MEFA_LECTURE_NOTES_1.pdf 2. https://www.edx.org/course/introduction-to-managerial-economics

Course Outcomes to Program Outcomes mapping:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
1	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
3	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Course	-	-	-	-	-	1	1	-	-	-	3	-	-	-	-

S.No.	Unit Name	Text Book /Reference	Chapter No.
1	Introduction to Managerial Economics and demand Analysis	T1	1,2,3 & 4
		T2	1,2,3 & 4
2	Production and Cost Analysis	T1	4,5,6 & 7
		T2	5,6,7,8 & 9
3	Introduction To Markets, Pricing Policies & forms Organizations and Business Cycles	T1	8 & 9
		T2	10,11,12,13 & 14
4	Introduction to Accounting & Financing Analysis	T1	13 & 14
		T2	16 &17
5	Capital and Capital Budgeting	T1	11&12
		T2	18

Biology for Engineers (Proposed syllabus for the academic year 2018 -2019) SEMESTER - III/I			
Subject Code	**18CMBIT5010**	IA Marks	30
Number of Lecture Hours/Week	2+1(T)	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
		Credits – 03	

Course Objectives:

- To convey that Biology is as important a scientific discipline as Mathematics, Physics and Chemistry
- To convey that classification per se is not what biology is all about. The underlying criterion, such as morphological, biochemical or ecological be highlighted.
- To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"
- To convey that all forms of life has the same building blocks and yet the manifestations are as diverse as one can imagine
- To convey that without catalysis life would not have existed on earth
- The molecular basis of coding and decoding genetic information is universal
- How to analyses biological processes at the reductionistic level
- The fundamental principles of energy transactions are the same in physical and biological world.

Unit -1 Introduction	
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology? Discuss how biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor. These examples will highlight the fundamental importance of	**Hours – 10**

observations in any scientific inquiry	
Unit -2 Classification	
Hierarchy of life forms at phenomenological level. A common thread weaves this hierarchy Classification. Discuss classification based on (a) cellularity- Unicellular or multicellular (b) ultra structure- prokaryotes or eucaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotropes (d) Ammonia excretion – aminotelic, uricoteliec, ureotelic (e) Habitata- acquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. A given organism can come under different category based on classification. Model organisms for the study of biology come from different groups. E.coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**Hours – 10**
Unit – 3 Genetics & Bio molecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** In this context discuss monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	**Hours – 10**
Unit – 4 Enzymes & Information Transfer Purpose	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions? Enzyme classification. Mechanism of enzyme action. Discuss at least two examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. Information Transfer Purpose: The molecular basis of coding and decoding genetic information is universal	**Hours – 10**

Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of genetic code. Define gene in terms of complementation and recombination	
Unit – 5 Microbiology & Metabolism	
Macromolecular analysis Purpose: How to analyses biological processes at the reductionistic level Proteins-structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. Thermodynamics as applied to biological systems. Exothermic and endothermic versus endergonic and exergoinc reactions. Concept of Keq and its relation to standard free energy. Spontaneity. ATP as an energy currency. This should include the breakdown of glucose to CO2 + H2O (Glycolysis and Krebs cycle) and synthesis of glucose from CO2 and H2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms**. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	**Hours – 10**
Course outcomes: On completion of this course, students are able to 1. Describe how biological observations of 18th Century that lead to major discoveries. 2. Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological 3. Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring 4. Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine 5. Classify enzymes and distinguish between different	

mechanisms of enzyme action.

(Note: Detailed Syllabus will be finalised after discussing with the Subject experts)

Question paper pattern:

Section A:

1. This section contains ten one or two line answer question carrying 1 mark each.
2. Two questions from each unit should present.

Section B:

1. This Section will have 10 questions.
2. Each full question carry 12 marks.
3. Each full question will have sub question covering all topics under a unit.

The student will have to answer 5 full questions selecting one full question from each unit.

TEXT BOOKS

1. Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M. L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
2. Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons

REFERENCES

1. Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
2. Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher

ENVIONMENTAL POLLUTION AND CONTROL			
Subject Code	18xxCEOxxxx	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course Objectives:

- Impart knowledge on fundamental aspects of air pollution & control, noise pollution, and solid waste management.
- Provide basic knowledge on sustainable development.
- Introduces some basics of sanitation methods essential for protection of community health.
- Differentiate the solid and hazardous waste based on characterization.

Unit -1 Introduction	
Air Pollution: Air pollution Control Methods–Particulate control devices – Methods of Controlling Gaseous Emissions – Air quality standards. **Noise Pollution**: Noise standards, Measurement and control methods – Reducing residential and industrial noise – ISO14000.	**Hours – 10**
Unit -2 Industrial wastewater Management	
Strategies for pollution control - Volume and Strength reduction – Neutralization – Equalization – Proportioning – Common Effluent Treatment Plants - Recirculation of industrial wastes – Effluent standards.	**Hours – 10**
Unit – 3 Solid Waste Management	
Solid waste characteristics – basics of on-site handling and collection – separation and processing - Incineration- Composting-Solid waste disposal methods – fundamentals of Land filling.	**Hours – 10**
Unit – 4 Environmental Sanitation	
Environmental Sanitation Methods for Hostels and Hotels, Hospitals, Swimming pools and public bathing places, social gatherings (melas and fares), Schools and Institutions, Rural Sanitation-low cost waste disposal methods.	**Hours – 10**
Unit-5 Hazardous Waste	
Characterization - Nuclear waste – Biomedical wastes – Electronic wastes - Chemical wastes – Treatment and management of hazardous waste-Disposal and Control methods.	**Hours – 10**

Course outcomes:

On completion of this course, students are able to

- Identify the air pollutant control devices
- Have knowledge on the NAAQ standards and air emission standards.
- Differentiate the treatment techniques used for sewage and industrial wastewater treatment methods.
- Understand the fundamentals of solid waste management, practices adopted in his town/village and its importance in keeping the health of the city.
- Appreciate the methods of environmental sanitation and the management of community facilities without spread of epidemics.

TEXT BOOKS

1. Environmental Engineering, by Ruth F. Weiner and Robin Matthews – 4th Edition Elesevier, 2003.
2. Environmental Science and Engineering by J.G. Henry and G.W. Heinke – Pearson Education.
3. Environmental Engineering by Mackenzie L Davis & David A Cornwell. McGraw Hill Publishing1. Air Pollution and Control by M.N. Rao & H.N. Rao

REFERENCES

1. Air Pollution and Control by M.N. Rao & H.N. Rao
2. Solid Waste Management by K. Sasi Kumar, S.A. Gopi Krishna. PHI New Delhi.
3. Environmental Engineering by Gerard Kiley, Tata McGraw Hill.
4. Environmental Sanitation by KVSG Murali Krishna, Reem Publications, New Delhi.

Hardware/Software Requirements:

1. Venturimeter setup.
2. Orifice meter setup.
3. Small orifice setup.
4. External mouthpiece setup.
5. Rectangular and Triangular notch setups.
6. Friction factor test setup.
7. Bernoulli's theorem setup
8. Impact of jets.
9. Hydraulic jump test setup.
10. Pelton wheel and Francis turbines.
11. Centrifugal and Reciprocating pumps

APPROVED

Syllabus- B.Tech VI Semester (Civil Engineering) For the Autonomous Batch starting from A.Y. 2018-19

PERSONALITY DEVELOPMENT & PROFRSSIONAL COMMUNICATION Effective from the academic year 2018-2019			
Subject Code	18CEEGT6010	**IA Marks**	30
Number of Lecture Hours/Week	02	**Exam Marks**	70
Total Number of	32	**Exam**	03

Lecture Hours		Hours	
Credits – 02			
Aim of the Course: Personality Development and Soft Skills course aims at equipping students with required skills such as personality development, interpersonal communication skills, career and employability skills, problem solving and professional communication skills to succeed in their personal and professional life as well to build a bright career with a clear understanding of their career values through experiential learning and performing several professional tasks. **Objectives:** By the end of the course students will be able to acquire the following skills: • Understand the process of Personality Development and learn effective methods of developing personality • Emotional Intelligence, and Intrapersonal skills • Career skills and Interview skills • Problem Solving skills • Professional Communication skills			
Training Methodology: The training methodology is designed to bring about changes in attitudes through experience-based learning. Activities in simulated environments such as role plays, group discussions, micro presentations, audio-video clippings, case studies, psychometric tests etc., will provide students insights into their strengths and areas for development. There will be a project work with problem analysis and presentation of the same.		**Teaching Hours** 32	

Course Contents: **UNIT –I** 1.**Personality Development** a) Personal Effectiveness- being proactive- principles of personal vision, b) Intrapersonal communication- emotional intelligence- beginning with the end in mind- c) Time management: understanding priorities- first things first- time – personal effectiveness	**5 hours**
UNIT –II **2. Emotional Intelligence and Intrapersonal Communication** a) Principles of Emotional Intelligence – b)Intrapersonal Communication- c) Principles of creative cooperation-organization skills-Think win-win d) Principles of balanced self-renewal- Lifelong learning	**5 hours**
UNIT –III **3. Career and Employability Skills** a) Understanding Career values- values grid-career thinking- what is a career? b) Skills vs strengths- spotting skills- reflecting on skills- setting goals for developing skills- c) Meeting the expectations of the employer- understanding job description- -Skills Grid exercises- matching the skills with requirements d) Preparing Resume and Preparing for interviews- Structuring interview questions- CAR- Context, Action and Results-	**6 hours**

UNIT –IV **4. Problem Solving Skills** a) Understanding the complexity at workplace- b) defining the problem- identifying the reasons- c) finding possible solutions- planning actions-analysing results-feedback d) redefining the problem- the problem solving cycle	**6 hours**
UNIT –V **5. Professional Communication** a) Active listening skills- note taking- b) Professional presentation skills- understanding the context- expectations of the people- putting across the message effectively- answering questions- c) Technical writing skills- practical steps for writing-report writing and writing a report free from plagiarism.	**10 hours**
Course outcomes: After studying this course, students will be able to: 1. Understand Personality development process and learn to implement effective techniques. 2. Understand how people behave and regulate self behaviours and learn to work in a team. 3. Know their career values, indentify their skills, set goals for enhancing their career skills and prepare for interviews 4. Understand and learn how to deal with problems and practice problem solving skills. 5. Learn the principles of professional communication & application of the same	
Question paper pattern: **Section A (20 marks)** 1. Ten questions carrying two mark each- 20 marks **Section B (50 marks)** 1. Five questions each carrying 10 marks	

Text Book

2. Dr. S.P. Dhanvel, English and Soft Skills, Orient Blackswan, 2011

Reference Books:

1. Seven Habits of Highly Effective People by Stephen R Covey
3. Professional Communication by Aruna Koneru, Mc Graw Hill
3. Personality Development and Soft Skills by Barun K Mitra OUP
4 Enhance Your Employability Skills-by David Winter and Laura Brammar, published by University of London -Open Courseware https://www.mooc-list.com/course/enhance-your-career and-employability-skills-coursera
5. R.S.Agarwal, Verbal & Non-verbal Reasoning, S. Chand& Co. Latest ed.,2003
6. Stay Hungry and Stay Foolish speech by Steve Jobs You Tube video

THEORY OF STRUCTURES-II (Proposed syllabus for the academic year 2018 -2019) SEMESTER - III/II			
Subject Code	18CECET6020	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
			Credits – 03

Course Objectives:

1. To give preliminary concepts of assessment of bending moment and shear force in Propped cantilevers, fixed

1·3·1
EEE

COURSE STRUCTURE AND DETAILED SYLLABUS

SITE 18 REGULATIONS

For

B.Tech.

Electrical and Electronics Engineering

With effective from the Academic Year

2018-19

I -B.Tech I- Semester Approved Course structure for the Academic Year 2018-2019 Common for ME/CE/EEE

SN	Subject Code	Subject title	L	T	P	C	I	E	T
1	18CMEGT1010	Technical English	3	1		4			
2	18CMMAT1020	Engineering Mathematics-I	3	1		4			
3	18CMCHT1030	Engineering Chemistry	2			2			
4	18CMEET1040	Basic Electrical Engineering	3	1		4			
5	18CMEGL1050	English Communication Lab			2	1			
6	18CMCHL1060	Engineering Chemistry Lab			3	1.5			
7	18CMEEL1070	Basic Electrical Engineering Lab			2	1			
8	18CMMSM1080	Constitution of India, Professional Ethics & Human Rights (MC)							
		Total	**11**	**3**	**7**	**17.5**			

I B.Tech II Semester Approved Course structure for the Academic Year 2018-2019 Common for ME/CE/EEE

SN	Subject Code	Subject title	L	T	P	C	I	E	T
1	18CMMAT2010	Engineering Mathematics II	3	1		4			
2	18EEPHT2020	Engineering Physics	3	1		4			
3	18CMCST2030	Programming for Problem solving	3	0		3			
4	18CMMEL2040	Engineering Graphics	1		4	3			
5	18EEPHL2050	Engineering Physics Lab			3	1.5			
6	18CMCSL2060	Programming for Problem solving Lab			4	2			
7	18CMMEL2070	Work Shop/Manufacturing practice	1		4	3			
8	18CMCHN2080	Environmental Science (MC)							
		Total	**11**	**2**	**15**	**20.5**			

II -B.Tech EEE I- Semester Approved Course structure for the Academic Year 2018-2019

SN	Subject Code	Subject title	L	T	P	C	I	E	T
1	18CMMAT3010	Engineering Mathematics III	3	1		4			
2	18EEEET3020	Analog Electronics	3			3			
3	18EEEET3030	Electromagnetic fields	3	1		4			
4	18EEEET3040	Electrical Circuit Analysis	3	1		4			
5	18EEEET3050	Electrical Machines I	3			3			
6	18EEEEL3060	Analog Electronics Lab			3	1.5			
7	18EEEEL3070	Electrical Circuit Analysis Lab			3	1.5			
8	18EEEEL3080	Electrical Machines I Lab			3	1.5			
		Total	**15**	**3**	**9**	**22.5**			

II B.Tech EEE II Semester Approved Course structure for the Academic Year 2018-2019

SN	Subject Code	Subject title	L	T	P	C	I	E	T
1	18EEEET4010	Signals & Systems	3			3			
2	18CMMET4020	Engineering Mechanics	3	1		4			
3	18EEEET4030	Digital Electronics	3			3			
4	18EEEET4040	Control Systems	3			3			
5	18EEEET4050	Electrical Machines II	3			3			
6	18EEEEL4060	Digital Electronics Lab			3	1.5			
7	18EEEEL4070	Control Systems Lab			3	1.5			
8	18EEEEL4080	Electrical Machines II Lab			3	1.5			
		Total	**14**	**1**	**9**	**20.5**			

III -B.Tech EEE I- Semester Approved Course structure for the Academic Year 2018-2019

SN	Subject Code	Subject title	L	T	P	C	I	E	T
1	18EEEET5010	Microprocessors	3			3			
2	18EEEET5020	Power Systems – I (Apparatus and Modeling)	3			3			
3	18CMMST5030	Management Science	3			3			
4	18EEEET5040	Power Electronics	3			3			
5	18EEXXO5051	Open Elective – 1	3			3			
6	18EEEEL5060	Microprocessors Lab			3	1.5			
7	18EEEEL5070	Power Systems-I Lab			3	1.5			
8	18EEEEL5080	Power Electronics Lab			3	1.5			
		Total	**15**		**9**	**19.5**			

III B.Tech EEE II Semester Approved Course structure for the Academic Year 2018-2019

SN	Subject Code	Subject title	L	T	P	C	I	E	T
1	18CMBIT6010	Biology for Engineers	3			3			
2	18CMEGT6020	Personality Development & Professional Communication	2			2			
3	18EEEET6030	Power Systems – II (Operation and Control)	3			3			
4	18EEEET6040	Electrical Measurements & Instrumentation	3			3			
5	18CMMST6050	Engineering Economics and Financial management	3			3			
6	18EEEEP606X	Program Elective - 1	3			3			
7	18EEEEL6070	Power Systems – II Lab			3	1.5			
8	18EEEEL6080	Measurements and Instrumentation Lab			3	1.5			
9	18EEEEC6090	Term Paper with Seminar				2			
		Total	**16**		**6**	**21**			

Program Elective – 1

18EEEEP6061	Line Commutated and Active Rectifiers
18EEEEP6062	HVDC Transmission Systems
18EEEEP6063	Control Systems Design

IV –B.Tech EEE I- Semester Approved Course structure for the Academic Year 2018-2019

SN	Subject Code	Subject title	L	T	P	C	I	E	T
1	18EEEET7010	Power System Protection	3			3			
2	18EEEEP702X	Program Elective -2	3			3			
3	18EEEEP703X	Program Elective -3	3			3			
4	18EEEEO7042	Open Elective-2	3			3			
5	18EEEEO7053	Open Elective-3	3			3			
6	18EEEEL7060	Electronics Design Lab			3	1.5			
7	18EEEER7070	Project Phase-I			8	4			
8	18EEEEC7080	Industry Internship (During summer vacation)				2			
		Total	**15**		**11**	**22.5**			

Program Elective – 2

18EEEEP7021	Electrical Drives
18EEEEP7022	Smart Grid
18EEEEP7023	Optimization Techniques

Program Elective – 3

18EEEEP7031	Electrical and Hybrid Vehicles
18EEEEP7032	Power System Dynamics and Stability
18EEEEP7033	Digital signal Processing

IV B.Tech EEE II Semester Approved Course structure for the Academic Year 2018-2019

SN	Subject Code	Subject title	L	T	P	C	I	E	T
1	18EEEEP801X	Program Elective -4	3			3			
2	18EEEEP802X	Program Elective -5	3			3			
3	18EEEEO8034	Open Elective-4	3			3			
4	18EEEER8040	Project Phase-II			14	7			
		Total	9		14	16			

Program Elective – 4

18EEEEP8011	Advanced Electric Drives
18EEEEP8012	Electrical Energy Conservation And Auditing
18EEEEP8013	Intelligent Control & Its Applications

Program Elective – 5

18EEEEP8021	FACTS
18EEEEP8022	Power Quality
18EEEEP8023	Digital Control Systems

Open Electives offered by EEE department

SN	Subject Code	Subject title	L	T	P	C
1	18XXEEOM0XA	Control system design	3			3
2	18XXEEOM0XB	Optimization techniques	3			3
3	18XXEEOM0XC	Wind and Solar Energy Systems	3			3
4	18XXEEOM0XD	Electrical and Hybrid Vehicles	3			3
5	18XXEEOM0XE	Intelligent control & its applications	3			3
6	18XXEEOM0XF	Digital Signal Processing	3			3
7	18XXEEOM0XG	Electrical materials	3			3
8	18XXEEOM0XH	Digital Control Systems	3			3
9	18XXEEOM0XI	Industrial Electrical Systems	3			3
10	18XXEEOM0XJ	Advanced Control Systems	3			3
		Total	**12**			**12**

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS

Common to all

Subject Code	18CMMSN1080	IA Marks	30
Number of Lecture Hours/Week	3+1(T)	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 00

COURSE OBJECTIVES:

The objectives of this course help the students to

- To provide basic information about Indian constitution.
- To identify individual role and ethical responsibility towards society.
- To understand human rights and its implications.

Unit -1	
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours– 10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours– 10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th&91st Amendments.	**Hours– 10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchayats and Co - Operative Societies.	**Hours–10**
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours– 10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity &Reliability

Question paper pattern:

1. Question paper consists of 10 questions.
2. Each full question carrying 14 marks.
3. Each full question will have sub question covering all topics under a unit.
4. The student will have to answer 5 full questions selecting one full question from each unit.

Text Books:

1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice –Hall EEE, 19th / 20thEdn.,2001
2. Charles E. Haries, Michael S Pritchard and Michael J.Robins**"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing,2002.
2. M. Govindarajan, S. Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi,2004
3. Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi,2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources

1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

COURSE OUTCOMESTOPROGRAMOUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Course	-	-	-	-	-	3	-	5	-		-	-	-	-	-

ENVIRONMENTAL SCIENCE SEMESTER - II			
Subject Code	18CMCHN2080	Internal Marks	30
Number of Lecture Hours/Week	04	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the different ecosystems	Hours – 10

Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**Hours – 12**
Unit – 3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**Hours – 6**
Unit – 4	

ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution	**Hours – 12**
d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	
Unit – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems - pond, river, hill slopes, etc.	**Hours – 10**

COURSE OUTCOMES:

On completion of the course student will be

1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Able to understand the concept of ecosystem and its diversity.
3. Able to gain knowledge on natural resources.
4. Able to understand the concept of biodiversity.
5. Able to gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Question Paper Pattern:

1. Question paper contains 10 Questions, 2 from each course outcome.
2. The student must answer 5 full questions by selecting one question from each course outcome (Internal Choice)
3. All questions carries 14 marks each
4. Each full question will have sub question covering all topics under a course outcome

TEXT BOOKS:

1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi
3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Unit -1: Introduction	Hours
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	08
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	08
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	12
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	12

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genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge Concept of single celled organisms. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm. C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

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PERSONALITY DEVELOPMENT & PROFESSIONAL COMMUNICATION			
Subject Code	18CMEGT5020	IA Marks	30
Number of Lecture Hours Week	2	Exam Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Credits – 02			

Unit -1: Personality Development	Hours
a) Personal Effectiveness- being proactive- principles of personal vision, b) Intrapersonal communication- emotional intelligence- beginning with the end in mind- c) Time management: understanding priorities- first things first- time – personal effectiveness	05
Unit -2: Emotional Intelligence and Intrapersonal Communication	
a) Principles of Emotional Intelligence – b) Intrapersonal Communication- c) Principles of creative cooperation-organization skills-Think win-win d) Principles of balanced self-renewal- Lifelong learning	05
Unit – 3:Career and Employability Skills	
a) Understanding Career values- values grid-career thinking- what is a career? b) Skills vs strengths- spotting skills- reflecting on skills- setting goals for developing skills- c) Meeting the expectations of the employer-understanding job description- Skills Grid exercises- matching the skills with requirements d) Preparing Resume and Preparing for interviews- Structuring interview questions- CAR- Context, Action and Results	06
Unit – 4:Problem Solving Skills	
a) Understanding the complexity at workplace- b) defining the problem- identifying the reasons- c) finding possible solutions- planning actions- analyzing results- feedback d) redefining the problem- the problem solving cycle	06
Unit – 5:Professional Communication	
a) Active listening skills- note taking- b) Professional presentation skills- understanding the context- expectations of the people- putting across the message effectively- answering questions- c) Technical writing skills- practical steps for writing- report writing and writing a report free from plagiarism.	10

Text(T) / Reference(R) Books:	
T1	English and Soft Skills, Dr. S.P. Dhanvel, Orient Blackswan, 2011
R1	Seven Habits of Highly Effective People, Stephen R Covey
R2	Professional Communication, ArunaKoneru, Mc Graw Hill
R3	Personality Development and Soft Skills, Barun K Mitra OUP
R4	Enhance Your Employability Skills, David Winter and Laura Brammar, University of London.
W1	https://www.coursera.org/browse/personal-development
W2	https://alison.com/courses/personal-development

Course Outcomes: On completion of this course, students can	
CO1	Understand Personality development process and learn to implement effective techniques.
CO2	Understand how people behave and regulate self-behaviors and learn to work in a team.
CO3	Know their career values, identify their skills, set goals for enhancing their career skills and prepare for interviews
CO4	Understand and learn how to deal with problems and practice problem solving skills.
CO5	Learn the principles of professional communication & application of the same

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO2	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO3	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO4	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO5	-	-	-	-	-	-	-	2	-	3	-	2	-	-
Course	-	-	-	-	-	-	-	2	-	3	-	2	-	-

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ME

COURSE STRUCTURE AND SYLLABUS

SITE-18 REGULATIONS

For

B. Tech.

Mechanical Engineering

With effective from the Academic Year

2018-19

sasi INSTITUTE OF TECHNOLOGY & ENGINEERING
autonomous
Accredited by NAAC with "A" Grade
Recognised by UGC under section 2(f) &12(B)
Approved by AICTE - NEW Delhi
Permanently Affiliated to JNTUK, SBTET
Ranked as "A" Grade by Govt. of A.P.
Department of Mechanical Engineering

Course structure for the Academic Year 2018-19

B. Tech. (Mechanical Engineering)
Semester I (First Year)

Sl. No.	Course Code	Course Title	L	T	P	C
1.	18CMEGT1010	Technical English	2			3
2.	18CMMAT1020	Engineering Mathematics-I	3	1		4
3.	18CMCHT1030	Engineering Chemistry	3	1		4
4.	18CMEET1040	Basic Electrical Engineering	3	1		4
5.	18CMEGL1050	English Communication skills lab			2	1
6.	18CMCHL1060	Engineering Chemistry Lab			3	1.5
7.	18CMEEL1070	Basic Electrical Engineering Lab			2	1.5
8.	18CMMSN1080	Constitution of India, Professional Ethics & Human Rights				
Total			**11**	**03**	**07**	**19**

B.Tech. (Mechanical Engineering)

Semester II (First Year)

Sl. No.	Course Code	Course Title	L	T	P	C
1.	18CMMAT2010	Engineering Mathematics-II	3	1		4
2.	18MEPHT2020	Engineering Physics	3	1		4
3.	18CMCST2030	Programming for Problem Solving	3	0		3
4.	18CMMEL2040	Engineering Graphics	1		4	3
5.	18MEPHL2050	Engineering Physics Lab			3	1.5
6.	18CMCSL2060	Programming for Problem Solving lab			4	2
7.	18CMMEL2070	Work Shop/Manufacturing Practice	1		4	1.5
8.	18CMCHN2080	Environmental Science				
Total			**11**	**02**	**15**	**19**

B.Tech. (Mechanical Engineering)

Semester III (Second Year)

Sl. No.	Course Code	Course Title	L	T	P	C
1.	18CMMAT3010	Engineering Mathematics-III	3	1		4
2.	18MEMET3020	Engineering Mechanics	3	1		4
3.	18MEECT3030	Basic Electronics Engg.	3	0		3
4.	18MEMET3040	Manufacturing Processes	3	0		3
5.	18MEMET3050	Thermodynamics	3			3
6.	18MEMET3060	Materials Engineering	3			3
7.	18MEMEL3070	Manufacturing Processes Lab			3	1.5
8.	18MEMEL3080	CAEDP Lab			3	1.5
Total			**15**	**2**	**06**	**23**

B.Tech. (Mechanical Engineering)

Semester IV (Second year)

Sl. No.	Course Code	Course Title	L	T	P	C
1.	18MEMET4010	Strength of Materials	3			3
2.	18MEMET4020	Fluid Mechanics & Fluid Machines	3			3
3.	18MEMET4030	Theory of Machines-I	3			3
4.	18MEMET4040	Applied Thermodynamics	3			3
5.	18CMMST4050	Engg. Economics & Financial Management	3			3
6.	18MEMEL4060	Fluid Mechanics & Fluid Machines Lab			3	1.5
7.	18MEMEL4070	Mechanics of Solids & Materials Lab			3	1.5
8.	18MEMEN4080	Machine Drawing Lab				
Total			**14**	**01**	**06**	**18**

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Department of Mechanical Engineering

B.Tech. (Mechanical Engineering)

Semester V (Third year)

Sl. No.	Course Code	Course Title	L	T	P	C
1.	18CMBIT5010	Biology for Engineers	2	1		3
2.	18MEMET5020	Manufacturing Technology	3			3
3.	18MEMET5030	Design of Machine Elements	3			3
4.	18MEMET5040	Heat Transfer	3			3
5.	18MEXXO505X	Open Elective-I	3			3
6.	18MEMEL5060	Heat Transfer Lab			3	1.5
7.	18MEMEL5070	Manufacturing Technology & Metrology Lab			4	2
8.	18MEMEC5080	Term Paper with Seminar			4	2
Total			**15**		**10**	**20.5**

B.Tech. (Mechanical Engineering)

Semester VI (Third year)

Sl. No.	Course Code	Course Title	L	T	P	C
1.	18MEMET6010	Theory of Machines-II	3			3
2.	18CMEGT6020	Personality Development & Professional Communication	2			2
3.	18MEMEP603X	Elective-I	3			3
4.	18MEMEP604X	Elective-II	3			3
5.	18MEXXO605X	Open Elective-II	3			3
6.	18MEMEL6060	Theory of Machines Lab			3	1.5
7.	18MEMEL6070	Thermal Engineering Lab			3	1.5
8.	18MEMEL6080	Modelling & Simulation Lab			4	2
9.	18MEMEN6090	Design of Transmission Systems				
Total			**14**		**10**	**19**

B.Tech. (Mechanical Engineering)

Semester VII (Fourth Year)

Sl. No.	Course Code	Course Title	L	T	P	C
1.	18MEMET7010	Operation Research	3			3
2.	18MEMET7020	Instrumentation & Control Systems	3			3
3.	18MEMEP703X	Elective-III	3			3
4.	18MEMEP704X	Elective-IV	3			3
5.	18MEXXO705X	Open Elective-III	3			3
6.	18MEMEL7060	Instrumentation Lab			3	1.5
7.	18MEMEC7070	Internship with Seminar			4	2
8.	18MEMER7080	Project Phase-I			8	4
Total			**15**		**15**	**22.5**

B.Tech. (Mechanical Engineering)

Semester VIII (Fourth Year)

Sl. No.	Course Code	Course Title	L	T	P	C
1.	18MEMET8010	Automation in Manufacturing	3			3
2.	18MEMEP802X	Elective-V	3			3
3.	18MEMEP803X	Elective-VI	3			3
4.	18MEMEO804X	Open Elective-IV	3			3
5.	18MEMER805X	Project Phase-II			14	7
6.	18MEMCN8060	Co Curricular and Extra Curricular Activity (Mandatory Course)	3			
		Total	**12**		**14**	**19**

Program Elective Courses:

	Course Code	Course Title
Elective -I	18MEMEP603A	1. Composite Materials
	18MEMEP603B	2.Un-Conventional Machining Processes
	18MEMEP603C	3. Internal Combustion Engines
Elective -II	18MEMEP604A	1. Power Plant Engineering
	18MEMEP604B	2. CAD/CAM
	18MEMEP604C	3. Design for Manufacture
Elective -III	18MEMEP703A	1.Gas Dynamics & Jet Propulsion
	18MEMEP703B	2. Finite Element Methods
	18MEMEP703C	3 Flexible Manufacturing Systems
Elective -IV	18MEMEP704A	1. Automobile Engineering
	18MEMEP704B	2.Mechatronics
	18MEMEP704C	3.Additive Manufacturing
Elective -V	18MEMEP802A	1.Energy Conservation & Management
	18MEMEP802B	2.Non Destructive Evaluation
	18MEMEP802C	3. Solid Mechanics
Elective -VI	18MEMEP803A	1. Refrigeration and Air Conditioning
	18MEMEP803B	2. Computational Fluid Dynamics
	18MEMEP803C	3.Quality & Reliability Engineering

Open Elective Courses offered by Dept. of ME to Other Depts.

S. No.	Course Title	Course Code
1	Operations Research	18MEXXON0MA
2	Robotics	18MEXXON0MB
3	Advanced Optimization Techniques	18MEXXON0MC
4	Green Engineering Systems	18MEXXON0MD
5	Production Planning and Control	18MEXXON0ME
6	Nano Technology	18MEXXON0MF

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS Common to all branches SEMESTER-II			
Subject Code	18CMMSN2080	IA Marks	30
Number of Lecture Hours/Week	3+1(T)	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

- To provide basic information about Indian constitution.
- To identify individual role and ethical responsibility towards society.
- To understand human rights and its implications.

Unit -1	**Hours**
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th&91st Amendments.	**10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchayats and Co - Operative Societies.	**10**
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies.
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity &Reliability

Question paper pattern:

1. Question paper consists of 10 questions.
2. Each full question carrying 14 marks.
3. Each full question will have sub question covering all topics under a unit.
4. The student will have to answer 5 full questions selecting one full question from each unit.

Text Books:

1. Durga Das Basu: "Introduction to the Constitution on India", (Students Edn.) Prentice –Hall

EEE, 19th / 20thEdn.,2001

2. Charles E. Haries, Michael S Pritchard and Michael J.Robins"Engineering Ethics" Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing,2002.
2. M. Govindarajan, S. Natarajan, V.S.Senthilkumar, "Engineering Ethics", Prentice – Hall of India Pvt. Ltd. New Delhi,2004
3. Brij Kishore Sharma," Introduction to the Constitution of India", PHI Learning Pvt. Ltd., New Delhi,2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources

1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

COURSE OUTCOMESTOPROGRAMOUTCOMES MAPPING:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Course	-	-	-	-	-	3	-	5	-		-	-	-	-	-

ENVIRONMENTAL SCIENCE SEMESTER - II			
Subject Code	18CMCHN2080	Internal Marks	30
Number of Lecture Hours/Week	04	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the different	**Hours – 10**

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ecosystems	
Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**Hours – 12**
Unit – 3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**Hours – 6**

APPROVED

Unit – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	**Hours – 12**
Unit – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems - pond, river, hill slopes, etc.	**Hours – 10**
COURSE OUTCOMES:	

APPROVED

On completion of the course student will be

1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Able to understand the concept of ecosystem and its diversity.
3. Able to gain knowledge on natural resources.
4. Able to understand the concept of biodiversity.
5. Able to gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

QUESTION PAPER PATTERN:

SECTION A:

1. This section contains ten one answer question carrying 1 mark each.
2. Two questions from each unit should present.

SECTION B:

1. This section will have 5 questions with internal choice.
2. Each full question carries 12 marks.
3. Each full question will have sub question covering all topics under a unit.

TEXT BOOKS:

1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi
3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.

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2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. Environmental Studies, P.N. Paliniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

Course Outcomes to Program Outcomes Mapping:

CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-
6	-	3		-	-	-	-	-	-	-	-	-	-	-	-
Course	3	3	3	-	-	-	3	-	-	-	-	-	-	-	-

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Permanently Affiliated to JNTUK, SBTET
Ranked as "A" Grade by Govt. of A.P.
Department of Mechanical Engineering

B.Tech. (Mechanical Engineering)

V Semester (Third Year)

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of LectureHours/Week	2+1(T)	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course Objectives: Students should be able to:

1. Convey that Biology is as important as scientific discipline as Mathematics, Physics and Chemistry
2. Convey that classification per se is not what biology is all about. The underlying criterion, such as morphological, biochemical or ecological be highlighted.
3. Convey that "Genetics is to biology what Newton's laws are to Physical Sciences"
4. Convey that all forms of life has the same building blocks and yet the manifestations are as diverse as one can imagine
5. Convey that without catalysis life would not have existed on earth
6. molecular basis of coding and decoding genetic information is universal
7. Analyse biological processes at the reductionist level
8. The fundamental principles of energy transactions are the same in physical and biological world.

Unit -1 Introduction	**Teaching Hours**
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor.	**Hours – 8**
Unit -2 Classification	
Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra structure- prokaryotes or eucaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotropes (d) Ammonia excretion – aminotelic, uricoteliec, ureotelic (e) Habitata- acquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E.coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**Hours – 8**
Unit – 3 Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to	**Hours–12**

genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	
Unit – 4 Enzymes & Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of genetic code. Define gene in terms of complementation and recombination	**Hours–12**
Unit – 5 Microbiology & Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms**. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	**Hours–10**
Course outcomes: Students will be able to 1. Describe how biological observations of 18th Century that lead to major discoveries. 2. Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological 3. Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring 4. Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine 5. Classify enzymes and distinguish between different mechanisms of enzyme action. 6. Convey that "Genetics is to biology what Newton's laws are to Physical Sciences"	
Question paper pattern: **Section A:** 1. This section contains ten one or two line answer questions carrying 1 mark each. 2. Two questions from each unit will be set. **Section B:** 1. This Section will have 05 questions with internal choice. 2. Each full question carries 12 marks. 3. Each full question comprises sub question covering all topics under a unit.	
TEXT BOOKS 1. Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.;	

Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
2. Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
3. Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers

REFERENCES

1. Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
2. Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher

WEB SOURCE REFERENCES:

COs VS POs MAPPING (DETAILED; HIGH: 3; MEDIUM: 2; LOW: 1)**:**

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
1						3	2						1	
2						2	3						2	
3	1					3							1	
4	3						2						1	
5	2					3							1	
6	3					3	3						1	
Overall	1					3	2						1	

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Department of Mechanical Engineering

B.Tech (Mechanical Engineering)
VI Semester (Third Year)

Personality Development & Professional Communication			
Subject Code	18CMEGT6020	**IA Marks**	30
Number of Lecture Hours/Week	02	**Exam Marks**	70
Total Number of Lecture Hours	32	**Exam Hours**	03
Credits – 02			

Aim of the Course:

Personality Development and Professional Communication skills course aims at equipping students with required skills such as personality development, interpersonal communication skills, career and employability skills, problem solving, and professional communication skills to succeed in their personal and professional life as well as to build a bright career with a clear understanding of their career values through experiential learning and performing several professional tasks.

Objectives: By the end of the course students will be able to acquire the following skills:

- Understand the process of Personality Development and learn effective methods of developing personality
- Emotional Intelligence, and Intrapersonal skills
- Career skills, Interview skills and Employability Skills
- Problem Solving skills
- Professional Communication skills

	Teaching Hours
Training Methodology: The training methodology is designed to bring about changes in attitudes through experience-based learning. Activities in simulated environments such as role plays, group discussions, micro presentations, audio-video clippings, case studies, psychometric tests, etc. will provide students insights into their strengths and areas for development. There will be a project work with problem analysis and presentation of the same.	**Hours-32**
Course Contents: **UNIT –I** 1.**Personality Development** a) Personal Effectiveness- being proactive- principles of personal vision, b) Intrapersonal communication- emotional intelligence- beginning with the end in mind- c) Time management: understanding priorities- first things first- time – personal effectiveness	**Hours-5**

UNIT –II **2. Emotional Intelligence and Intrapersonal Communication** a) Principles of Emotional Intelligence – b)Intrapersonal Communication- c) Principles of creative cooperation-organization skills-Think win-win d) Principles of balanced self-renewal- Lifelong learning	**Hours-5**
UNIT –III **3. Career and Employability Skills** a) Understanding Career values- values grid-career thinking- what is a career? b) Skills vs strengths- spotting skills- reflecting on skills- setting goals for developing skills- c) Meeting the expectations of the employer-understanding job description- - Skills Grid exercises- matching the skills with requirements d) Preparing Resume and Preparing for interviews- Structuring interview questions- CAR- Context, Action and Results-	**Hours-6**
UNIT –IV **4. Problem Solving Skills** a) Understanding the complexity at workplace- b) defining the problem- identifying the reasons- c) finding possible solutions- planning actions- analysing results-feedback d) redefining the problem- the problem solving cycle	**Hours-6**
UNIT –V **5. Professional Communication** a) Active listening skills- note taking- b) Professional presentation skills- understanding the context- expectations of the people- putting across the message effectively- answering questions- c) Technical writing skills- practical steps for writing- report writing and writing a report free from plagiarism.	**Hours-10**
Course outcomes: After studying this course, students will be able to: 1. Understand Personality development process and learn to implement effective techniques. 2. Understand how people behave and regulate self behaviours and learn to work in a team. 3. Know their career values, indentify their skills, set goals for enhancing their career skills 4. Understand and learn how to deal with problems and practice problem solving skills. 5. Learn the principles of professional communication & application of the same 6. Face job interviews confidently and work a team effectively	
Question paper pattern: **Section A:** 1. This section contains ten one or two line answer questions carrying 1 mark each. 2. Two questions from each unit will be set. **Section B:** 1. This Section will have 05 questions with internal choice. 2. Each full question carries 12 marks. 3. Each full question comprises sub question covering all topics under a unit.	

Text Book

1. Dr. S.P. Dhanvel, English and Soft Skills, Orient Blackswan, 2011

Reference Books:

1. Seven Habits of Highly Effective People by Stephen R Covey
2. Professional Communication by Aruna Koneru, Mc Graw Hill
3. Personality Development and Soft Skills by Barun K Mitra OUP
4. Enhance Your Employability Skills-by David Winter and Laura Brammar, published by
5. University of London -Open Courseware
6. R.S.Agarwal, Verbal & Non-verbal Reasoning, S. Chand& Co. Latest ed.,2003
7. Stay Hungry and Stay Foolish speech by Steve Jobs You Tube video7.

Web Sources:

1. https://www.mooc-list.com/course/enhance-your-career-and-employability-skills-coursera
2. https://www.mindtools.com/

COs VS POs MAPPING (DETAILED; HIGH:3; MEDIUM:2; LOW:1):

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2
1										2	2			
2									3	2				
3										2	2			
4											2	2		
5										3				
6									2	2				
Overall									3	3	2	2		

Unit	Unit Title	Text books/Reference Books	Chapter Number
I	Personality Development	Text Book 1 Reference Book 1	1,2,3 Part 2
II	Interpersonal Communication Skills	Text Book 1 Reference Book 1 Reference Book 2	2,4, and 8 Part 3 2 and 3
III	Career and Employability Skills	Text Book 1 Reference Book 4	7 4
IV	Problem Solving Skills	Text Book Reference Book 5	6 7
V	Professional Communication	Text Book 1 Reference Book 2	8, and 10 3and 4

Course Structure

SITE18 Regulations

For

B.Tech.

in

Electronics and Communication Engineering

With effective from the academic year 2018-19

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Department of Electronics & Communication Engineering

Course structure for SITE18 Regulations

B.Tech. (Electronics & Communication Engineering)

Semester I (First year)

S.No	Course Code	Course Title	L	T	P	C
1	18CMMAT1010	Engineering Mathematics-I	3	1	0	4
2	18ECPHT1020	Engineering Physics	3	1	0	4
3	18CMCST1030	Programming for problem solving	3	0	0	3
4	18CMMEL1040	Engineering Graphics	1	0	4	3
5	18ECPHL1050	Engineering Physics Lab	0	0	3	1.5
6	18CMCSL1060	Programming for problem solving lab	0	0	4	2
7	18CMMEL1070	Work Shop/Manufacturing practice	0	0	3	1.5
8	18CMMEL1080	Environmental Science (Non -Credit course)	0	0	0	0
					Total Credits	**19**

Semester II (First year)

S.No	Course Code	Course Title	L	T	P	C
1	18CMEGT2010	Technical English	3	0	0	3
2	18CMMAT2020	Engineering Mathematics II	3	1	0	4
3	18CMCHT2030	Engineering Chemistry	3	1	0	4
4	18CMEET2040	Basic Electrical Engineering	3	1	0	4
5	18CMEGL2050	English Communication skills lab	0	0	2	1
6	18CMCHL2060	Engineering Chemistry Lab	0	0	3	1.5
7	18CMEEL2070	Basic Electrical Engineering Lab	0	0	3	1.5
8	18CMMSN2080	Constitution of India, Professional Ethics & Human Rights (MC)	0	0	0	0
					Total Credits	**19**

Semester III (Second year)

S.No	Course Code	Course Title	L	T	P	C
1	18CMMAT3010	Engineering Mathematics-III	3	1	0	4
2	18ECECT3020	Electronic Devices	3	0	0	3
3	18ECECT3030	Network Theory	3	0	0	3
4	18ECECT3040	Signals & Systems	3	0	0	3
5	18ECECT3050	Probability & Stochastic Processes	3	0	0	3
6	18ECECL3060	Electronic Devices Lab	0	0	3	1.5
7	18ECECL3070	Network Theory Lab	0	0	3	1.5
8	18ECECN3080	Pulse & Digital Circuits (MC)	3	0	0	0
					Total Credits	**19**

Semester IV (Second year)

S.No	Course Code	Course Title	L	T	P	C
1	18ECECT4010	Digital System Design	3	0	0	3
2	18CMMET4020	Engineering Mechanics	3	1	0	4
3	18ECECT4030	Electro Magnetic Waves & Transmission Lines	3	0	0	3
4	18ECECT4040	Analog Circuits	3	0	0	3
5	18ECECT4050	Analog & Digital Communications	3	0	0	3
6	18ECECL4060	Digital System Design Lab	0	0	3	1.5
7	18ECECL4070	Analog Circuits Lab	0	0	3	1.5
8	18ECECL4080	Analog & Digital Communications Lab	0	0	3	1.5
					Total Credits	**20.5**

Semester V (Third year)

S.No	Course Code	Course Title	L	T	P	C
1	18ECECT5010	Control Systems	3	0	0	3
2	18CMEGT5020	Personality Development & Professional Communication	2	0	0	2
3	18CMMST5030	Management Science	3	0	0	3
4	18ECECT5040	Micro Processors & Micro Controllers	3	0	0	3
5	18ECECT5050	Digital Signal Processing	3	0	0	3
6	18ECECL5060	Micro Processors & Micro Controllers Lab	0	0	3	1.5
7	18ECECL5070	Digital Signal Processing Lab	0	0	3	1.5
8	18ECECR5080	Term Paper with Seminar	2	0	0	2
					Total Credits	**19**

Semester VI (Third year)

S.No	Course Code	Course Title	L	T	P	C
1	18CMBIT6010	Biology for Engineers	3	0	0	3
2	18ECECT6020	Computer Architectures & Organization	3	0	0	3
3	18ECECP603X	Program Elective-1	3	0	0	3
4	18ECECP604X	Program Elective-2	3	0	0	3
5	18CMMST6050	Engineering Economics and Financial Management	3	0	0	3
6	18ECECT6060	Computer Networks	3	0	0	3
7	18ECECL6070	Computer Networks Lab	0	0	3	1.5
8	18ECECL6080	Electronic Design Workshop	0	0	4	2
					Total Credits	**21.5**

Semester VII (Fourth year)

S.No	Course Code	Course Title	L	T	P	C
1	18ECECT7010	Electronic Measurements & Instrumentation	3	0	0	3
2	18ECECP702X	Program Elective-3	3	0	0	3
3	18ECECP703X	Program Elective-4	3	0	0	3
4	18ECXXO704X	Open Elective-1	3	0	0	3
5	18ECXXO705X	Open Elective-2	3	0	0	3
6	18ECECL706X	Elective Related Lab	0	0	4	2
7	18ECECR7070	Project Work Phase-I	0	0	8	4
8	18ECECR7080	Internship	0	0	0	2
					Total Credits	**23**

Semester VIII (Fourth year)

S.No	Course Code	Course Title	L	T	P	C
1	18ECECP801X	Program Elective-5	3	0	0	3
2	18ECECP802X	Program Elective-6	3	0	0	3
3	18ECXXO803X	Open Elective-3	3	0	0	3
4	18ECXXO804X	Open Elective-4	3	0	0	3
5	18ECECR8050	Project Work Phase-II	0	0	14	7
6	18ECECC8060	Co-Curricular and Extra Curricular Activity (MC)	0	0	0	0
					Total Credits	**19**

Program Elective Courses:

Program Elective-1	18ECECP603A	Antennas & Wave Propagation
	18ECECP603B	CMOS VLSI Design
	18ECECP603C	Advanced Digital Signal Processing
Program Elective-2	18ECECP604A	Microwave Theory and Techniques
	18ECECP604B	Digital Design through Verilog HDL
	18ECECP604C	Digital Image Processing
Program Elective-3	18ECECP702A	Optical Communications
	18ECECP702B	Low Power VLSI
	18ECECP702C	Information Theory & Coding
Program Elective-4	18ECECP703A	Wireless Sensor Networks

	18ECECP703B	Bio-Medical Electronics
	18ECECP703C	Embedded System Design
Program Elective-5	18ECECP801A	Cellular Mobile Communication
	18ECECP801B	VLSI Physical Design Automation
	18ECECP801C	Internet of Things and its applications
Program Elective-6	18ECECP802A	Radar Systems
	18ECECP802B	Nano Electronics
	18ECECP802C	Embedded & Real Time Concepts

Elective Related Laboratories:

Elective Related Lab	18ECECL706A	Microwave & Optical Communication Lab
	18ECECL706B	VLSI Design Lab
	18ECECL706C	Embedded Systems Lab

Open Elective Courses offered by ECE to other Departments:

Open Electives	18XXECOX0XA	Microcontroller Programming
	18XXECOX0XB	Internet of Things and its applications
	18XXECOX0XC	Digital Signal Processing
	18XXECOX0XD	Digital Image Processing
	18XXECOX0XE	Antennas and Wave Propagation
	18XXECOX0XF	Cellular Mobile Communication
	18XXECOX0XG	VLSI Design
	18XXECOX0XH	VLSI Physical Design Automation

Head of the Department

Head of the Department
Electronics & Communication Engineering
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CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS SEMESTER - I			
Subject Code	18CMMSN1080	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit -1	
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours – 10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours – 10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**Hours – 10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes	**Hours –10**

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Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility.Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours – 10**
COURSE OUTCOMES: On completion of the course student will 1. Have general knowledge and legal literacy and thereby to take up competitive examinations. 2. Understand state and central policies, fundamental duties. 3. Understand Electoral Process, special provisions. 4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and 5. Understand Engineering ethics and responsibilities of Engineers 6. Understand Engineering Integrity & Reliability	
QUESTION PAPER PATTERN: **SECTION A:** 1. This section contains ten one answer questions carrying 1 mark each. 2. Two questions from each unit should present. **SECTION B:** 1. This section will have 5 questions with internal choice. 2. Each full question carries 12 marks. 3. Each full question will have sub question covering all topics under a unit.	
TEXT BOOKS: **Text Books:** 1. Durga Das Basu: **"Introduction to the Constitution on India"**, (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn.,	

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2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics"**, Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources

1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

Course outcomes to Program outcomes mapping:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Co urse	-	-	-	-	-	3	-	5	-		-	-	-	-	-

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PERSONALITY DEVELOPMENT & PROFESSIONAL COMMUNICATION			
Subject Code	18CMEGT5020	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Credits – 02			

Unit -1: Personality Development	Hours
a) Personal Effectiveness- being proactive- principles of personal vision, b) Intrapersonal communication- emotional intelligence- beginning with the end in mind- c) Time management: understanding priorities- first things first- time – personal effectiveness	05
Unit -2: Emotional Intelligence and Intrapersonal Communication	
a) Principles of Emotional Intelligence – b) Intrapersonal Communication- c) Principles of creative cooperation-organization skills-Think win-win d) Principles of balanced self-renewal- Lifelong learning	05
Unit – 3:Career and Employability Skills	
a) Understanding Career values- values grid-career thinking- what is a career? b) Skills vs strengths- spotting skills- reflecting on skills- setting goals for developing skills- c) Meeting the expectations of the employer-understanding job description- Skills Grid exercises- matching the skills with requirements d) Preparing Resume and Preparing for interviews- Structuring interview questions- CAR- Context, Action and Results	06
Unit – 4:Problem Solving Skills	
a) Understanding the complexity at workplace- b) defining the problem- identifying the reasons- c) finding possible solutions- planning actions- analyzing results- feedback d) redefining the problem- the problem solving cycle	06
Unit – 5:Professional Communication	
a) Active listening skills- note taking- b) Professional presentation skills- understanding the context- expectations of the people- putting across the message effectively- answering questions- c) Technical writing skills- practical steps for writing- report writing and writing a report free from plagiarism.	10

Text(T) / Reference(R) Books:	
T1	English and Soft Skills, Dr. S.P. Dhanvel, Orient Blackswan, 2011
R1	Seven Habits of Highly Effective People, Stephen R Covey
R2	Professional Communication, ArunaKoneru, Mc Graw Hill
R3	Personality Development and Soft Skills, Barun K Mitra OUP
R4	Enhance Your Employability Skills, David Winter and Laura Brammar, University of London.
W1	https://www.coursera.org/browse/personal-development
W2	https://alison.com/courses/personal-development

Course Outcomes: On completion of this course, students can	
CO1	Understand Personality development process and learn to implement effective techniques.
CO2	Understand how people behave and regulate self-behaviors and learn to work in a team.
CO3	Know their career values, identify their skills, set goals for enhancing their career skills and prepare for interviews
CO4	Understand and learn how to deal with problems and practice problem solving skills.
CO5	Learn the principles of professional communication & application of the same

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO2	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO3	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO4	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO5	-	-	-	-	-	-	-	2	-	3	-	2	-	-
Course	-	-	-	-	-	-	-	2	-	3	-	2	-	-

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BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Unit -1: Introduction	Hours
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	08
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	08
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	12
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	12

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genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms.** Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

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COURSE STRUCTURE

SITE18M

REGULATIONS

For

Computer Science and Engineering

With effective from the Academic Year 2018-19

I B. Tech I Semester Course structure for the AcademicYear 2018-2019

Common for ECE/CSE/IT

S. No.	Subject Code	Subject title	L	T	P	C
1	18CMMAT1010	Engineering Mathematics-I	3	1	0	4
2	18CSPHT1020	EngineeringPhysics	3	1	0	4
3	18CMCST1030	Programming for problem solving	3	0	0	3
4	18CMMEL1040	Engineering Graphics	1	0	4	3
5	18CSPHL1050	Engineering Physics Lab	0	0	3	1.5
6	18CMCSL1060	Programming for problem solving lab	0	0	4	2
7	18CMMEL1070	Work Shop/ Manufacturingpractice	0	0	3	1.5
8	18CMCHN1080	Environmental Science	3	0	0	0
Total Credits						**19**

I B. Tech II Semester Course structure for the AcademicYear 2018-2019

S. No.	Subject Code	Subject title	L	T	P	C
1	18CMEGT2010	Technical English	3	0	0	3
2	18CMMAT2020	Engineering Mathematics II	3	1	0	4
3	18CMCHT2030	Engineering Chemistry	3	1	0	4
4	18CMEET2040	Basic Electrical Engineering	3	1	0	4
5	18CMEGL2050	English Communication skills lab	0	0	2	1
6	18CMCHL2060	Engineering Chemistry Lab	0	0	3	1.5
7	18CMEEL2070	Basic Electrical Engineering Lab	0	0	3	1.5
8	18CMMSN2080	Constitution of India, professionalethics & human rights	3	0	0	0
Total Credits						**19**

Course Structure forB.Tech.

(Computer Science and Engineering & Information Technology)Semester III

(Second year)

S. No	Course Code	Course Title	L	T	P	C
1	18CMMAT3010	Engineering Mathematics-III	3	1	0	4
2	18CSECT3020 18ITECT3020	Digital Electronics	3	0	0	3
3	18CSECT3030 18ITECT3030	Analog Electronic Circuits	3	0	0	3
4	18CSCST3040 18ITITT3040	Discrete Mathematics	3	1	0	4
5	18CSCST3050 18ITITT3050	Data Structures	3	0	0	3
6	18CSECL3060 18ITECL3060	Analog & Digital Electronics Lab	0	0	3	1.5
7	18CSCSL3070 18ITITL3070	IT Workshop Lab	0	0	3	1.5
8	18CSCSL3080 18ITITL3080	Data Structures Lab	0	0	3	1.5
Total Credits						**21.5**

(Computer Science and Engineering & Information Technology)Semester IV

(Second year)

S. No	Course Code	Course Title	L	T	P	C
1	18CSECT4010 18ITECT4010	Signals & Systems	3	0	0	3
2	18CMCET4020 18CMCET4020	Engineering Mechanics	3	0	0	3
3	18CSCST4030 18ITITT4030	Computer Organization	3	0	0	3
4	18CSCST4040 18ITITT4040	Algorithm Design and Analysis	3	0	0	3
5	18CSCST4050 18ITITT4050	Java Programming	3	0	0	3
6	18CSCSL4060 18ITITL4060	Computer Organization Lab	0	0	3	1.5
7	18CSCSL4070 18ITITL4070	Algorithm Design and Analysis Lab	0	0	3	1.5
8	18CSCSL4080 18ITITL4080	Java Programming Lab	0	0	3	1.5
Total Credits						**19.5**

III B. Tech I Semester

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18CMBIT5010	BS	Biology for Engineers	3			3
02	18CMEGT5020	HS	Personality Development & Professional Communication	2			2
03	18CMMST5030	HS	Management Science	3			3
04	18CSCST5040	PC	Computer Networks	3			3
05	18CSCST5050	PC	Operating Systems	3			3
06	18CSCSL5060	PC	Computer Networks Lab			3	1.5
07	18CSCSL5070	PC	Operating Systems Lab			3	1.5
08	18CSCSL5080	PC	R Programming Lab			3	1.5
				14		9	**18.5**
				23			

III B. Tech II Semester

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18CSCST6010	PC	Formal Languages & Automata Theory	3			3
02	18CSCST6020	PC	Database Systems	3			3
03	18CSCSP603G	PE	Program Elective-I	3			3
04	18CSHHO604G	OE	Open Elective-I	3			3
05	18CMMST6050	HS	Engineering Economics & Financial Management	3			3
06	18CSCSL6060	PC	Database Systems Lab			3	1.5
07	18CSCSL6070	PC	Python Programming Lab			3	1.5
08	18CSCSR6080	PROJ	Term Paper + Seminar			4	2
				15		10	**20**
				26			

IV B. Tech I Semester

S. No.	Subject			Hours			
	Code	Type	Title	L	T	P	C
01	18CSCST7010	PC	Compiler Design	3			3
02	18CSCSP702G	PE	Program Elective-II	3			3
03	18CSCSP703G	PE	Program Elective-III	3			3
04	18CSHHO704G	OE	Open Elective-II	3			3
05	18CSHHO705G	OE	Open Elective-III	3			3
06	18CSCSL7060	PC	Compiler Design Lab			3	1.5
07	18CSCSR7070	PROJ	Internship				2
08	18CSCSR7080	PROJ	Project-I			8	4
				15	0	11	**22.5**
				26			

IV B. Tech II Semester

S. No.	Subject			Hours			
	Code	Type	Title	L	T	P	C
01	18CSCSP801G	PE	Program Elective-IV	3			3
02	18CSCSP802G	PE	Program Elective-V	3			3
03	18CSCSP803G	PE	Program Elective-VI	3			3
04	18CSHHO804G	OE	Open Elective-IV	3			3
05	18CSCSR8050	PROJ	Project-II			14	7
06		PROJ	Co-curricular/Extra-curricular Activities	2			1
				14		14	**20**
				28			

Program Elective-I	
18CSCSP6031	Software Engineering
18CSCSP6032	Network Protocols
18CSCSP6033	Mobile Application Development
Program Elective-II	
18CSCSP7021	Unified Modeling Language
18CSCSP7022	Cryptography & Network Security
18CSCSP7023	Data Warehousing & Mining
Program Elective-III	
18CSCSP7031	Design Patterns
18CSCSP7032	Cyber Security
18CSCSP7033	Artificial Intelligence
Program Elective-IV	
18CSCSP8011	Software Testing
18CSCSP8012	Mobile Computing
18CSCSP8013	Machine Learning
Program Elective-V	
18CSCSP8021	Software Quality Assurance
18CSCSP8022	Ad-hoc & Sensor Networks
18CSCSP8023	Hadoop & Big Data
Program Elective-VI	
18CSCSP8031	Software Project Management
18CSCSP8032	Cyber Forensics
18CSCSP8033	Data Science

ENVIRONMENTAL SCIENCE SEMESTER - I			
Subject Code	18CMCHN1080	IA Marks	30
Number of Lecture Hours/Week	04	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -1	**Hours**
MULTIDISCIPLINARYNATUREOF ENVIRONMENTALSTUDIES **Environment-**Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. -Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the different ecosystems	**10**
Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems –Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**12**
Unit -3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographically classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega- diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**6**
Unit -4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of:	**12**

a. Air pollution f. Water pollution b. Soil pollution g. Marine pollution c. Noise pollution d. Thermal pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	
Unit -5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. - Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. - Study of simple ecosystems - pond, river, hill slopes, etc.	**10**
COURSE OUTCOMES: On completion of the course student will be 1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges. 2. Able to understand the concept of eco system and its diversity. 3. Able to gain knowledge on natural resources. 4. Able to understand the concept of biodiversity. 5. Able to gain knowledge on environmental pollution. 6. Gain knowledge on environmental legislation and global treaties.	
Question paper pattern: 1. Question paper consists of 10 questions. 2. Each full question carrying 14 marks. 3. Each full question will have sub question covering all topics under a unit. 4. The student will have to answer 5 full questions selecting one full question from each unit.	
TEXT BOOKS: 1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi. 2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi 3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall ofIndia, New Delhi	
REFERENCE BOOKS: 1. Text Book of Environmental Studies by Deeshita Dave&P. Udaya Bhaskar, Cengage Learning. 2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada. 3. Environmental Studies, P.N. Paliniswamy, P. Manikandan,A. Geeta and K. Manjula Rani, Pearson Education, Chennai.	

Course Outcomes to Program Outcomes Mapping:

CO	PO1	PO2	PO 3	PO4	PO5	PO6	PO7	PO 8	PO9	PO 10	PO11	PO12	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-
6	-	3		-	-	-	-	-	-	-	-	-	-	-	-
Course	3	3	3	-	-	-	3	-	-	-	-	-	-	-	-

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS SEMESTER - I			
Subject Code	18CMMSN1080	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit -1	
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours – 10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours – 10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**Hours – 10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes	**Hours –10**

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Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility.Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours – 10**
COURSE OUTCOMES: On completion of the course student will 1. Have general knowledge and legal literacy and thereby to take up competitive examinations. 2. Understand state and central policies, fundamental duties. 3. Understand Electoral Process, special provisions. 4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and 5. Understand Engineering ethics and responsibilities of Engineers 6. Understand Engineering Integrity & Reliability	
QUESTION PAPER PATTERN: **SECTION A:** 1. This section contains ten one answer questions carrying 1 mark each. 2. Two questions from each unit should present. **SECTION B:** 1. This section will have 5 questions with internal choice. 2. Each full question carries 12 marks. 3. Each full question will have sub question covering all topics under a unit.	
TEXT BOOKS: **Text Books:** 1. Durga Das Basu: **"Introduction to the Constitution on India"**, (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn.,	

2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics"**, Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources

1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

Course outcomes to Program outcomes mapping:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Co urse	-	-	-	-	-	3	-	5	-		-	-	-	-	-

APPROVED

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 03

Unit -1: Introduction	**Hours**
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	**08**
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**08**
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	**12**
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	**12**

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genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms**. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

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PERSONALITY DEVELOPMENT & PROFESSIONAL COMMUNICATION			
Subject Code	18CMEGT5020	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Credits – 02			

Unit -1: Personality Development	Hours
a) Personal Effectiveness- being proactive- principles of personal vision, b) Intrapersonal communication- emotional intelligence- beginning with the end in mind- c) Time management: understanding priorities- first things first- time – personal effectiveness	05
Unit -2: Emotional Intelligence and Intrapersonal Communication	
a) Principles of Emotional Intelligence – b) Intrapersonal Communication- c) Principles of creative cooperation-organization skills-Think win-win d) Principles of balanced self-renewal- Lifelong learning	05
Unit – 3:Career and Employability Skills	
a) Understanding Career values- values grid-career thinking- what is a career? b) Skills vs strengths- spotting skills- reflecting on skills- setting goals for developing skills- c) Meeting the expectations of the employer-understanding job description- Skills Grid exercises- matching the skills with requirements d) Preparing Resume and Preparing for Interviews- Structuring interview questions- CAR- Context, Action and Results	06
Unit – 4:Problem Solving Skills	
a) Understanding the complexity at workplace- b) defining the problem- identifying the reasons- c) finding possible solutions- planning actions- analyzing results- feedback d) redefining the problem- the problem solving cycle	06
Unit – 5:Professional Communication	
a) Active listening skills- note taking- b) Professional presentation skills- understanding the context- expectations of the people- putting across the message effectively- answering questions- c) Technical writing skills- practical steps for writing- report writing and writing a report free from plagiarism.	10

Text(T) / Reference(R) Books:	
T1	English and Soft Skills, Dr. S.P. Dhanvel, Orient Blackswan, 2011
R1	Seven Habits of Highly Effective People, Stephen R Covey
R2	Professional Communication, ArunaKoneru, Mc Graw Hill
R3	Personality Development and Soft Skills, Barun K Mitra OUP
R4	Enhance Your Employability Skills, David Winter and Laura Brammar, University of London.
W1	https://www.coursera.org/browse/personal-development
W2	https://alison.com/courses/personal-development

Course Outcomes: On completion of this course, students can	
CO1	Understand Personality development process and learn to implement effective techniques.
CO2	Understand how people behave and regulate self-behaviors and learn to work in a team.
CO3	Know their career values, identify their skills, set goals for enhancing their career skills and prepare for interviews
CO4	Understand and learn how to deal with problems and practice problem solving skills.
CO5	Learn the principles of professional communication & application of the same

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO2	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO3	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO4	-	-	-	-	-	-	-	2	-	3	-	2	-	-
CO5	-	-	-	-	-	-	-	2	-	3	-	2	-	-
Course	-	-	-	-	-	-	-	2	-	3	-	2	-	-

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II

SITE 18

COURSE STRUCTURE AND DETAILED SYLLABUS

for

Bachelor of Technology
in
Information Technology

With effective from the

Academic Year 2018-19

sasi INSTITUTE OF TECHNOLOGY & ENGINEERING
autonomous
Accredited by NAAC with "A" Grade
Recognised by UGC under section 2(f) &12(B)
Approved by AICTE - NEW Delhi
Permanently Affiliated to JNTUK, SBTET
Ranked as "A" Grade by Govt. of A.P.
Department of Information Technology

I B. Tech I Semester Course structure for the Academic Year 2018-2019

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18CMMAT1010	BS	Engineering Mathematics-I	3	1		4
02	18ITPHT1020	BS	Engineering Physics	3	1		4
03	18CMCST1030	ES	Programming for Problem Solving	3			3
04	18CMMEL1040	ES	Engineering Graphics	1		4	3
05	18ITPHL1050	BS	Engineering Physics Lab			3	1.5
06	18CMCSL1060	ES	Programming for Problem Solving Lab			4	2
07	18CMMEL1070	ES	Workshop/Manufacturing Practice	0		3	1.5
08	18CMCHN1080	MC	Environmental Science	3			0
				14	2	15	19
				31			

I B. Tech II Semester Course structure for the Academic Year 2018-2019

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18CMEGT2010	HS	Technical English	3			3
02	18CMMAT2020	BS	Engineering Mathematics-II	3	1		4
03	18CMCHT2030	BS	Engineering Chemistry	3	1		4
04	18CMEET2040	ES	Basic Electrical Engineering	3	1		4
05	18CMEGL2050	HS	English Communication Skills Lab			2	1
06	18CMCHL2060	BS	Engineering Chemistry Lab			3	1.5
07	18CMEEL2070	ES	Basic Electrical Engineering Lab			3	1.5
08	18CMMSN2080	MC	Indian Constitution, Professional Ethics & Human Rights	3			0
				15	3	8	19
				26			

II B. Tech I Semester Course structure for the Academic Year 2019-2020

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18CMMAT3010	BS	Engineering Mathematics-III	3	1		4
02	18ITECT3020	ES	Digital Electronics	3			3
03	18ITECT3030	ES	Analog Electronic Circuits	3			3
04	18ITITT3040	PC	Discrete Mathematics	3	1		4
05	18ITITT3050	PC	Data Structures	3			3
06	18ITECL3060	ES	Analog & Digital Electronics Lab			3	1.5
07	18ITITL3070	PC	IT Workshop Lab			3	1.5
08	18ITITL3080	PC	Data Structures Lab			3	1.5
				15	2	9	21.5
				26			

II B. Tech II Semester Course structure for the Academic Year 2019-2020

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18ITECT4010	ES	Signals & Systems	3			3
02	18CMCET4020	ES	Engineering Mechanics	3			3
03	18ITITT4030	PC	Computer Organization	3			3
04	18ITITT4040	PC	Algorithm Design and Analysis	3			3
05	18ITITT4050	PC	Java Programming	3			3
06	18ITITL4060	PC	Computer Organization Lab			3	1.5
07	18ITITL4070	PC	Algorithm Design and Analysis Lab			3	1.5
08	18ITITL4080	PC	Java Programming Lab			3	1.5
				15		9	**19.5**
				24			

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III B. Tech I Semester Course structure for the Academic Year 2020-2021

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18CMBIT5010	BS	Biology for Engineers	3			3
02	18CMEGT5020	HS	Personality Development & Professional Communication	2			2
03	18CMMST5030	HS	Management Science	3			3
04	18ITITT5040	PC	Database Systems	3			3
05	18ITITT5050	PC	Operating Systems	3			3
06	18ITITL5060	PC	Advanced Java and Web Technologies Lab			3	1.5
07	18ITITL5070	PC	Operating Systems& UNIX Programming Lab			3	1.5
08	18ITITL5080	PC	Database Systems Lab			3	1.5
				14		9	**18.5**
				23			

III B. Tech I Semester Course structure for the Academic Year 2020-2021

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18ITITT6010	PC	Computer Networks	3			3
02	18ITITT6020	PC	Software Engineering	3			3
03	18ITITP603G	PE	Program Elective-I	3			3
04	18ITITO604G	OE	Open Elective-I	3			3
05	18CMMST6050	HS	Engineering Economics & Financial Management	3			3
06	18ITITL6060	PC	Software Engineering Lab			3	1.5
07	18ITITL6070	PC	Python Programming Lab			3	1.5
08	18ITITR6080	PROJ	Term Paper + Seminar			4	2
				14		**9**	**20**
				23			

IV B. Tech I Semester Course structure for the Academic Year 2021-2022

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18ITITT7010	PC	Cryptography and Network security	3			3
02	18ITITP702G	PE	Program Elective-II	3			3
03	18ITITP703G	PE	Program Elective-III	3			3
04	18ITITO704G	OE	Open Elective-II	3			3
05	18ITITO705G	OE	Open Elective-III	3			3
06	18ITITL7060	PC	Object Oriented Analysis and Design Lab			3	1.5
07	18ITITR7070	PROJ	Internship				2
08	18ITITR7080	PROJ	Project Phase – I			8	4
				15	0	11	22.5
				26			

IV B. Tech II Semester Course structure for the Academic Year 2021-2022

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18ITITP801G	PE	Program Elective-IV	3			3
02	18ITITP802G	PE	Program Elective-V	3			3
03	18ITITP803G	PE	Program Elective-VI	3			3
04	18ITITO8040	OE	Open Elective-IV	3			3
05	18ITITR8050	PROJ	Project Phase- II			14	7
06			Co-curricular/Extra-curricular Activities	2			1
				12		14	20
				26			

Program Elective-I	
18ITITP603A	Wireless Sensor Networks
18ITITP603B	UI Design
Program Elective-II	
18ITITP702A	R Programming
18ITITP702B	Software Quality Assurance
Program Elective-III	
18ITITP703A	Cloud Computing
18ITITP703B	Software Testing Methodologies
Program Elective-IV	
18ITITP801A	Distributed Databases
18ITITP801B	Fault Tolerant Systems
Program Elective-V	
18ITITP802A	Big Data Analytics
18ITITP802B	Software Project Management
Program Elective-VI	
18ITITP803A	Open Source Software
18ITITP803B	Optimization Techniques

Open Electives	
18XXITOXXMA	Office Automation
18XXITOXXMB	Internet & Web Hosting
18XXITOXXMC	Cloud Computing
18XXITOXXMD	E-Commerce
18XXITOXXME	Statistics and R Programming
18XXITOXXMF	Open Source software
18XXITOXXMH	Mobile Application Development

Head of the Department

Head of the Department
Department of Information Technol
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ENVIRONMENTAL SCIENCE SEMESTER - II			
Subject Code	18CMCHN2080	Internal Marks	30
Number of Lecture Hours/Week	04	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the different	**Hours – 10**

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ecosystems	
Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**Hours – 12**
Unit – 3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**Hours – 6**

APPROVED

Unit – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	**Hours – 12**
Unit – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems - pond, river, hill slopes, etc.	**Hours – 10**
COURSE OUTCOMES:	

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On completion of the course student will be

1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Able to understand the concept of ecosystem and its diversity.
3. Able to gain knowledge on natural resources.
4. Able to understand the concept of biodiversity.
5. Able to gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

QUESTION PAPER PATTERN:

SECTION A:

1. This section contains ten one answer question carrying 1 mark each.
2. Two questions from each unit should present.

SECTION B:

1. This section will have 5 questions with internal choice.
2. Each full question carries 12 marks.
3. Each full question will have sub question covering all topics under a unit.

TEXT BOOKS:

1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi
3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.

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2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. Environmental Studies, P.N. Paliniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

Course Outcomes to Program Outcomes Mapping:

CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-
6	-	3		-	-	-	-	-	-	-	-	-	-	-	-
Cour se	3	3	3	-	-	-	3	-	-	-	-	-	-	-	-

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CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS SEMESTER - I			
Subject Code	18CMMSN1080	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit -1	
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours – 10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours – 10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**Hours – 10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes	**Hours –10**

Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility.Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours – 10**
COURSE OUTCOMES: On completion of the course student will 1. Have general knowledge and legal literacy and thereby to take up competitive examinations. 2. Understand state and central policies, fundamental duties. 3. Understand Electoral Process, special provisions. 4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and 5. Understand Engineering ethics and responsibilities of Engineers 6. Understand Engineering Integrity & Reliability	
QUESTION PAPER PATTERN: **SECTION A:** 1. This section contains ten one answer questions carrying 1 mark each. 2. Two questions from each unit should present. **SECTION B:** 1. This section will have 5 questions with internal choice. 2. Each full question carries 12 marks. 3. Each full question will have sub question covering all topics under a unit.	
TEXT BOOKS: **Text Books:** 1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn.,	

2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:
1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics"**, Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma," **Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources
1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

Course outcomes to Program outcomes mapping:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Co urse	-	-	-	-	-	3	-	5	-		-	-	-	-	-

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 03

Unit -1: Introduction	**Hours**
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	**08**
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**08**
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	**12**
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	**12**

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genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms**. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

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PERSONALITY DEVELOPMENT & PROFESSIONAL COMMUNICATION SEMESTER V			
Subject Code	18CMEGT5020	Internal Marks	30
Number of Lecture Hours/Week	02	External Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Pre-requisite	---	Credits – 02	

Aim of the Course:

Personality Development and Professional Communication skills course aims at equipping students with required skills such as personality development, interpersonal communication skills, career and employability skills, problem solving, and professional communication skills to succeed in their personal and professional life as well as to build a bright career with a clear understanding of their career values through experiential learning and performing several professional tasks.

Objectives: This course will enable students to:

- Understand the process of Personality Development and learn effective methods of developing personality
- Emotional Intelligence, and Intrapersonal skills
- Career skills, Interview skills and Employability Skills
- Problem Solving skills
- Professional Communication skills

Training Methodology: The training methodology is designed to bring about changes in attitudes through experience-based learning. Activities in simulated environments such as role plays, group discussions, micro presentations, audio-video clippings, case studies, psychometric tests etc., will provide students insights into their strengths and areas for development. There will be a project work with problem analysis and presentation of the same.	**Teaching Hours 32**
Course Contents	
Unit –I	
Personality Development a) Personal Effectiveness- being proactive- principles of personal vision b) Intrapersonal communication- emotional intelligence- beginning with the end in mind- c) Time management: understanding priorities- first things first- time – personal effectiveness	**5**
Unit –2	
Emotional Intelligence and Intrapersonal Communication a) Principles of Emotional Intelligence b) Intrapersonal Communication c) Principles of creative cooperation-organization skills-Think win-win d) Principles of balanced self-renewal- Lifelong learning	**5**
Unit – 3	
Career and Employability Skills a) Understanding Career values- values grid-career thinking- what is a career? b) Skills vs strengths- spotting skills- reflecting on skills- setting goals for developing skills c) Meeting the expectations of the employer-understanding job description, Skills Grid exercises- matching the skills with requirements d) Preparing Resume and Preparing for interviews- Structuring interview	**6**

questions- CAR- Context, Action and Results	
Unit – 4	
Problem Solving Skills a) Understanding the complexity at workplace b) defining the problem- identifying the reasons c) finding possible solutions- planning actions- analysing results-feedback d) redefining the problem- the problem solving cycle	**6**
Unit – 5	
Professional Communication a) Active listening skills- note taking- b) Professional presentation skills- understanding the context- expectations of the people- putting across the message effectively- answering questions c) Technical writing skills- practical steps for writing- report writing and writing a report free from plagiarism.	**10**

Course outcomes:

On completion of the course student will be able to:

1. Understand Personality development process and learn to implement effective techniques.
2. Understand how people behave and regulate self behaviours and learn to work in a team.
3. Know their career values, indentify their skills, set goals for enhancing their career skills.
4. Understand and learn how to deal with problems and practice problem solving skills.
5. Learn the principles of professional communication & application of the same
6. Face job interviews confidently and work a team effectively

Question paper pattern:

Section A:

1. This section contains ten one or two line answer question carrying 1 mark each.
2. Two questions from each unit should present.

Section B:

1. This Section will have 10 questions, 2 from each unit
2. Each full question carry 12 marks.
3. Each full question will have sub question covering all topics under a unit.
4. The student will have to answer 5 full questions selecting one full question from each unit

Text Books:

1. Dr. S.P. Dhanvel, English and Soft Skills, Orient Blackswan, 2011

Reference Books:

1. Seven Habits of Highly Effective People by Stephen R Covey
2. Professional Communication by Aruna Koneru, Mc Graw Hill
3. Personality Development and Soft Skills by Barun K Mitra OUP
4. Enhance Your Employability Skills-by David Winter and Laura Brammar, published by University of London -Open Courseware https://www.mooc-list.com/course/enhance-your-career-and-employability-skills-coursera
5. R.S.Agarwal, Verbal & Non-verbal Reasoning, S. Chand& Co. Latest ed.,2003
6. Stay Hungry and Stay Foolish speech by Steve Jobs You Tube video
7. https://www.mindtools.com/

Course Outcomes to Program Outcomes mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-
2	-	-	-	-	-	-	-	-	3	2	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-
5	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
6	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-
Course	-	-	-	-	-	-	-	-	1	2	1	1	-	-	-

S.No.	Unit Name	Text books/Reference Books	Chapter Number
1	Personality Development	T1	1,2,3
		R1	Part 2
2	Interpersonal Communication Skills	T1	2,4 and 8
		R1	Part 3
		R2	2 and 3
3	Career and Employability Skills	T1	7
		R4	4
4	Problem Solving Skills	T1	6
		R5	7
5	Professional Communication	T1	8 and 10
		R2	3and 4

1.3.1
MS

COURSE STRUCTURE AND DETAILED SYLLABUS

for

Master of Business Administration

(MBA)

Effective from the academic year 2018-2019

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Department of Management Science

MBA I Semester Proposed Course structure from the Academic Year 2018-2019

S. No	Subject Code	Title of the Course	T	L	C	Internal	External	Total
1.	MS01T1	Principles of Management	4	-	3	40	60	100
2.	MS01T2	Managerial Economics	4	-	3	40	60	100
3.	MS01T3	Accounting For Managers	4	-	3	40	60	100
4.	MS01T4	Managerial Communication & Soft Skills	4	-	3	40	60	100
5.	MS01T5	Quantitative Analysis for Business Decisions	4	-	3	40	60	100
6.	MS01T6	Business Environment	4	-	3	40	60	100
7.	CS01L7	Information Technology Lab	-	3	3	40	60	100
8.	MS01C8	Case Study*	2	-	2	-	-	-
Total Credits for I Semester (A)					**23**	**280**	**420**	**700**

MBA II Semester Proposed Course structure from the Academic Year 2018-2019

S. No	Subject Code	Title of the Course	T	L	C	Internal	External	Total
1.	MS02T1	Financial Management	4	-	3	40	60	100
2.	MS02T2	Marketing Management	4	-	3	40	60	100
3.	MS02T3	Human Resource Management	4	-	3	40	60	100
4.	MS02T4	Production & Operations Management	4	-	3	40	60	100
5.	MS02T5	Research Methodology	4	-	3	40	60	100
6.	MS02T6	Organisational Behaviour	4	-	3	40	60	100
7.	MS02P7	Mini Project	4	-	2	-	-	50
		Seminar on Mini Project		-	2	-	-	50
8.	MS02C8	Case Study*	2	-	2	-	-	-
Total Credits for II Semester (B)					**24**	**240**	**360**	**700**

MBA III Semester Proposed Course structure from the Academic Year 2019-2020

S. No	Subject Code	Title of the Course	T	L	C	Internal	External	Total
1.	MS03T1	Strategic Management	4	-	3	40	60	100
2.	MS03T2	Legal Aspects of Business	4	-	3	40	60	100
3.	MS03T3	Business Ethics & Corporate Governance	4	-	3	40	60	100
4.	MS03F4/ M4/H4	Elective – I	4	-	3	40	60	100
5.	MS03F5/ M5/H5	Elective – II	4	-	3	40	60	100
6.	MS03F6/ M6/H6	Elective – III	4	-	3	40	60	100
7.	MS03F7/ M7/H7	Elective – IV	4	-	3	40	60	100
8.	MS03C8	Case Study*	2	-	2	-	-	-
Total Credits for III Semester (C)					**23**	280	**420**	**700**

The students may choose **ONE** Specialization among the following:

Subject code	Finance	Subject code	Marketing	Subject Code	HR
MS03F4	Security Analysis & Portfolio Management	MS03M4	Consumer Behaviour	MS03H4	Leadership Management
MS03F5	Banking & Insurance Management	MS03M5	Retail Marketing	MS03H5	Compensation and Reward Management
MS03F6	Advanced Cost & Management Accounting	MS03M6	Customer Relationship Management	MS03H6	Performance Management
MS03F7	Strategic Financial Management	MS03M7	Strategic Marketing Management	MS03H7	Strategic Human Resource Management

MBA IV Semester Proposed Course structure from the Academic Year 2019-2020

S. No	Subject Code	Title of the Course	T	L	C	Internal	External	Total
1.	MS04T1	Logistics & Supply Chain Management	4	-	3	40	60	100
2.	MS04T2	Entrepreneurship Development	4	-	3	40	60	100
3.	MS04F3/ M3/H3	Elective – V	4	-	3	40	60	100
4.	MS04F4/ M4/H4	Elective – VI	4	-	3	40	60	100
5.	MS04F5/ M5/H5	Elective – VII	4	-	3	40	60	100
6.	MS04F6/ M6/H6	Elective – VIII	4	-	3	40	60	100
7.	MS04C7	Case Study*	2	-	2	-	-	-
8.	MS04P8	Internship/Project and Viva Voce	-	-	10	-	-	-
Total Credits for IV Semester (D)					**30**	**240**	**360**	**600**

The students may choose **ONE** Specialization among the following:

Subject Code	Finance	Subject Code	Marketing	Subject code	HR
MS04F3	Financial Markets & Service	MS04M3	Services Marketing	MS04H3	Global HRM
MS04F4	Global Financial Management	MS04M4	Promotion & Distribution Management	MS04H4	Organizational Development and Change Management
MS04F5	Financial Risk Management	MS04M5	Global Marketing Management	MS04H5	Labour Welfare Legislation
MS04F6	Tax Management	MS04M6	Product & Brand Management	MS04H6	Management of Industrial Relations

Number of Credits for each semester:

SEMESTER	CREDITS
I	23
II	24
III	23
IV	30
TOTAL	**100**

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Syllabus- MBA I Semester For the Autonomous Batch starting from A.Y. 2018-19

PRINCIPLES OF MANAGEMENT			
Subject Code	**18MS01T1**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	04	Exam Hours	03
Credits – 03			

COURSE OBJECTIVES:

- To describe the development of Management Thought and its relevance to business
- To familiarize with the knowledge, roles, responsibilities, and skills required for a modern managers

Unit -1	
Introduction of Management: Management: Definition – Importance – Managerial Roles – Functions of management – Evolution of Management Thought – Motivation Theories - Classical theory – Scientific management - Administrative theory – Behavioral Theory	**Hours – 10**
Unit -2	
Planning and Organizing: Nature and Definition of Planning – Principles of Planning – Objectives of planning – Planning process – Types of plans – Benefits and pitfalls of planning. Principles of organizing – Organization levels – Organizational designs and structure – Line and staff organizations – Approaches – Delegation of Authority – Factors affecting delegation of authority – Departmentation - Span of management – Centralization and decentralization of Authority.	**Hours – 10**
Unit – 3	
Directing and Controlling: Definition of Co-ordination – Significance and principles of Coordination– Leadership behavior and styles – Leadership in cross cultural environment. Nature and importance of controlling – Controlling process – Requirements of effective control – Establishing controlling system – Controlling techniques.	**Hours – 10**

Unit – 4	
Decision making: Meaning of decision – types of decisions – Rationale decision making process – Models of decision making – Problem solving and decision making – increasing participation in decision making – Vroom"s Participative decision making model – challenges and problems in decision making	**Hours –10**
Unit – 5	
Contemporary issues in Management: MBO - Management By Walking Around – Out of the Box Thinking – Balanced Score Card –Time Management –BPOs – Stress Management causes and remedies – JIT – TQM – Six Sigma – BPR.	**Hours – 10**
Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.	
COURSE OUTCOMES: • Students are able to understood the development of management thought • Students are familiar with the required skills, knowledge, abilities for a manager	
QUESTION PAPER PATTERN: **SECTION A:** • Five one page answer questions from each unit. **SECTION B:** • Three easy type questions out of five questions. **SECTION C:** • Case Study (Compulsory question)	
REFERENCE BOOKS: 1. William, Tripathy: "**MGMT (including instructor recourses)**", Cengage Learning, New Delhi, 2013. 2. Harold Koontz, Heinz Weihrich, Essentials of Management, *McGraw Hill Education,* 2010. 3. ***P.Subba Rao, Management Theory & Organisational Behaviour, Text & Cases*** Himalaya Publishing House, New Delhi, 2012, 4. V.S.P. Rao, Management Text & Cases, Excel Books Second Edition, 2012 5. Peter F. Drucker, Management, Tasks, Responsibilities, Practices, *Routledge International*, 1978 6. Dr.P.Subba Rao and Prof. N.SambasivaRao:"**Management and Organizational Behaviour - (Text and Cases)**", Himalaya Publishing House, Mumbai. 7. Neeta Baporikar, Case Method – Cases in Management, Himalya Publishing House, 2009.	

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8

CO								
1	3	-	-	-	-	-	-	2
2	-	-	-	-	3	-	-	-
3	-	3	-	-	-	-	-	-
4	-	3	-	-	-	-	-	-
5	-	-	-	-	2	-	-	-

3 – High; 2 – Medium; 1 – Low; 0 = No Matching

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Syllabus- MBA I Semester for the Autonomous Batch starting from A.Y. 2018-19

MANAGERIAL ECONOMICS			
Subject Code	**18MS01T2**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	04	Exam Hours	03
Credits – 03			

COURSE OBJECTIVES:

- To outline the basic concepts of Economics pertinent to business Decision Making
- To familiarise thevarious concepts of Managerial Economics
- To illustrate the various market structures and price determination in various markets.

Unit -1	
Introduction to Managerial Economics: Definition, Nature and Scope, Relationship with other areas in Economics, The role of managerial economist. Concept of opportunity cost, Incremental concept, time Perfective, Discounting Principle, Risk & uncertainty.	**Hours – 10**
Unit -2	
Demand Analysis: Elasticity of demand, types and significance of Elasticity of Demand - Measurement of price Elasticity of Demand – Need for Demand forecasting, forecasting techniques, Law of Supply.	**Hours – 10**
Unit – 3	
Production Analysis: Production functions, Production function with one/two variables, Marginal Rate of Technical Substitution, Cobb-Douglas Production Function, Returns to Scale and Laws of returns.	**Hours – 10**
Unit – 4	
Cost theory and Estimation: Cost concepts, Opportunity Cost, Fixed Cost vs. Variable Cost, Explicit vs. Implicit Cost Determinants of cost, cost – output relationship in the short run and long run –, Short – run Average cost curves –	**Hours –10**

Average total cost Curve – Cost - Volume – Profit analysis.	
Unit – 5	
Market Structures and Pricing practices: Features and Types of different Markets – Price- Output determination in Perfect competition, Monopoly, Monopolistic competition and Oligopoly both in the long run and short run. Pricing methods in practice – Managerial Theories of a firm – Marris& Williams Models.	**Hours – 10**
Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.	

COURSE OUTCOMES:

1. Students are experienced with various economic concepts
2. Students are aware the various concepts of Managerial Economics
3. Students are aware the various market structures and know the various price determination in each market structure

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. Mithani D M: ''**Managerial Economics**", Himalaya Publishing House, Mumbai, 2008.
2. D.N. Dwivedi, Managerial Economics, 8th Edition, *Vikas Publishing House, 2015*
3. Dr. Atmanand , Managerial Economics, Excel Books, 2012
4. R.H. Dahlokia, A.N. Oza, Micro Economics for Management, *Oxford University Press,*
5. 1999.
6. Pual G. Keat, Philip K.Y. Young, SreejataBenerjee, Managerial Economics, Economic Tools for Today's Decision Makers, *Pearson Education,* 2011.
7. Mark Hirshey&Bentzen, Managerial Economics, *Cengage International,* 2016.
8. Paul, Koushil: "**Managerial Economics**", Cengage Learning, New Delhi.
9. E. Narayana Nadar& S. Vijayan, Managerial Economics, *Prentice Hall of India,*
10. VanitaAgarwal, Managerial Economics, *Pearson Education, 2013*

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	-	3	-	-	-	-	-	2
2	-	-	-	2	-	-	-	-
3	-	-	-	-	-	2	-	-
4	-	-	-	-	2	-	-	-
5	-	-	-	-	3	-	-	-

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BUSINESS ENVIRONMENT			
Subject Code	**18MS01T6**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	04	Exam Hours	03
Credits – 03			

COURSE OBJECTIVES:

1. To understand the overview of business environment at National and International Level.
2. To describe the overview of Indian Economy with Economic Reforms
3. To familiarize the various policies of the Government of India pertaining to Indian Business
4. To describe the Legal framework of Government of India

Unit -1	
Business Environment: Importance at national and international level – problems and challenges – factors both internal and external influencing business environment. Industrial policies since independence and their significance – regulatory and promotional framework - Five-year plans and their importance.	**Hours – 10**
Unit -2	
Structure of Indian economy – Nature and significance – Economic systems – structure of Indian industry – Economic reforms in various sectors – nature – challenges – social justice – Disinvestment mechanism – problems and procedures – Sickness in Indian industry, competition Act 2002.	**Hours – 10**
Unit – 3	
Fiscal Policy: nature and significance – public revenues – expenditure- debt, development activities allocation of funds – critical analysis of the recent fiscal policy of Government of India. Balance of Payments: Nature – structure – major components – causes for disequilibrium in balance of payments – correction measures.	**Hours – 10**
Unit – 4	

India's Trade Policy: Nature – Magnitude and direction of Indian international trade – problems – bilateral and multilateral trade agreements. International business environment: Nature – significance– challenges and mechanisms. WTO: Agreements in the Uruguay round including TRIPS, TRIMS and GATS – disputes settlement mechanism – dumping and antidumping measures.	**Hours –10**
Unit – 5	
Legal Frame: special features of the SICA (special provisions) 1985, BIFR, Consumer protection act 1986, Environmental laws (pertaining to the control and prevention of Air and Water pollution) and the Essential Commodities Act 1955.	**Hours – 10**
Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.	

COURSE OUTCOMES:

1. Students are learned with the knowledge of business environment.
2. Students are able to gain knowledge regarding fiscal policy, balance of payment, trade policies and consumer protection act-1986
3. Ability to know the various components of Indian Economy
4. Understand the Legal framework of Government of India

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. ShaikhSaleem: "**Business Environment**", Pearsons, New Delhi,
2. VeenaKeshavPailwar: "**Economic Environment of Business**", PHI Learning, New Delhi, 2012
3. Aswathappa K: "**Essentials of Business Environment**", Himalaya Publishing House, New Delhi, 2011.
4. RuddarDutt& KPM Sundaram, Indian Economy, S.Chand Publishing
5. Faisal Ahmed, M.AbsarAlam, Business Environment, Indian & Global Perspective, *Prentice Hall of India, 2017, New Delhi*
6. Francis Cherunilam, Business Environment, Text & Cases, *Himalaya Publishing House, Mumbai, 2017.*
7. B.N.Ghosh, Business Environment, Oxford University Press, New Delhi, 2014.
8. Rosy Joshi, SangamKapoor: "**Business Environment**", Kalyani Publishers, New Delhi, 2011.

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	-	-	-	-	-	-	-	2
2	-	3	-	-	3	-	-	-
3	-	-	-	3	-	-	-	-
4	-	-	-	3	-	-	-	-
5	-	-	-	3	-	-	-	-

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Syllabus- MBA II Semester for the Autonomous Batch starting from A.Y. 2018-19

MARKETING MANAGEMENT			
Subject Code	**18MS02T2**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	04	Exam Hours	03
Credits – 03			

COURSE OBJECTIVES:

- To describe the concepts of marketing and the marketing system
- To demonstrate the Indian Marketing Environment and it relevance to Marketing Decisions
- To analyse the various elements of Marketing Mix

Unit -1	
Introduction to Marketing: Needs, Wants, Demands, Products, Exchange, Transactions, Market, Marketing, Production Concept, Product Concept, Sales Concept, Marketing Concept, Societal Marketing Concept, Indian Marketing Environment. Marketing Intelligence system, marketing decision system.	**Hours – 10**
Unit -2	
Market Segmentation and Targeting: Identification of Market Segments, - Consumer and Institutional/corporate Clientele - Segmenting Consumer Markets, Segmentation Basis, Selecting Target Markets, Segmentation and Targeting as a Basis for Strategy Formulation. Developing and Communicating a Positioning Strategy.	**Hours – 10**
Unit – 3	
Product & Pricing Strategy: Levels of the Product – Product Line and Mix – Product Life Cycle. Objectives of Pricing, Methods of Pricing, Selecting the final price, Adopting price, initiating the price cuts, imitating price increases, responding to Competitor's price changes.	**Hours – 10**
Unit – 4	
Marketing Communication: the communication process, Communication mix, Managing advertising sales promotion, Public relations and Direct Marketing. Sales force Objectives, Sales force structure and size, Sales force Compensation.	**Hours –10**
Unit – 5	
Marketing Organization and Control: Evolution of Marketing Department, Organizing the Marketing Department, Marketing Implementation, Control of Marketing Performance, Annual Plan Control, Profitability Control, Efficiency Control, Strategic Control.	**Hours – 10**

COURSE OUTCOMES:

- Understand the concepts of marketing and the marketing system
- Understand the marketing environment and its relevance to marketing deisions
- Clearly understand of the marketing mix and functions

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. Phillip Kotler: "**Marketing Management** ", Pearson Publishers, New Delhi, 2013.
2. RajanSexena: "**Marketing Management**", Tata McGraw Hill, New Delhi, 2012.
3. R.Srinivasan: "**Case Studies in Marketing**", PHI Learning, New Delhi, 2012
4. V.S.Rama Swamy, S. Nama Kumari, Marketing Management, McGraw Hill, 2013
5. PingaliVenuGopal, Marketing Management A Decision Making Approach, *Response Books,* 2010.
6. Lamb, Hair, Sharma: "**MKTG**" Cengage Learning , New Delhi, 2013

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	2	-	-	-	-	3	-	-
2	-	3	-	-	3	-	-	-
3	-	-	-	-	2	3	-	-
4	-	-	-	-	-	-	3	-
5	-	-	-	-	3	-	-	-

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HUMAN RESOURCE MANAGEMENT			
Subject Code	**18MS02T3**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	04	Exam Hours	03
Credits – 03			

COURSE OBJECTIVES:

1. To understand the concept of Human Resource.
2. To understand HR functions & its implementation process in the firm.
3. To know the various methods to settle the disputes & different Trade unions.

Unit -1	
HRM: Significance - Definition and Functions – evolution of HRM- Principles - Ethical Aspects of HRM- - HR policies, Strategies to increase firm performance - Role and position of HR department –aligning HR strategy with organizational strategy - HRM at global perspective- challenges – cross-cultural problems – emerging trends in HRM.	**Hours – 10**
Unit -2	
Investment perspectives of HRM: HR Planning –demand and supply forecasting - Recruitment and Selection- sources of recruitment - Tests and Interview Techniques - Training and Development – methods and techniques– training evaluation - retention - Job Analysis – job description and specifications. Management development - HRD concepts – mechanisms – career planning and counseling.	**Hours – 10**
Unit – 3	
Performance Evaluation: Importance – methods – traditional and modern methods – Latest trends in performance appraisal - Career Development and Counseling- Compensation, Concepts and Principles- Influencing Factors- Current Trends in Compensation- Methods of Payments - compensation mechanisms at international level.	**Hours – 10**
Unit – 4	
Wage and Salary Administration: Concept- Wage Structure- Wage and Salary Policies- Legal Frame Work- Determinants of Payment of Wages- Wage Differentials - Job design and Evaluation- - Incentive Payment Systems. Welfare management: Nature and concepts – statutory and non-statutory welfare measures – incentive mechanisms.	**Hours –10**
Unit – 5	
Managing Industrial Relations: Trade Unions-Employee Participation Schemes-Collective Bargaining–Grievances and disputes resolution mechanisms. –Safety at work – nature and importance – work hazards – safety mechanisms - Managing work place stress. HR accounting and auditing: Nature and significance –problems – HR audit - process – HRIS - methods.	**Hours – 10**

Relevant cases have to be discussed in each unit and in examination case is compulsory

from any unit.
COURSE OUTCOMES: 1. Able to understand the concept of Human Resource Management. 2. Able to understand the HR functions & its implementation process in the firm. 3. Able to know the various disfare settlement methods & different trade unions.
QUESTION PAPER PATTERN: **SECTION A:** • Five one page answer questions from each unit. **SECTION B:** • Three easy type questions out of five questions. **SECTION C:** • Case Study (Compulsory question)
REFERENCE BOOKS: 1. K Aswathappa: "***Human Resource and Personnel Management***", Tata McGraw Hill, New Delhi, 2013 2. Subba Rao P: "***Personnel and Human Resource Management-Text and Cases***", Himalaya Publications, Mumbai, 2013. 3. N.Sambasiva Rao and Dr. Nirmal Kumar: "**Human Resource Management and Industrial Relations**", Himalaya Publishing House, Mumbai 4. Mathis, Jackson,Tripathy:"***Human Resource Management:Asouth-Asin Perspective***", Cengage Learning, New Delhi, 2013 5. Jayant Mukherjee, Designing Human Resource Management Systems, A Leader's Guide, *Sage International* 6. Garry Dessler, Human Resource Management, 12th Edition, *Pearson Education,*

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	3	-	-	-	3	-	-	-
2	-	-	-	-	3	-	-	-
3	-	-	-	-	3	-	-	-
4	-	-	-	3	-	-	-	-
5	-	-	-	-	3	-	-	-

3 – High; 2 – Medium; 1 – Low; 0 = No Matching

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Department of Management Science

Syllabus- MBA II Semester for the Autonomous Batch starting from A.Y. 2018-19

ORGANISATIONAL BEHAVIOUR			
Subject Code	**18MS02T6**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	04	Exam Hours	03
Credits – 03			

Course Objectives

- To demonstrate the key concepts of Organisational Behaviour
- To describe the concepts Organizational Culture, Design and Development

Unit – I	
Introduction - Nature and scope – linkages with other social sciences - Individual Roles and Organizational Goals - Perspectives of Human Behavior, Approach to Organizational behavior - models of organizational behavior.	**10 hours**
Unit – II	
Perceptual Management: Nature - Process – selection, organization and interpretation – Influencing factors -Motivation – Concepts - Needs and Motives and theories. Leadership and Motivating people - Leadership Theories. Attitudes and Values: formation - Types – Changes and Behavior Modification Techniques.	**10 hours**
Unit – III	
Personality Development: Nature - Stages, Determinants of Personality, - Johari Window - Transactional Analysis, Learning Processes - Theories, Creativity and Creative - Thinking. Leadership nature and skills. - Decision Making Process: Behavioral Dimensions, Groups and their formation - Group Dynamics, Informal Organizations, Group versus Individual Interaction.	**10 hours**
Unit – IV	
Inter-Personal Communication: Listening, Feedback, Collaborative Processes in Work Groups, Team Building, Team Decision Making, Conflict Resolution in Groups and Problem Solving Techniques.	**10 hours**
Unit – V	
Organizations: Determinants of Structure, Functional Aspects of Structure,. Principles and Design of Organizations, Organizational Culture, Power and Authority. Stress in Organization. Organizational Development processes, Change – Resistance to Change.- Interventions, OD techniques and applications.	**`10 hours**

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

COURSE OUTCOMES:

- Understand the principles and concept of organisational behaviour
- Familiar the concepts of Organizational Culture, Design and Development

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

Reference Books

1. K.Aswathappa: "Organizational Behavior-Text, Cases and Games", Himalaya Publishing House, New Delhi, 2008,
2. Jai B.P.Sinha: "Culture and Organizational Behavior", Sage Publication India Private Limted, New Delhi, 2008.
3. P. Subba Rao, Organizational Behaviour, Himalaya Publishing House, 2009, Mumbai
4. Steven L McShane, Mary Ann Von Glinow, Radha R Sharma: "Organizational Behavior", Tata McGraw Hill Education, New Delhi, 2008.
5. Jerald Greenberg and Robert A Baron: "Behavior in Organizations", PHI Learning Private Limited, New Delhi, 2009.
6. PareekUdai: "Understanding Organizational Behavior", Oxford University Press, New Delhi, 2007.
7. John W. New Strom, Keith A. Davis, Organisational Behaviour: Human Behaviour at Work, *McGraw Hill Higher Education,* 2001.

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	-	-	-	3	-	-	-	2
2	-	3	-	-	3	-	-	-
3	-	3	-	-	-	-	-	-
4	-	-	-	-	-	-	3	-
5	-	-	-	-	-	-	-	2

3 – High; 2 – Medium; 1 – Low; 0 = No Matching

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Department of Management Science

Syllabus- MBA III Semester for the Autonomous Batch starting from A.Y. 2018-19

STRATEGIC MANAGEMENT			
Subject Code	**18MS03T1**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	04	Exam Hours	03
Credits – 03			

COURSE OBJECTIVES:

- To enable students have a grasp of various business strategies in general and functional management areas.
- To discuss the importance of Environmental Scanning in Strategic formulation
- To give a snapshot on strategy formulation and strategy implementation process

Unit -1	
Introduction: Concepts in Strategic Management, Strategic Management as a process – Developing a strategic vision, Mission, Objectives, and Policies – Factors that shape a company's strategy – Crafting a strategy - Industry and Competitive Analysis.	**Hours – 10**
Unit -2	
Environmental Scanning and Leadership: Methods. SWOT Analysis –Strategies and competitive advantages in diversified companies and its evaluation. Strategic Analysis and Choice: Tools and techniques- Strategic Leadership: Leadership and Style – Key Strategic Leadership Actions - Developing Human Capital and Social Capital – Balanced Scorecard.	**Hours – 10**
Unit – 3	
Strategy Formulation: Strategy Framework For Analyzing Competition, Porter's Value Chain Analysis, Competitive Advantage of a Firm, Exit and Entry Barriers - Formulation of strategy at corporate, business and functional levels. Types of Strategies – Tailoring strategy to fit specific industry – restructuring and diversification strategies – different methods Turnaround strategy and diversification strategies.	**Hours – 10**
Unit – 4	
Strategy Implementation : Strategy and Structure, Leadership, culture connection - Strategies for competing in Globalizing markets and internet economy – Organizational Values and Their Impact on Strategy – Resource Allocation – Planning systems for implementation.	**Hours –10**
Unit – 5	
Strategy Evaluation and control – Establishing strategic controls - Measuring performance – appropriate measures- Role of the strategist – using qualitative and quantitative benchmarking to evaluate performance - strategic information systems – problems in measuring performance – Strategic surveillance -strategic audit.	**Hours – 10**

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

COURSE OUTCOMES:

- Students have a knowledge of various business strategies in general and functional management areas.
- Know the importance of Environmental Scanning in Strategic formulation
- Understand the strategy formulation and strategy implementation process

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. AzharKazmi, Strategic Management and Business Policy, McGraw Hill, 2008
2. UpendraKachru, Strategic Management, Excel Books, 2009
3. Vijaya Kumar P,.Hitt A : **Strategic Management**, Cengage learning, New Delhi,2010
4. John A PearceII, AmitaMital: **"Strategic Management"**, TMH, New Delhi, 2012.
5. Sanjay Mohapatra: **"Cases Studies in Strategic Management"**, Pearson, New Delhi,2012
6. Adrian Haberberg&Alison: **Strategic Management**, Oxford University Press, New Delhi, 2010

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	3	3	-	-	-	-	-	-
2	-	3	-	-	-	-	-	-
3	-	3	-	-	-	-	-	-
4	-	-	-	-	3	-	-	-
5	-	3	-	-	-	-	-	-

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Department of Management Science

Syllabus- MBA III Semester for the Autonomous Batch starting from A.Y. 2018-19

BUSINESS ETHICS & CORPORATE GOVERNANCE			
Subject Code	**18MS03T3**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	04	Exam Hours	03
Credits – 03			

COURSE OBJECTIVES:

- To make students understand the importance of Ethics
- To make students aware of good Business and Corporate Governance

Unit -1	
Importance of Business Ethics: Values and Ethics- Business Ethics and Law – Ethics in Work Place – Ethical Decision Making- Theories of Business Ethics – Management and Ethics- Indian Ethical Traditions	**Hours – 10**
Unit -2	
Impact of Globalization on Indian Business Ethics: Reasons for Unethical Practices among Indian companies – Development of Indian Capital Markets – Various studies on Ethical Attitudes of Managers Major Indian Scams	**Hours – 10**
Unit – 3	
Ethics in Marketing, HRM and Finance: Product safety and Pricing-Ethical responsibility in Product- Advertising and Target Marketing Ethics of sales, advertising and product placement and Consumer Autonomy. Ethics in HRM & Finance – HR related ethical issues - Institutional Culture – Frauds in Banks - Measures against Bank Frauds – Frauds in Insurance sector	**Hours – 10**
Unit – 4	
Corporate Governance: An overview – Theory and Practice of Governance- Indian model of Governance- Good Corporate Governance – Land marks in emergence of Governance OECB Principles – Sarbanes-Oxley Act 2002- SEBI Initiatives	**Hours –10**
Unit – 5	
Corporate Governance Indian Scenario: Role of Government in Ensuring Corporate Governance – Governance issues relating to Board of Directors – Duties and responsibilities of Auditors – Governance under limited competition – Role of Media – Corporate Governance in Developing and Transiting Economies.	**Hours – 10**

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

COURSE OUTCOMES:

- Ability to understand the importance of Ethics
- Students aware of good Business and Corporate Governance

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. A.C. Ferando, Business Ethics, Perason Education, 2009
2. SK Mandal, Business Ethics & Corporate Governance, McGraw Hill2010
3. A.C. Fernando, Corporate Governance, Person Education, 2010

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	-	3	-	-	-	-	-	3
2	-	-	-	3	-	-	-	-
3	-	-	-	-	-	3	-	-
4	-	3	-	-	3	-	-	-
5	-	-	-	-	3	-	-	-

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Department of Management Science

Syllabus- MBA III Semester for the Autonomous Batch starting from A.Y. 2018-19

STRATEGIC FINANCIAL MANAGEMENT			
Subject Code	**18MS03F7**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	04	Exam Hours	03
Credits – 03			

COURSE OBJECTIVES:

- To acquaint the students with concepts of Financial management from strategic perspective and
- To familiarize various Techniques and Models of Strategic Financial Management.

Unit -1	
Corporate Policy: Strategic Financial Planning- changing complexion of regulatory framework - Shareholder Value Creation (SCV): Market Value Added (MVA) – Market-toBook Value (M/BV) – Economic Value Added (EVA) – Managerial Implications of Shareholder Value Creation- Corporate Risk Management – Understanding the firms Strategic Exposure.	**Hours – 10**
Unit -2	
Corporate Financial Strategies: Capital Structure Planning- EBIT,EPS,ROE analysis- Shareholders' Risk — Financial Options and Value of the Firm – Dividend Policy and Value of the Firm – Growth and External Financing Requirement. (Problems)	**Hours – 10**
Unit – 3	
Corporate Investment Strategy: Techniques of Investment Appraisal Under Risk and Uncertainty – Risk Adjusted Net Present Value – Risk Adjusted Internal Rate of Return – Capital Rationing – Decision Tree Approach for Investment Decisions – Evaluation of Lease Vs Borrowing Decision- Long term investment plans analysis with risk and return. (Problems)	**Hours – 10.**
Unit – 4	
Corporate Financial Engineering: Merger Strategy – Theories of Mergers – Horizontal and Conglomerate Mergers – Merger Procedure – Valuation of Firm – Financial Impact of Merger – Merge and Dilution Effect on Earnings Per Share – Merger and Dilution Effect on Business Control. (Problems)	**Hours –10**
Unit – 5	
Corporate Restructuring: Takeover Strategy – Types of Takeovers – Negotiated and Hostile Bids – Takeover Procedure – Takeover Defenses – Takeover Regulations of SEBI – Distress Restructuring Strategy – Sell offs – Spin Offs – Leveraged Buyouts- Buy back shares – Alignment of Interest – Corporate Governance . (Problems)	**Hours – 10**

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

COURSE OUTCOMES:

- Understand the concepts of Financial management from strategic perspective

- Familiarize various Techniques and Models of Strategic Financial Management.

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. AswathDamodaran, Corporate Finance, Theory and Practice, Wiley India Private Limited.
2. Preeti Singh: Investment Management, Himalaya Publishing House, New Delhi, 2009
3. M.Ranganadham: Investment Analysis and Portfolio Management , Pearson Education, New Delhi, 2009
4. Prasanna Chandra , Projects: Planning, Analysis, Financing Implementation and Review, 5/e TMH, New Delhi, 2003
5. V.K. Bhalla, Financial Management and policy.,Anmol Publications Pvt. Ltd.

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	-	-	-	-	-	3	-	-
2	-	-	-	-	3	-	-	-
3	-	3	-	-	-	-	-	-
4	-	3	-	-	-	-	-	-
5	-	3	-	-	-	-	-	-

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REGULATIONS, COURSE STRUCTURE AND SYLLABUS

(Aligned with AICTE Model Curriculum & APSCHE Curriculum)

SITE 18M REGULATIONS

For

B.Tech.

Civil Engineering

With effective from the Academic Year

2020-21

COURSE STRUCTURE AND DETAILED SYLLABUS

For Civil Engineering

B.Tech.-SITE18M

Regulations

With Effective from the Academic Year

2020-2021

B. Tech. (Civil Engineering)
Semester I (First Year)

S. No	Course Category	Course Code	Subjects	Hours Per Week			Credits
				L	T	P	
1	HSMC	18CMEGT1010	Technical English	3	0	0	3
2	BSC	18CMMAT1020	Engineering Mathematics-I	3	1	0	4
3	BSC	18CMCHT1030	Engineering Chemistry	3	1	0	4
4	ESC	18CMEET1040	Basic Electrical Engineering	3	1	0	4
5	HSMC	18CMEGL1050	English Communication skills lab	0	0	2	1
6	BSC	18CMCHL1060	Engineering Chemistry Lab	0	0	3	1.5
7	ESC	18CMEEL1070	Basic Electrical Engineering Lab	0	0	3	1.5
8	MC	18CMMSN1080	Constitution of India, Professional Ethics & Human Rights	3	0	0	0
						Total Credits	19

B.Tech. (Civil Engineering)
Semester II (First Year)

Sl. No.	Course Category	Course Code	Course Title	L	T	P	C
1.	BSC	18CMMAT2010	Engineering Mathematics-II	3	1	0	4
2.	BSC	18MEPHT2020	Engineering Physics	3	1	0	4
3.	ESC	18CMCST2030	Programming for Problem Solving	3	0	0	3
4.	ESC	18CMMEL2040	Engineering Graphics	1	0	4	3
5.	BSC	18MEPHL2050	Engineering Physics Lab	0	0	3	1.5
6.	ESC	18CMCSL2060	Programming for Problem Solving lab	0	0	4	2
7.	ESC	18CMMEL2070	Work Shop/Manufacturing Practice	0	0	3	1.5
8.	MC	18CMCHN2080	Environmental Science	3	0	0	0
						Total Credits	19

B.Tech. (Civil Engineering)
Semester III (Second Year)

Sl. No.	Course Category	Course Code	Course Title	L	T	P	C
1.	BSC	18CEMAT3010	Engineering Mathematics - III	3	1	0	4
2.	ESC	18CMCET3020	Engineering Mechanics	3	1	0	4
3.	PCC	18CECET3030	Engineering Geology	2	0	0	2
4.	PCC	18CECET3040	Surveying & Geomatics	3	0	0	3
5.	PCC	18CECET3050	Building materials & Concrete Technology	3	0	0	3
6.	PCC	18CECEL3060	Engineering Geology Lab	0	0	3	1.5
7.	PCC	18CECEL3070	Surveying field work Lab	0	0	3	1.5
8.	PCC	18CECEL3080	Computer- aided civil Engineering Drawing Lab	0	0	3	1.5
9.	MC	18CEECN3090	Basic Electronics	3	-	-	-
						Total Credits	**20.5**

B.Tech. (Civil Engineering)
Semester IV (Second Year)

Sl. No.	Course Category	Course Category	Course Title	L	T	P	C
1.	PCC	18CECET4010	Fluid Mechanics	3	0	0	3
2.	PCC	18CECET4020	Strength of Materials	3	0	0	3
3.	PCC	18CECET4030	Environmental Engineering	3	0	0	3
4.	PCC	18CECET4040	Transportation Engineering	3	0	0	3
5.	HSMC	18CMMST4050	Engineering Economics and Financial Management	3	0	0	3
6.	PCC	18CECEL4060	Strength of Materials Lab	0	0	3	1.5
7.	PCC	18CECEL4070	Environmental Engineering Lab	0	0	3	1.5
8.	PCC	18CECEL4080	Material Testing Lab	0	0	3	1.5
						Total Credits	**19.5**

B.Tech. (Civil Engineering)
Semester V (Third Year)

S.No	Course Category	Course Code	Subjects	Hours Per Week			Credits
				L	T	P	
1.	PCC	18CECET5010	Geo Technical Engineering	3	0	0	3
2.	PCC	18CECET5020	Theory of Structures -I	3	0	0	3
3.	PCC	18CECET5030	Hydraulic & Hydraulics Machinery	3	0	0	3
4.	PCC	18CECET5040	Reinforced Concrete Structures	3	0	0	3
5.	OE	18CExxO505x	Open Elective- I	3	0	0	3
6.	PE	18CECEP506x	Professional Elective -I	3	0	0	3
7.	PCC	18CECEL5070	Geo Technical Engineering Lab	0	0	3	1.5
8.	PCC	18CECEL5080	Fluid mechanics & Hydraulics Machinery Lab				1.5
9.	SOC	18CEAHS5090	Soft Skills & Aptitude Builder - 1	2	0	0	2
10	MC	18CMBIT5100	Biology for Engineers	2	0	0	0
						Total Credits	23

B.Tech. (Civil Engineering)
Semester VI (Third Year)

S.No	Course Category	Course Code	Subjects	Hours Per Week			Credits
				L	T	P	
1	PCC	18CECET6010	Theory of Structures -II	3	0	0	3
2	PCC	18CECET6020	Design of Steel Structures	3	0	0	3
3	OE	18CExxO603x	Open Elective- II	3	0	0	3
4	PE	18CECEP604x	Professional Elective -II	3	0	0	3
5	PE	18CECEP605x	Professional Elective- III	3	0	0	3
6	PCC	18CECEL6060	Structural Design and Drawing Lab	0	0	3	1.5
7	PCC	18CECEL6070	Software Applications in civil Engineering Lab	0	0	3	1.5
8	PCC	18CECEL6080	Surveying Field Camp	1	0	2	2
9	SOC	18CEAHS6090	Soft Skills & Aptitude Builder - 2	2	0	0	2
						Total Credits	22

B.Tech. (Civil Engineering)
Semester VII (Fourth Year)

S.No	Course Category	Course Code	Subjects	Hours Per Week			Credits
				L	T	P	
1	PCC	18CECET7010	Contracts, Specifications & Project Management	3	0	0	3
2	PCC	18CECET7020	Hydrology and Water Resource Engineering	3	0	0	3
3	OE	18CExxO703x	Open Elective III	3	0	0	3
4	OE	18CExxO704x	Open Elective IV	3	0	0	3
5	PE	18CECEP705x	Professional Elective IV	3	0	0	3
6	PE	18CECEP706x	Professional Elective V	3	0	0	3
7	PCC	18CECEL7070	Irrigation Engineering & Drawing Lab	0	0	4	2
8		18CECEL7080	Internship with Seminar	0	0	3	3
9	SOC	18CECES7090	STAAD.Pro	1	0	2	2
						Total Credits	25

Semester VIII (Fourth Year)

S.No	Course Category	Course Code	Subjects	Hours Per Week			Credits
				L	T	P	
1.			Project	0	0	0	12

Professional Elective Courses:

Elective -I	18CECEP506a	Solid and Hazardous Waste management
	18CECEP506b	Architecture & Town Planning
	18CECEP506c	Advanced Transportation Engineering
	18CECEP506d	Sustainable construction methods for buildings
Elective -II	18CECEP605a	Transportation Economics
	18CECEP605b	Advanced Concrete Technology
	18CECEP605c	Remote Sensing & GIS Applications
	18CECEP605d	Foundation Engineering
Elective -III	18CECEP606a	Ground Improvement Techniques
	18CECEP606b	Surface water Hydrology
	18CECEP606c	Offshore Engineering
	18CECEP606d	Rural Water Supply and Onsite Sanitation Systems
Elective -IV	18CECEP705a	Advanced Structural Analysis
	18CECEP705b	Environmental Impact Assessment and Environment Management Planning
	18CECEP705c	Engineering with Geo-synthetics
	18CECEP705d	Urban Hydrology
Elective -V	18CECEP706a	Pre-Stressed Concrete
	18CECEP706b	Repairs and Rehabilitation of Structures
	18CECEP706c	Ground Water Development & Management
	18CECEP706d	Air and Noise Pollution and Control

Open Elective Courses offered by Dept. of CE to Other Depts.

1	18xxCEOxxxx	Civil Engineering Societal & Global Impact
2	18xxCEOxxxx	Introduction to Civil Engineering
3	18xxCEOxxxx	Disaster Management
4	18xxCEOxxxx	Environmental Pollution and Control
5	18xxCEOxxxx	Building Materials
6	18xxCEOxxxx	Green Buildings and Sustainability

M. Rama Rao
HoD

Head of the Dept - Civil
Sasi Institute of Technology & Engineering
TADEPALLIGUDEM - 534 101
W.G.Dist..A.P

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS

Common to all

Subject Code	18CMMSN1080	IA Marks	30
Number of Lecture Hours/Week	3+1(T)	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 00

COURSE OBJECTIVES:

The objectives of this course help the students to

- To provide basic information about Indian constitution.
- To identify individual role and ethical responsibility towards society.
- To understand human rights and its implications.

Unit -1	
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours– 10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours– 10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th&91stAmendments.	**Hours– 10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchayats and Co - Operative Societies.	**Hours–10**
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours– 10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity &Reliability

Question paper pattern:

1. Question paper consists of 10 questions.
2. Each full question carrying 14 marks.
3. Each full question will have sub question covering all topics under a unit.
4. The student will have to answer 5 full questions selecting one full question from each unit.

Text Books:

1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice –Hall EEE, 19th / 20thEdn.,2001
2. Charles E. Haries, Michael S Pritchard and Michael J.Robins**"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing,2002.
2. M. Govindarajan, S. Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi,2004
3. Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi,2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources

1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

COURSE OUTCOMESTOPROGRAMOUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Course	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**5**	**-**		**-**	**-**	**-**	**-**	**-**

ENVIRONMENTAL SCIENCE			
Subject Code	18CMCHN2080	IA Marks	30
Number of Lecture Hours/Week	04	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 00

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -1	
MULTIDISCIPLINARYNATUREOF ENVIRONMENTALSTUDIES **Environment-**Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. -Food chains, food webs and ecological pyramids. Introduction, types, characteristic features,structure and function of the different ecosystems	**Hours– 10**
Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems –Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**Hours– 12**
Unit -3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographically classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega- diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**Hours– 6**
Unit -4	
ENVIRONMENTAL POLLUTION	**Hours– 12**

Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	
Unit -5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act - Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. - Study of simple ecosystems - pond, river, hill slopes, etc.	**Hours– 10**
COURSE OUTCOMES: On completion of the course student will be 1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges. 2. Able to understand the concept of eco system and its diversity. 3. Able to gain knowledge on natural resources. 4. Able to understand the concept of biodiversity. 5. Able to gain knowledge on environmental pollution. 6. Gain knowledge on environmental legislation and global treaties.	
Question paper pattern: 1. Question paper consists of 10 questions. 2. Each full question carrying 14 marks. 3. Each full question will have sub question covering all topics under a unit. 4. The student will have to answer 5 full questions selecting one full question from each unit.	
TEXT BOOKS: 1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi. 2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi 3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall ofIndia, New Delhi	
REFERENCE BOOKS: 1. Text Book of Environmental Studies by Deeshita Dave&P. UdayaBhaskar, Cengage Learning. 2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada. 3. Environmental Studies, P.N. Paliniswamy, P. Manikandan,A. Geeta and K. Manjula Rani, Pearson Education, Chennai.	

Course Outcomes to Program Outcomes Mapping:

CO	PO1	PO2	PO 3	PO4	PO5	PO6	PO7	PO 8	PO9	PO 10	PO11	PO12	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-
6	-	3		-	-	-	-	-	-	-	-	-	-	-	-
Course	3	3	3	-	-	-	3	-	-	-	-	-	-	-	-

ENVIRONMENTAL ENGINEERING SEMESTER - IV			
Subject Code	**18CECET4030**	IA Marks	30
Number of Lecture Hours/Week	03	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 03

Course Objectives:

This course will enable students to:

1. Outline planning and the design of water supply systems for a community/town/city
2. Provide knowledge of water quality requirement for domestic usage and other usage
3. Impart understanding of importance of protection of water source quality
4. Selection of valves and fixture in water distribution systems for water supply system.
5. Impart knowledge on design of water distribution network

Unit -1 Introduction	
Water:- Water Supply systems, Need for planned water supply schemes, Sources of Water, Water demand and Potable, industrial and agricultural water requirements. Role of Environmental Engineer.	**Hours – 08**
Unit -2 Importance and Necessity of Protected Water Supply systems	
Importance and Necessity of Protected Water Supply systems, Water borne diseases, Flow chart of public water supply system, Agency activities Water Demand and Quantity Estimation: Estimation of water demand for a town or city, Per capita Demand and factors influencing it - Types of water demands and its variations- factors affecting water demand, Design Period, Factors affecting the Design period, Population Forecasting.	**Hours – 12**
Unit – 3 Treatment of Water:	
Treatment of Water: Flowchart of water treatment plant, Treatment methods: Theory and Design of Sedimentation, Coagulation, Sedimentation with Coagulation, Filtration. Disinfection: Theory of disinfection-Chlorination and other Disinfection methods, Softening of Water, Removal of color and odours - Iron and manganese removal – Adsorption-fluoridation and deflouridation–aeration– Reverse Osmosis-Iron exchange–Ultra filtration	**Hours – 10**
Unit – 4 Sewage	
Sewage- Domestic and Storm water, Quantity of Sewage, Sewage flow variations. Conveyance of sewage- Sewers, shapes design parameters, operation and maintenance of sewers, Sewage pumping; Sewerage, Sewer appurtenances, Design of sewerage systems. Storm Water- Quantification and design of Storm water; Sewage and Sullage, Pollution due to improper disposal of sewage, National River cleaning plans, recycling of sewage – quality requirements for various purposes.	**Hours – 10**
Unit – 5 Building Plumbing	
Building Plumbing-Introduction to various types of home plumbing systems for water supply and waste water disposal, high rise building plumbing, Pressure reducing valves, Break pressure tanks, Storage tanks, Building drainage for high rise buildings, various kinds of fixtures and fittings used. Government authorities and their roles in water supply, sewerage disposal. Distribution of Water: Requirements- Methods of Distribution system, Layouts of Distribution networks, Pressures in the distribution layouts	**Hours – 10**

Course outcomes:

On completion of the course, student will be able to

1. Plan and design the water and distribution networks and sewerage systems
2. Identify the water source and select proper intake structure
3. Characterization of water
4. Select the appropriate appurtenances in the water supply
5. Selection of suitable treatment flow for raw water treatments
6. Analyze the suitability of water distribution methods in various regions.

Text Books:

1. Introduction to Environmental Engineering by P. Aarne Vesilind, Susan M. Morgan, Thompson / Brooks/Cole; Second Edition 2008
2. Introduction to Environmental Engineering, Vesilind, PWS Publishing Company 2000

Reference Books:

1. Water Supply and Sewerage, E.W. Steel
2. CPHEEO Manual on Water Supply & Treatment
3. Manual on Water Supply and Treatment, (latest Ed.), Ministry of Works & Housing, New Delhi.
4. Plumbing Engineering. Theory, design and Practice, S.M. Patil, 1999
5. Integrated Solid Waste Management, Tchobanoglous, Theissen & Vigil. McGraw Hill Publication
6. Environmental Engineering by H.S.Peavy, D.R. Rowe, G.Tchobanoglous; 1991, Tata-McGraw

ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT SEMESTER IV			
Subject Code	**18CMMST4050**	IA Marks	30
Number of Lecture Hours/Week	03	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course objectives:
This course will enable the students to

1. Understand the concept and nature of Managerial Economics and Concept of Demand and Demand forecasting.
2. Analyse the Cost Concepts, Cost-Volume-Profit Analysis and Market structures.
3. Learn different Accounting Systems, preparation of Financial Statements and Capital Budgeting proposals by using different methods.

Unit -1	
Introduction to Managerial Economics and demand Analysis: Definition of Managerial Economics and Scope-Managerial Economics and its relation with other subjects-Concept of Demand-Types-Determents-Law of Demand its Exception-Elasticity of Demand-Types and Measurement- Demand forecasting and its Methods.	**Hours – 10**
Unit –2	
Production and Cost Analysis: Production function-Isoquants and Isocost-Law of Variable proportions- Cobb-Douglas Production function- Economics of Sale-Cost Concepts- Opportunity Cost-Fixed vs Variable Costs-Explicit Costs vs Implicit Costs- Cost Volume Profit analysis- Determination of Break-Even Point	**Hours – 10**
Unit-3	
Introduction To Markets, Pricing Policies & forms Organizations and Business Cycles: Market Structures: Perfect Competition, Monopoly and Monopolistic and Oligopoly – Features – Price Output Determination – Methods of Pricing: Market Skimming Pricing, And Internet Pricing: Flat Rate Pricing. Features and Evaluation of Sole Trader – Partnership – Joint Stock Company – State/Public Enterprises and their forms – Business Cycles – Meaning and Features – Phases of Business Cycle	**Hours – 12**
Unit –4	
Introduction to Accounting & Financing Analysis: Introduction to Double Entry Systems– Preparation of Financial Statements- Analysis and Interpretation of Financial Statements-Ratio Analysis (Simple Problems)	**Hours – 10**
Unit-5	
Capital and Capital Budgeting: Capital Budgeting: Meaning of Capital-Capitalization- Meaning of Capital Budgeting-Need for Capital Budgeting-Techniques of Capital Budgeting- Traditional and Modern Methods.	**Hours – 08**

Course outcomes:
On completion of the course student will be able to:

1. Equipped with the knowledge of managerial economics and estimating demand for a product.
2. Examine the Production Concept and familiar with the concepts of iso-quants, iso-cost lines and MRTS
3. Predict the cost of production and its relevance to managerial decision making
4. Prepare Financial Statements along with Analysis
5. Analyse and interpret various investment project proposals with the help of Capital Budgeting

techniques.

Text Books:

1. Dr. A. R. Aryasri – Managerial Economics and Financial Analysis, TMH 2011.
2. Dr. B. Kuberudu and Dr. T. V. Ramana: Managerial
3. Economics & Financial Analysis, Himalaya Publishing House 2011.

Reference Books:

1. Dr. P. Vijaya Kumar & Dr. N. Apparao Management Science Cengage, Delhi, 2012.
2. S. A. Siddiqui & A. S. Siddiqui: Managerial Economics and Financial Analysis, New Age International Publishers, 2012
3. Vanitha Agarwal : Managerial Economics, Pearson Publications 2011.

Web References:

1. https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_MEFA_LECTURE_NOTES_1.pdf
2. https://www.edx.org/course/introduction-to-managerial- economics

(18M)

BIOLOGY FOR ENGINEERS
SEMESTER V

Subject Code	18CMMSN50A0	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	48	Exam Hours	03
Pre-requisite	Natural Science	Credits – 00	

Course Objectives:
This course will enable students to
1. Understand biology as an independent scientific discipline.
2. Understand the Hierarchy of life forms at various phenomenological level
3. Understand Gene and gene mapping
4. Understand molecules of life and enzymes
5. Understand proteins and enzymology
6. Understand microbiology and metabolis

Unit -1	**Hours**
Introduction- Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor.	8
Unit -2	
Classification- Hierarchy of life forms at phenomenological level- classification based on (a) cellularity- Unicellular or multicellular (b) ultra-structure- prokaryotes or eucaryotes. (c) energy and Carbon utilization - Autotrophs, heterotrophy, lithotropes (d) Ammonia excretion – aminotelic, uricoteliec, ureoteli (e) Habitata - acquatic or terrestrial (f) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D.Melanogaster, C. elegance, A. Thaliana, M. Musculus	10
Unit -3	
Genetics - Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be given not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	10
Unit – 4	
Enzymes: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification- Mechanism of enzyme action. - examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins:** Proteins- structure and function. Hierarchy in protein structure. Primary secondary, tertiary and Quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a	10

genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of genetic code. Define gene in terms of complementation and recombination	
Unit-5	
Microbiology & Metabolism: Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergonic reactions. Concept of Keq and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to CO2 + H2O (Glycolysis and Krebs cycle) and synthesis of glucose from CO2 and H2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms**. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10
Total	**48**

Course outcomes:

On completion of the course student will be able to

1. Able to describe how biological observations of 18th Century that lead to major discoveries.
2. Able to convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological
3. Able to demonstrate the highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring.
4. Able to convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine.
5. Able to classify enzymes and distinguish between different mechanisms of enzyme action.
6. Able to demonstrate that "Genetics is to biology what Newton's laws are to Physical Sciences".

Text Books:

1. Campbell, N. A, Reece, J. B, Urry, Lisa Cain, M, L. Wasserman, S. A. Minorsky, P. V. Jackson, R. B, Biology: A Global Approach: Pearson Education. Pearson Publishers, 11th Edition,2017
2. Conn, E.E, Stumpf, P.K, Bruening, G. Doi, R.H, Outlines of Biochemistry, John Wiley and Sons, 1987
3. L.M J.P. Harley and C.A. Klein, Microbiology, C. Brown Publishers, 2nd Edition, 1995.

Reference Books:

1. Nelson, D. L. and Cox, M. M, Principles of Biochemistry, W.H. Freeman and Company, 7th Edition, 2017
2. Stent, G. S, Richard Calender, Molecular Genetics: An Introductory Narrative, W.H. Freeman and Co., 1978

SOLID AND HAZARDOUS WASTE MANAGEMENT SEMESTER – V			
Subject Code	**18CECEP506a**	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course Objectives:

This course will enable students to:

1. Impart the basic knowledge of solid waste management.
2. Know the various methods solid waste collection.
3. Knowledge about waste minimization.
4. Study the design and operation of solid waste disposal.
5. Understand the hazardous waste management techniques.

Unit -1	**Hours**
Introduction to Solid Waste Management: Goals and objectives of solid waste management, Classification of Solid Waste - Factors Influencing generation of solid waste - sampling and characterization –Future changes in waste composition, major legislation, monitoring responsibilities, Terms related ISWM like WTE, ULB, TLV etc..	**10**
Unit -2	
Basic Elements in Solid Waste Management: Elements and their inter relationship – principles of solid waste management- onsite handling, storage and processing of solid waste Collection of Solid Waste: Type and methods of waste collection systems, analysis of collection system - optimization of collection routes– alternative techniques for collection system.	**10**
Unit – 3	
Transfer, Transport and Transformation of Waste: Need for transfer operation, compaction of solid waste - transport means and methods, transfer station types and design requirements. Unit operations used for separation and transformation: shredding - materials separation and recovery, source reduction and waste minimization. Warm composting, vermin composting	**10**
Unit – 4	
Disposal of Solid Waste: Methods of Disposal, Landfills: Site selection, design and operation, drainage and leachate collection systems –designated waste landfill remediation. Case studies.	**10**
Unit – 5	
Hazardous Waste Management: sources, collection, transport, treatment and disposal methods. Incineration, Biomedical waste management, e-waste management and nuclear waste management.	**10**

Course outcomes:

On successful completion of this course, students will be able to

1. Understand the different solid waste management techniques.
2. Choose appropriate method of solid waste.
3. Suggest the solid waste minimization technique.
4. Design the solid waste management method.
5. Suggest the appropriate hazardous waste management technique.

Text Books:

1. Integrated Solid Waste Management, George Techobanoglous, McGraw Hill Publication, 1993
2. Solid Waste Engineering, Vesilind, P.A., Worrell, W., Reinhart, D., Cenage learning, New Delhi, 2004
3. Hazardous Waste Management, Charles A. Wentz, McGraw Hill Publication, 1995

Reference Books:

1. Solid and Hazardous Waste Management PM Cherry, CBS Publishers and Distriburs. New Delhi, 2016.
2. Solid Waste Engineering, William A Worrell, P Aarue Vesilind, Cengage Learning, New Delhi 2016.

SUSTAINABLE CONSTRUCTION METHODS FOR BUILDINGS SEMESTER - V			
Subject Code	**18CECEP506d**	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course Learning Objectives:

This course will enable students to:

1. Know the factors to be considered in planning and construction of buildings.
2. Familiarize the precast construction practices and techniques
3. Know building form work and staging
4. Know about cutting edge sustainable construction materials.
5. Acquaint with the techniques of fire resistance and thermal insulation

Unit -1	**Hours**
Functional Planning of buildings: General aspects to consider for planning, bye-laws and regulations, Selection of site for building construction, Principles of planning, Orientation of building and its different elements, Components of building	**10**
Unit -2	
Types of foundations and construction methods: Basics of form work and staging, common building construction methods(conventional walls and slab, conventional framed structure with block work walls), Modular construction methods for repetitive works , precast concrete construction methods, , Basics of slip form for tall Structures , Basics of construction methods for bridges.	**10**
Unit – 3	
Precast Doors and Windows: Location of roofs and windows, Definition of technical terms, Size of doors and windows, Door frames, Types of doors and windows, Ventilators, Fixtures and fastenings. Floors and Roofs: Components of a floor, materials used for floor construction, Different types of flooring, Ground floor and upper floors, Types of roofs, Basic roofing elements and Roof coverings.	**10**
Unit – 4	
Identification of cutting edge sustainable construction materials, technologies and project management strategies for use in the construction industry and evaluation of their potential to reduce the negative Environmental impacts of construction activity Masonry.	**10**
Unit – 5	
Fire protection and Thermal insulation: Causes and effect of dampness on buildings, Fire hazards, Grading of buildings according to fire resistance, Fire resisting properties of common building materials, Fire resistant construction, General methods of thermal insulation and thermal insulating materials, Safety and Security measures..	**10**

Course outcomes:

On successful completion of this course, students will be able to

1. Identify the factors to be considered in planning and construction of buildings.
2. Understand the precast construction practices and techniques
3. Plan the building form work and staging.
4. Describe the cutting edge sustainable materials and activities.

5. Understand the techniques of fire resistance and thermal insulation
Text Books: 1. Varghese P. C. Building construction, PHI Learning Pvt. Ltd., 2008. 2. Punmia B. C., Jain A. J. and Jain A. J. Building construction, Laxmi Publications, 2005.
References: 1. Arora S. P., and Bindra S. P. The text book of building construction, Dhanpat Rai Publications, 2010.

ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENT MANAGEMENT PLANNING SEMESTER – VII			
Subject Code	**18CECEP705b**	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course Objectives:

This course will enable students to:

1. Impart knowledge on different concepts of Environmental Impact Assessment.
2. Know the procedures of risk assessment.
3. Learn the EIA methodologies and the criterion for the selection of EIA methods.
4. Learn the pre requisites for ISO certification.
5. Learn the procedures for Environmental clearance and audit.
6. Appreciate the importance of stake holders participation in EIA

Unit -1	
Basic Concepts of EIA: Elements of EIA, Factors affecting EIA, Factors affecting EIA, Classification of Environmental parameters, Role of stake holders in the EIA preparation, stages in EIA- preparation of EIA base map.	**Hours – 10**
Unit -2	
EIA-Methodologies: Introduction, Criteria for the selection of the EIA methodology, EIA methods-Ad-hoc method, Matrix method, Network method, Environmental Media Quality Index method, Overlay method, Cost/Benefit Analysis-EIS & EMP.	**Hours – 10**
Unit – 3	
Impact of Development activities and Land use change: Introduction and methodology for assessment of soil and water-Delineation of study area, identification of activities- Application of Remote sensing and GIS for EIA	**Hours – 10**
Unit – 4	
EIA with reference surface water, air and biological environment, methodology for assessment of impacts surface water environment, generalized approach for the assessment of air pollution impact, Assessment of impact development activities on vegetation and wild life, Environmental impact of deforestation.	**Hours – 10**
Unit – 5	
Environmental Risk Assessment and Risk Management in EIA: Key stages in Environmental risk assessment, Advantages of Environmental Risk Assessment, EIA Notification by Ministry of Environment and Forest (Govt. of India), Procedure for Environmental Clearance, Procedure for conducting Environmental impact assessment, evaluation of EIA report; Environmental legislation, objectives, preparation of audit report, post audit activities, Concept of ISO and IS0 14000.	**Hours – 10**

Course outcomes:

On successful completion of this course, students will be able to

1. Prepare EMP, EIS and EIA reports.
2. Identify the risks and impact of the project.
3. Select an appropriate EIA methodology.
4. Conduct and Evaluate the EIA report.
5. Estimate the cost benefit/ratio of the project.

6. Know the audit procedures in the in the impact assessment.

Text Books:

1. Environmental Impact Assessment, Canter Larry W.,McGraw-Hill Education Edi (1966)
2. Environmental Impact Assessment Methodologies, Anjaneyulu , B.S Publications, Sultan Bazar, Hyderabad.

Reference Books:

1. Environmental Science and Engineering, by J.Glynn and GarryW. Hein Ke- Prentice Hall Publishers.
2. Environmental Science and Engineering , by Suresh S.K.Dhameja-S.K.Katania & Sons Publications, New Delhi.

GROUND WATER DEVELOPMENT & MANAGEMENT SEMESTER – VII			
Subject Code	**18CECEP706c**	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course Objectives:

This course will enable students to:

1. Recognize groundwater as an important natural resource.
2. Understand flow towards wells in confined and unconfined aquifers.
3. Understand the principles involved in design and construction of wells.
4. Create awareness on improving the groundwater potential using various recharge techniques.
5. Know the importance of saline water intrusion in coastal aquifers and its control measures.
6. Understand ground water modeling.

Unit -1	
Introduction: Groundwater in the hydrologic cycle, groundwater occurrence, aquifer parameters and their determination, general groundwater flow equation. **Well Hydraulics:** Steady radial flow and unsteady radial flow to a well in confined and unconfined aquifers, Application of Darcy's law.	**Hours – 10**
Unit -2	
Well Design: Water well design-well diameter, well depth, well screen-screen length, slot size, screen diameter and screen selection, design of collector wells, infiltration gallery.	**Hours – 10**
Unit – 3	
Well Construction and Development: Water wells, drilling methods-rotary drilling, percussion drilling, well construction-installation of well screens-pull-back method, open- hole, bail- down and wash-down methods, well development-mechanical surging using compressed air, high velocity jetting of water, over pumping and back washing, well completion, well disinfection, well maintenance.	**Hours – 10**
Unit – 4	
Artificial Recharge Concept of artificial recharge of groundwater, recharge methods-basin, stream-channel, ditch and furrow, flooding and recharge well methods, recharge mounds and induced recharge **Saline Water Intrusion** Occurrence of saline water intrusion, Ghyben-Herzberg relation, Shape of interface, control of saline water intrusion.	**Hours – 10**
Unit – 5	
Groundwater Modeling and Management: Basic principles of groundwater modeling- Analog models-viscous fluid models and membrane models, digital models-Finite difference and finite element models.	**Hours – 10**

Course outcomes:

On successful completion of this course, students will be able to

1. Estimate aquifer parameters and yield of wells

2. Analyse radial flow towards wells in confined and unconfined aquifers.
3. Design wells and understand the construction practices.
4. Determine the process of artificial recharge for increasing groundwater potential.
5. Apply appropriate measures for groundwater management.
6. Develop various ground water Models.

Text Books:

1. Groundwater, Raghunath H M, New Age International Publishers,2005.
2. Groundwater Hydrology, dd D. K., Wiley India Pvt Ltd., 2014.
3. Groundwater Hydrology, dd D K and L W Mays, CBS Publications,2005.

References:

1. Groundwater Assessment and Management, Karanth K R, Tata McGraw Hill Publishing Co., 1987.
2. Groundwater Hydrology, Bouwer H, McGraw Hill Book Company, 1978.
3. Groundwater Systems Planning and Management, Willis R and W.W.G. Yeh, Prentice Hall Inc., 1986.
4. Groundwater Resources Evaluation, Waln W C, McGraw Hill Book Company, 1978

AIR, NOISE POLLUTION AND CONTROL SEMESTER – VII			
Subject Code	18CECEP706d	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course Objectives:

This course will enable students to:

1. Know the analysis of different air pollutants.
2. Know the Thermodynamics and kinetics of air pollution
3. Understand Air quality management and Emission standards
4. Understand the control of Air Pollution
5. Understand the Noise pollution, Noise standards and Control
6. Understand the air pollution control equipment.

Unit -1	
Air pollution, samples and analysis of pollutants, Conversion of ppm in $\mu g/m^3$, Definition of terms related to air pollution and control, secondary air pollutants-indoor air pollutants-climatic change and its impact –carbon trade.	**Hours – 12**
Unit -2	
Thermodynamics and kinetics of air pollution: Application in the removal of gases like SO_X, NO_X, CO and HC-Air fuel ratio- Computation and control of products of combustion, automobile pollution, odors pollution control and flares.	**Hours – 10**
Unit – 3	
Ambient Air Quality Management: Monitoring of SPM, SO_2, NO_X and CO-Stack monitoring for flue gases-micro meteorological monitoring –weather station-Emission standards- Gaussian model and fume dispersion.	**Hours – 10**
Unit – 4	
Air pollution control-Control OF NO_X & SO_X emissions-Control of particulates-control at sources, process changes, Equipment modification, design ,operation of control equipments, settling chambers, cyclone separators, fabric filters, scrubbers, electrostatic precipitators	**Hours – 10**
Unit – 5	
Noise pollution and control: Noise standards, Measurement and control methods-Reducing and residential and industrial noise-ISO-14000 series	**Hours – 8**

Course outcomes:

On successful completion of this course, students are able

1. Judge the ambient air quality based on the analysis of air pollutants
2. Apply particulate and gaseous control measures for an industry
3. Understand the flume behavior in a prevailing Environmental condition
4. Estimate carbon credits for various day to day activities
5. Describe the noise pollution measures to be taken to control the noise pollution.
6. Select the proper noise control measures

Text Books:

1. Air Pollution and Control, K.V.S.G. Murali Krishna, Laxmi Publications, New Delhi,2015
2. Air Pollution, M. N. Rao and H. V. N. Rao, Tata McGraw Hill Company.

Reference Books:

1. An Introduction to Air pollution, R. K. Trivedy and P.K. Goel, B.S. Publications.
2. Air Pollution by Wark and Warner - Harper & Row, New York.
3. Environmental Science and Engineering by S.K.Dhameja

DISASTER MANAGEMENT			
Subject Code	18xxCEOxxxx	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 03

Course Objectives:

- Develop an understanding of why and how the modern disaster manager is involved with pre-disaster and post-disaster activities.
- Develop an awareness of the chronological phases of natural disaster response and refugee relief operations. Understand how the phases of each are parallel and how they differ.
- Understand the 'relief system' and the 'disaster victim.
- Describe the three planning strategies useful in mitigation.
- Identify the regulatory controls used in hazard management.
- Describe public awareness and economic incentive possibilities.

Unit -1 Natural Hazards And Disaster Management	
Introduction of DM – Inter Disciplinary -nature of the subject– Disaster Management cycle – Five priorities for action. Case study methods of the following: floods, draughts – Earthquakes – global warming, cyclones & Tsunamis – Post Tsunami hazards along the Indian coast – landslides.	**Hours – 10**
Unit -2 Man Made Disaster And Their Management Along With Case Study Methods Of The Following	
Fire hazards – transport hazard dynamics– solid waste management – post disaster – bio terrotirism -threat in mega cities, rail and air craft's accidents, and Emerging infectious diseases & Aids and their management.	**Hours – 10**
Unit – 3 Risk And Vulnerability	
Building codes and land use planning – social vulnerability – environmental vulnerability – Macroeconomic management and sustainable development, climate change risk rendition – financial management of disaster – related losses	**Hours – 10**
Unit – 4 Role Of Technology In Disaster Managements:	
Disaster management for infra structures, taxonomy of infra structure – treatment plants and process facilities-electrical substations- roads and bridges-mitigation programme for earth quakes –flowchart, geospatial information in agriculture drought assessment-multimedia technology in disaster risk management and training- transformable indigenous knowledge in disaster reduction.	**Hours – 10**
Unit-5 Education And Community Preparedness:	
Education in disaster risk reduction-Essentials of school disaster education-Community capacity and disaster resilience-Community based disaster recovery -Community based disaster management and social capital-Designing resilience- building community capacity for action.	**Hours – 10**

Course outcomes:

On completion of this course, students are able to

- Affirm the usefulness of integrating management principles in disaster mitigation work
- Distinguish between the different approaches needed to manage pre- during and post-disaster periods
- Explain the process of risk management
- Relate to risk transfer
- Prepare community for risk reduction

TEXT BOOKS

1. Disaster Management – Global Challenges and Local Solutions' by Rajib shah & R

Krishnamurthy (2009), Universities press.
2. Disaster Science & Management' by Tushar Bhattacharya, Tata McGraw Hill Education Pvt. Ltd., New Delhi.
3. Disaster Management – Future Challenges and Opportunities' by Jagbir Singh (2007), I K International Publishing House Pvt. Ltd.
4. http://ndma.gov.in/ (Home page of National Disaster Management Authority).

GREEN BUILDINGS AND SUSTAINABILITY			
Subject Code	18xxCEOxxxx	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits –03			

Course Objectives:

Enable the students to

- Know the green building and green energy building materials.
- Familiarize with different rating agencies and features of green buildings.
- Understand the term sustainability and sustainable development.
- Learn sources of greenhouse gases and its impact on climate.
- Understand and Plan land use confirming to zonal regulations

Unit -1	
INTRODUCTION What is Green Building, Why to go for Green Building, Benefits of Green Buildings, Green Building Materials and Equipment in India, What are key Requisites for Constructing a Green Building, Important Sustainable features for Green Building	**Hours – 10**
Unit -2	
GREEN BUILDING CONCEPTS AND PRACTICES Indian Green Building Council, Green Building Moment in India, Benefits Experienced in Green Buildings, Launch of Green Building Rating Systems, Residential Sector, Market Transformation; Green Building Opportunities And Benefits: Opportunities of Green Building, Green Building Features, Material and Resources, Water Efficiency, Optimum Energy Efficiency, Typical Energy Saving Approach in Buildings, LEED India Rating System and Energy Efficiency,	**Hours – 10**
Unit – 3	
SUSTAINABILITY Introduction, Human development index, Sustainable development and social ethics, definitions of sustainability, populations and consumptions	**Hours – 10**
Unit – 4	
THE CARBON CYCLE AND ENERGY BALANCES Introduction, Climate science history, carbon sources and emissions, The carbon cycle, carbon flow pathways, and repositories, Global energy balance, Global energy balance and temperature model, Greenhouse gases and Effects, Climate change projections and impacts	**Hours – 10**
Unit-5	
SUSTAINABILITY AND BUILT ENVIRONMENT Introduction, Land use and land cover change, Land use planning and its role in sustainable development-Zoning and land use planning, smart growth, Environmentally sensitive design- low impact development, green infrastructure and conservation design, Green buildings and land use planning, Energy use and buildings	**Hours – 10**

Course outcomes:

On completion of this course, students are able to:

- Describe green buildings and green building materials.

- Acquaint with different rating agencies and energy features of green buildings.
- Understand the term sustainability and sustainable development.
- Recognize sources of green house gases emissions and its impact on climate.
- Plan land use confirming to zonal regulations.

TEXT BOOKS

1. Standard for the Design of High-Performance Green Buildings by ASHRAE
2. Engineering Applications in Sustainable Design and Development By Bradley A.Striebig, Adebayo A.Ogundipe and Maria Papadakis. First edition, 2016, CENGAGE Learning.

REFERENCES

1. Handbook on Green Practices published by Indian Society of Heating Refrigerating and Air conditioning Engineers, 2009. 2.
2. Green Building Hand Book by Tomwoolley and Samkimings, 2009.
3. IGBC - Smart Cities & Green Building Concept in India

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EEE

COURSE STRUCTURE AND DETAILED SYLLABUS

SITE 18M REGULATIONS

For

B.Tech.

Electrical and Electronics Engineering

With effective from the Academic Year

2020-21

I -B. Tech I- Semester Approved Course structure Common for ME/CE/EEE

S. No	Subject Code		Subject title	L	T	P	C
1	18CMEGT1010	HSMC	Technical English	3	1		3
2	18CMMAT1020	BSC	Engineering Mathematics-I	3	1		4
3	18CMCHT1030	BSC	Engineering Chemistry	2			4
4	18CMEET1040	ESC	Basic Electrical Engineering	3	1		4
5	18CMEGL1050	HSMC	English Communication Skills Lab			2	1
6	18CMCHL1060	BSC	Engineering Chemistry Lab			3	1.5
7	18CMEEL1070	ESC	Basic Electrical Engineering Lab			3	1.5
8	18CMMSM1080	MC	Constitution of India, Professional Ethics &Human Rights(MC)	2			
			Total	**13**	**3**	**8**	**19**

I B. Tech II Semester Approved Course structure Common for ME/CE/EEE

S. No	Subject Code		Subject title	L	T	P	C
1	18CMMAT2010	BSC	Engineering Mathematics II	3	1		4
2	18EEPHT2020	BSC	Engineering Physics	3	1		4
3	18CMCST2030	ESC	Programming for Problem solving	3			3
4	18CMMEL2040	ESC	Engineering Graphics	1		4	3
5	18EEPHL2050	BSC	Engineering Physics Lab			3	1.5
6	18CMCSL2060	ESC	Programming for Problem Solving Lab			4	2
7	18CMMEL2070	ESC	Work Shop /Manufacturing practice			3	1.5
8	18CMCHN2080	MC	Environmental Science(MC)	2			
			Total	**12**	**2**	**14**	**19**

II-B. Tech EEEI-Semester Approved Course structure

S. No	Subject Code		Subject title	L	T	P	C
1	18CMMAT3010	BSC	Engineering Mathematics III	3	1		4
2	18EEEET3020	PCC	Analog Electronics	3			3
3	18EEEET3030	PCC	Electromagnetic fields	3	1		4
4	18EEEET3040	PCC	Electrical Circuit Analysis	3	1		4
5	18EEEET3050	PCC	Electrical Machines I	3			3
6	18EEEEL3060	PCC	Analog Electronics Lab			3	1.5
7	18EEEEL3070	PCC	Electrical Circuit Analysis Lab			3	1.5
8	18EEEEL3080	PCC	Electrical Machines I Lab			3	1.5
			Total	**15**	**3**	**9**	**22.5**

II B. Tech EEE II Semester Approved Course structure

S. No	Subject Code		Subject title	L	T	P	C
1	18EEEET4010	ESC	Signals & Systems	2	1		3
2	18CMMET4020	ESC	Engineering Mechanics	3	1		4
3	18EEEET4030	PCC	Digital Electronics	3			3
4	18EEEET4040	PCC	Control Systems	3			3
5	18EEEET4050	PCC	Electrical Machines II	3			3
6	18EEEEL4060	PCC	Digital Electronics Lab			3	1.5
7	18EEEEL4070	PCC	Control Systems Lab			3	1.5
8	18EEEEL4080	PCC	Electrical Machines II Lab			3	1.5
			Total	**14**	**2**	**9**	**20.5**

III -B. Tech EEEI-Semester Approved Course structure

S. No	Subject Code		Subject title	L	T	P	C
1	18EEEET5010	PCC	Microprocessors& Microcontrollers	3			3
2	18EEEET5020	PCC	Power Generation, Transmission & Distribution	3			3
3	18CMMST5030	HSMC	Management Science	3			3
4	18EEEET5040	PCC	Power Electronics	3			3
5	18EEEET5050	PCC	Electrical Measurements &Instrumentation	3			3
6	18EEXXO506X	OE	Open Elective – 1	3			3
7	18EEEEL5070	PCC	Power Systems Lab			3	1.5
8	18EEEEL5080	PCC	Power Electronics Lab			3	1.5
9	18CMAHS5090	SOC	Soft Skills& Aptitude Builder - 1	1		2	2
			Total	**19**		**8**	**23**

III B. Tech EEE II Semester Approved Course structure

S. No	Subject Code		Subject title	L	T	P	C
1	18EEEET6010	PCC	Power Systems Operation & Control	3			3
2	18CMMST6020	HSMC	Engineering Economics & Financial management	3			3
3	18EEEEP603X	PE	Program Elective–1	3			3
4	18EEXXO604X	OE	Open Elective – 2	3			3
5	18EEXXO605X	OE	Open Elective – 3	3			3
6	18EEEEL6060	PCC	Microprocessors & Microcontrollers Lab			2	1
7	18EEEEL6070	PCC	Measurements and Instrumentation Lab			3	1.5
8	18CMAHS6080	SOC	Soft Skills &Aptitude Builder – 2	1		2	2
9	18CMBIN6090	MC	Biology for Engineers	2			
	Total			**18**		**7**	**19.5**

Program Elective–1

18EEEEP603A	Line Commutated and Active Rectifiers
18EEEEP603B	HVDC Transmission Systems
18EEEEP603C	Control Systems Design

IV –B. Tech EEEI-Semester Approved Course structure

S. No	Subject Code		Subject title	L	T	P	C
1	18EEEET7010	PCC	Power System Protection	3			3
2	18EEEEP702X	PE	ProgramElective-2	3			3
3	18EEEEP703X	PE	ProgramElective-3	3			3
4	18EEEEP704X	PE	ProgramElective-4	3			3
5	18EEEEP705X	PE	ProgramElective-5	3			3
6	18EEXXO706X	OE	Open Elective – 4	3			3
7	18EEEEL7070	PCC	Power System Analysis Lab			3	1.5
8	18EEEES7080	SOC	Design of Photovoltaic Systems	1		2	2
9	18EEEEI7090	II	Industry Internship(During Summer vacation)				3
			Total	**19**		**5**	**24.5**

Program Elective–2

18EEEEP702A	Modeling and Control of DC Drives
18EEEEP702B	Smart Grid
18EEEEP702C	Optimization Techniques

Program Elective–3

18EEEEP703A	Electrical & Hybrid Vehicles
18EEEEP703B	Power System Dynamics &Stability
18EEEEP703C	Digital signal Processing

Program Elective– 4

18EEEEP704A	Modeling and Control of AC Drives
18EEEEP704B	Electrical Energy Conservation & Auditing
18EEEEP704C	Intelligent Control & Its Applications

Program Elective– 5

18EEEEP705A	Flexible Alternating Current Transmission Systems
18EEEEP705B	Power Quality
18EEEEP705C	Digital Control Systems

IV B. Tech EEE II Semester Approved Course structure

S. No	Subject Code	Subject title	L	T	P	C
1	18EEEER8010	Project			14	12
		Total			**14**	**12**

Open Electives offered by EEE department

S. No	Subject Code	Subject title
1	18XXEEOM0XA	Control system design
2	18XXEEOM0XB	Optimization techniques
3	18XXEEOM0XC	Electrical Energy Conservation And Auditing
4	18XXEEOM0XD	Electrical &Hybrid Vehicles
5	18XXEEOM0XE	Intelligent control & its applications
6	18XXEEOM0XF	Electrical materials
7	18XXEEOM0XG	Industrial Electrical Systems
8	18XXEEOM0XH	Modern Control Theory

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS SEMESTER - I			
Subject Code	18CMMSN1080	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit -1	
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours – 10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours – 10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**Hours – 10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes	**Hours –10**

APPROVED

Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility.Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours – 10**
COURSE OUTCOMES: On completion of the course student will 1. Have general knowledge and legal literacy and thereby to take up competitive examinations. 2. Understand state and central policies, fundamental duties. 3. Understand Electoral Process, special provisions. 4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and 5. Understand Engineering ethics and responsibilities of Engineers 6. Understand Engineering Integrity & Reliability	
QUESTION PAPER PATTERN: **SECTION A:** 1. This section contains ten one answer questions carrying 1 mark each. 2. Two questions from each unit should present. **SECTION B:** 1. This section will have 5 questions with internal choice. 2. Each full question carries 12 marks. 3. Each full question will have sub question covering all topics under a unit.	
TEXT BOOKS: **Text Books:** 1. Durga Das Basu: **"Introduction to the Constitution on India"**, (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn.,	

2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources

1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

Course outcomes to Program outcomes mapping:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Co urse	-	-	-	-	-	3	-	5	-		-	-	-	-	-

APPROVED

ENVIRONMENTAL SCIENCE SEMESTER - II			
Subject Code	18CMCHN2080	Internal Marks	30
Number of Lecture Hours/Week	04	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the different ecosystems	**Hours – 10**

Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**Hours – 12**
Unit – 3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**Hours – 6**
Unit – 4	

ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution	**Hours – 12**
d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	
Unit – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems - pond, river, hill slopes, etc.	**Hours – 10**

COURSE OUTCOMES:

On completion of the course student will be

1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Able to understand the concept of ecosystem and its diversity.
3. Able to gain knowledge on natural resources.
4. Able to understand the concept of biodiversity.
5. Able to gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Question Paper Pattern:

1. Question paper contains 10 Questions, 2 from each course outcome.
2. The student must answer 5 full questions by selecting one question from each course outcome (Internal Choice)
3. All questions carries 14 marks each
4. Each full question will have sub question covering all topics under a course outcome

TEXT BOOKS:

1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi
3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.

BIOLOGY FOR ENGINEERS SEMESTER - V			
Subject Code	18CMBIN5100	Internal Marks	30
Number of Lecture Hours/Week	3(L)	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

Course Objectives

1. Convey that Biology is as important as scientific discipline as Mathematics, Physics and Chemistry.
2. Convey that "Genetics is to biology what Newton's laws are to Physical Sciences".
3. Convey that without catalysis life would not have existed on earth.
4. Molecular basis of coding and decoding genetic information is universal.
5. Analyze biological processes at the reductionist level.

Unit -1	**Hours**
Introduction: Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of the 18th Century lead to major discoveries. Examples from Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor.	**10**
Unit -2	
Classification: Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra-structure- prokaryotes or eucaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotropes (d) Ammonia excretion – aminotelic, uricoteliec, ureotelic (e) Habitata- acquatic or terrestrial (e)	**10**

Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E.coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus.	
Unit – 3	
Genetics &Biomolecules: Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passesfrom parent to offspring. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins.	**10**
Unit – 4	
Enzymes & Proteins: Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins:** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements.	**10**
Unit – 5	
Microbiology & Metabolism: Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of Keq and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to CO_2 + H_2O (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). **Concept of single celled organisms:** Concept of species and strains. Identification and classification of	**10**

microorganisms. Microscopy. Ecological aspects of single celled organisms	

Course outcomes:

1. Understanding how biological observations of the 18th Century that lead to major discoveries.
2. Convey that classification per say is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
3. Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring.
4. Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine.
5. Convey that "Genetics is to biology what Newton's laws are to Physical Sciences".

Question paper pattern:

1. Question paper contains 10 Questions, 2 from each course outcome.
2. The student must answer 5 full questions by selecting one question from each course outcome (Internal Choice)
3. CO1- CO5 questions carries 14 marks each.
4. Each full question will have sub question covering all topics under a course outcome.

TEXT BOOKS

1. Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd.
2. Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons.

REFERENCE BOOKS

1. Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H.Freeman and Company
2. Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher.
3. Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm,C.Brown Publishers.

1-3-1
ME

COURSE STRUCTURE AND SYLLABUS

SITE-18M REGULATIONS

For

B.Tech.

Mechanical Engineering

With effective from the Academic Year

2022-23

sasi INSTITUTE OF TECHNOLOGY & ENGINEERING
autonomous
...Values We Live...
Accredited by NAAC with "A" Grade
Recognised by UGC under section 2(f) &12(B)
Approved by AICTE - NEW Delhi
Permanently Affiliated to JNTUK, SBTET
Ranked as "A" Grade by Govt. of A.P.
Department of Mechanical Engineering

B. Tech. (Mechanical Engineering)

Semester I (First Year) Approved Course structure

S.No.	Course Code		Course Title	L	T	P	C
1.	18CMEGT1010	HSMC	Technical English	3	0	0	3
2.	18CMMAT1020	BSC	Engineering Mathematics-I	3	1	0	4
3.	18CMCHT1030	BSC	Engineering Chemistry	3	1	0	4
4.	18CMEET1040	ESC	Basic Electrical Engineering	3	1	0	4
5.	18CMEGL1050	HSMC	English Communication skills lab	0	0	2	1
6.	18CMCHL1060	BSC	Engineering Chemistry Lab	0	0	3	1.5
7.	18CMEEL1070	ESC	Basic Electrical Engineering Lab	0	0	3	1.5
8.	18CMMSN1080	MC	Constitution of India, Professional Ethics & Human Rights	3	0	0	0
			Total	**11**	**03**	**07**	**19**

B.Tech. (Mechanical Engineering)

Semester II (First Year) Approved Course structure

S.NO.	Course Code		Course Title	L	T	P	C
1.	18CMMAT2010	BSC	Engineering Mathematics-II	3	1	0	4
2.	18MEPHT2020	BSC	Engineering Physics	3	1	0	4
3.	18CMCST2030	ESC	Programming for Problem Solving	3	0	0	3
4.	18CMMEL2040	ESC	Engineering Graphics	1	0	4	3
5.	18MEPHL2050	BSC	Engineering Physics Lab	0	0	3	1.5
6.	18CMCSL2060	ESC	Programming for Problem Solving lab	0	0	4	2
7.	18CMMEL2070	ESC	Work Shop/Manufacturing Practice	0	0	3	1.5
8.	18CMCHN2080	MC	Environmental Science	3	0	0	0
			Total	**11**	**02**	**15**	**19**

B.Tech. (Mechanical Engineering)

Semester III (Second Year) Approved Course structure

S.No.	Course Code		Course Title	L	T	P	C
1.	18CMMAT3010	BSC	Engineering Mathematics-III	3	1	0	4
2.	18MEMET3020	ESC	Engineering Mechanics	3	1	0	4
3.	18MEECT3030	ESC	Basic Electronics Engg.	3	0	0	3
4.	18MEMET3040	PCC	Manufacturing Processes	3	0	0	3
5.	18MEMET3050	PCC	Thermodynamics	3	0	0	3
6.	18MEMET3060	PCC	Materials Engineering	3	0	0	3
7.	18MEMEL3070	PCC	Manufacturing Processes Lab	0	0	3	1.5
8.	18MEMEL3080	PCC	CAEDP Lab	0	0	3	1.5
			Total	**15**	**2**	**06**	**23**

Semester IV (Second year) Approved Course structure

S.No.	Course Code		Course Title	L	T	P	C
1.	18MEMET4010	PCC	Strength of Materials	3	0	0	3
2.	18MEMET4020	PCC	Fluid Mechanics & Fluid Machines	3	0	0	3
3.	18MEMET4030	PCC	Theory of Machines-I	3	0	0	3
4.	18MEMET4040	PCC	Applied Thermodynamics	3	0	0	3
5.	18CMMST4050	HSMC	Engg. Economics & Financial Management	3	0	0	3
6.	18MEMEL4060	PCC	Fluid Mechanics & Fluid Machines Lab	0	0	3	1.5
7.	18MEMEL4070	PCC	Mechanics of Solids & Materials Lab	0	0	3	1.5
8.	18MEMEM4080	MC	Machine Drawing Lab	1	0	4	0
			Total	**14**	**00**	**06**	**18**

B.Tech. (Mechanical Engineering)

***Semester V (Third year)* Approved Course structure**

S.No.	Course Code		Course Title	L	T	P	C
1.	18MEMET5010	PCC	Machine Tools & Metrology	3	0	0	3
2.	18MEMET5020	PCC	Design of Machine Elements -I	3	0	0	3
3.	18MEMET5030	PCC	Heat Transfer	3	0	0	3
4.	18MEMET5040	PCC	CAD/CAM/CIM	3	0	0	3
5.	18MEMET505X	PEC	Professional Elective-1	3	0	0	3
6.	18MEXXO506X	OEC	Open Elective-I	3	0	0	3
7.	18MEMEL5070	PCC	Heat Transfer Lab	0	0	3	1.5
8.	18MEMEL5080	PCC	Machine Tools & Metrology Lab	0	0	3	1.5
9.	18MEXXS5090	SOC	Soft Skills & Aptitude Builder - 1	0	0	4	2
10.	18MEMEM50100	ESC	Biology for Engineers	3	0	0	0
			Total	**18**	**00**	**10**	**23**

Professional Elective Course -I

S.No.	Subject Code	Name of the subject	L	T	P	Cr
1.	18MEMEP505A	Conventional & Non-Conventional Power Stations	3	0	0	3*
2.	18MEMEP505B	Nano Technology	3	0	0	3*
3.	18MEMEP505C	Industrial Robotics with Artificial Intelligence	3	0	0	3*
NPTEL/SWAYAM/MOOCs (Course of 12 Weeks duration) to be offered						

B. Tech. (Mechanical Engineering)
Semester VI (Third year) Approved Course structure

S. No.	Course Code		Course Title	L	T	P	C
1.	18MEMET6010	PCC	Theory of Machines-II	3	0	0	3
2.	18MEMET6020	PCC	Design of Machine Elements -II	3	0	0	3
3.	18MEMEP603X	PE	Professional Elective -II	3	0	0	3
4.	18MEMEP604X	PE	Professional Elective -III	3	0	0	3
5.	18MEXXO605X	OE	Open Elective-II	3	0	0	3
6.	18MEMEL6060	PCC	Theory of Machines Lab	0	0	3	1.5
7.	18MEMEL6070	PCC	Thermal Engineering Lab	0	0	3	1.5
8.	18MEMEL6080	PCC	CAD/CAM Lab	0	0	3	1.5
9.	18MEXXS6090	SOC	Soft Skills & Aptitude Builder – 2	0	0	4	2
			Total	**17**	**00**	**14**	**21.5**

Professional Elective Course -II

S. No.	Subject Code	Name of the subject	L	T	P	Cr
1.	18MEMEP603A	Prime Movers for Automobiles	3	0	0	3*
2.	18MEMEP603B	Synthesis and Characterization of Materials	3	0	0	3*
3.	18MEMEP603C	Additive Manufacturing	3	0	0	3*
NPTEL/SWAYAM/MOOCs (Course of 12 Weeks duration) to be offered						

Professional Elective Course -III

S. No.	Subject Code	Name of the subject	L	T	P	Cr
1.	18MEMEP604A	Solar Energy Engineering and Applications	3	0	0	3*
2.	18MEMEP604B	Finite Element Methods	3	0	0	3*
3.	18MEMEP604C	Smart Manufacturing & IIOT	3	0	0	3*
NPTEL/SWAYAM/MOOCs (Course of 12 Weeks duration) to be offered						

B. Tech. (Mechanical Engineering)

***Semester VII (Fourth Year)* Approved Course structure**

S. No.	Course Code		Course Title	L	T	P	C
1.	18MEMET7010	HSMC	Operations Research	3	0	0	3
2.	18MEMET7020	PCC	Instrumentation and Mechatronics	3	0	0	3
3.	18MEMET703X	PE	Professional Elective -IV	3	0	0	3
4.	18MEMEP704X	PE	Professional Elective -V	3	0	0	3
5.	18MEXXO705X	OE	Open Elective- III	3	0	0	3
6.	18MEXXO706X	OE	Open Elective- IV	3	0	0	3
7.	18MEMEL7070	PCC	Instrumentation and Mechatronics Lab	0	0	3	1.5
8.	18MEMER7080	PCC	Internship with Seminar	0	0	6	3
9.	18MEMES7090	SOC	Skill Oriented Course – 3 (Hyper Mesh)	0	0	4	2
			Total	**18**	**0**	**14**	**24.5**

Professional Elective Course -IV

S.No.	Subject Code	Name of the subject	L	T	P	Cr
1.	18MEMEP703A	Refrigeration & Air Conditioning	3	0	0	3*
2.	18MEMEP703B	Mechanics of Composites	3	0	0	3*
3.	18MEMEP703C	Non – Destructive Evaluation	3	0	0	3*
NPTEL/SWAYAM/MOOCs (Course of 12 Weeks duration) to be offered						

Professional Elective Course -V

S.No.	Subject Code	Name of the subject	L	T	P	Cr
1.	18MEMEP704A	Gas Dynamics and Jet Propulsion	3	0	0	3*
2.	18MEMEP704B	Mechanical Vibrations	3	0	0	3*
3.	18MEMEP704C	Production Planning and Control	3	0	0	3*
NPTEL/SWAYAM/MOOCs (Course of 12 Weeks duration) to be offered						

Semester VIII (Fourth Year) Approved Course structure

S. No.	Course Code		Course Title	L	T	P	C
1.	18MEMER801X	PCC	Project Work, Seminar & Internship in industry	-	-	-	12
			Total	**-**	**-**	**-**	**12**

OPEN ELECTIVE COURSES

S.No.	Subject Code	Name of the subject	L	T	P	Cr
1.	18XXMEOX0XA	Operations Research	3	0	0	3
2.	18XXMEOX0XB	Fundamentals of Mechanical Engineering	3	0	0	3
3.	18XXMEOX0XC	Industrial Robotics	3	0	0	3
4.	18XXMEOX0XD	Engineering Materials	3	0	0	3
5.	18XXMEOX0XE	Introduction to Material Handling	3	0	0	3
6.	18XXMEOX0XF	Production Planning and Control	3	0	0	3
7.	18XXMEOX0XG	Non-Conventional Sources of Energy	3	0	0	3
8.	18XXMEOX0XH	Fluid Mechanics and Fluid Machinery	3	0	0	3

CREDIT DISTRIBUTION FOR B.TECH. ME PROGRAM

S.No.	Categories	ME											
		AICTE	Approved	Modified	Deviation	I-I	I-II	II-I	II-II	III-I	III-II	IV-I	IV-II
1	Humanities and Social Sciences	12	11	12	0	4			3		2	3	
2	Basic Science courses	25	26	23	-2	9.5	9.5	4					
3	Engineering Science courses	24	23	22	-2	5.5	9.5	7					
4	Professional Core courses	48	55	55	+7			12	15	12	11	5	
5	Professional Elective Courses	18	18	15	-3					3	6	6	
6	Open elective courses	18	12	12	-6					3	3	6	
7	Project work , Seminar and Internship	15	15	15	0							3	12
8	Skill Courses			06						2	2	2	
9	Mandatory Courses	-	-	-	-					-			
	Total Credits	**160**	**160**	**160**		**19**	**19**	**23**	**18**	**20**	**24**	**25**	**12**

B.Tech. (Mechanical Engineering)

Semester III (Second Year) Approved Course structure

Sl. No.	Course Code		Course Title	L	T	P	C
9.	18CMMAT3010	BSC	Engineering Mathematics-III	3	1	0	4
10.	18MEMET3020	ESC	Engineering Mechanics	3	1	0	4
11.	18MEECT3030	ESC	Basic Electronics Engg.	3	0	0	3
12.	18MEMET3040	PCC	Manufacturing Processes	3	0	0	3
13.	18MEMET3050	PCC	Thermodynamics	3	0	0	3
14.	18MEMET3060	PCC	Materials Engineering	3	0	0	3
15.	18MEMEL3070	PCC	Manufacturing Processes Lab	0	0	3	1.5
16.	18MEMEL3080	PCC	CAEDP Lab	0	0	3	1.5
			Total	**15**	**2**	**06**	**23**

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS SEMESTER - I			
Subject Code	18CMMSN1080	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit -1	
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours – 10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours – 10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**Hours – 10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes	**Hours –10**

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Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility.Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours – 10**
COURSE OUTCOMES: On completion of the course student will 1. Have general knowledge and legal literacy and thereby to take up competitive examinations. 2. Understand state and central policies, fundamental duties. 3. Understand Electoral Process, special provisions. 4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and 5. Understand Engineering ethics and responsibilities of Engineers 6. Understand Engineering Integrity & Reliability	
QUESTION PAPER PATTERN: **SECTION A:** 1. This section contains ten one answer questions carrying 1 mark each. 2. Two questions from each unit should present. **SECTION B:** 1. This section will have 5 questions with internal choice. 2. Each full question carries 12 marks. 3. Each full question will have sub question covering all topics under a unit.	
TEXT BOOKS: **Text Books:** 1. Durga Das Basu: **"Introduction to the Constitution on India"**, (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn.,	

2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:
1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources
1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

Course outcomes to Program outcomes mapping:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Co urse	-	-	-	-	-	3	-	5	-		-	-	-	-	-

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ENVIRONMENTAL SCIENCE SEMESTER - II			
Subject Code	18CMCHN2080	Internal Marks	30
Number of Lecture Hours/Week	04	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the different	**Hours – 10**

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ecosystems	
Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**Hours – 12**
Unit – 3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**Hours – 6**

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Unit – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	**Hours – 12**
Unit – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems - pond, river, hill slopes, etc.	**Hours – 10**
COURSE OUTCOMES:	

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On completion of the course student will be

1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Able to understand the concept of ecosystem and its diversity.
3. Able to gain knowledge on natural resources.
4. Able to understand the concept of biodiversity.
5. Able to gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

QUESTION PAPER PATTERN:

SECTION A:

1. This section contains ten one answer question carrying 1 mark each.
2. Two questions from each unit should present.

SECTION B:

1. This section will have 5 questions with internal choice.
2. Each full question carries 12 marks.
3. Each full question will have sub question covering all topics under a unit.

TEXT BOOKS:

1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi
3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.

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2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. Environmental Studies, P.N. Paliniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

Course Outcomes to Program Outcomes Mapping:

CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-
6	-	3		-	-	-	-	-	-	-	-	-	-	-	-
Course	3	3	3	-	-	-	3	-	-	-	-	-	-	-	-

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BIOLOGY FOR ENGINEERS SEMESTER - VI			
Subject Code	18CMBIT6010	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course Objectives:

This course will enable students to:

- convey that Biology is as important as scientific discipline as Mathematics, Physics and Chemistry
- convey that classification per se is not what biology is all about. The underlying criterion, such as morphological, biochemical or ecological be highlighted.
- convey that "Genetics is to biology what Newton's laws are to Physical Sciences"
- convey that all forms of life has the same building blocks and yet the manifestations are as diverse as one can imagine
- convey that without catalysis life would not have existed on earth
- molecular basis of coding and decoding genetic information is universal
- analyses biological processes at the reductionist level
- fundamental principles of energy transactions are the same in physical and biological world.

Unit -1 Introduction	**Hours**
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor.	**8**
Unit -2 Classification	
Hierarchy of life forms at phenomenological level- classification based on (a) cellularity- Unicellular or multicellular (b) ultra structure- prokaryotes or eucaryotes. (c) energy and Carbon utilization - Autotrophs, heterotrophy, lithotropes (d) Ammonia excretion – aminotelic, uricoteliec, ureoteli (e) Habitata - acquatic or terrestrial (f) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E.coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**8**
Unit – 3 Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:**Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	**12**
Unit – 4 Enzymes & Proteins	

Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. - examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of genetic code. Define gene in terms of complementation and recombination	**12**
Unit – 5 Microbiology & Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms**. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	**10**

Course outcomes:

On completion of this course, students are able to

1. Describe how biological observations of 18th Century that lead to major discoveries.
2. Convey that classification per se is not what biology is all about but highlight theunderlying criteria, such as morphological, biochemical and ecological
3. Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
4. Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
5. Classify enzymes and distinguish between different mechanisms of enzyme action.
6. convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Question paper pattern:

Section A:

1. This section contains ten one or two line answer question carrying 1 mark each.
2. Two questions from each unit should present.

Section B:

1. This Section will have 10 questions, 2 from each unit
2. Each full question carry 12 marks.
3. Each full question will have sub question covering all topics under a unit.
4. The student will have to answer 5 full questions selecting one full question from each unit

Text Books:

1. Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd

2. Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
3. Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers

References:

1. Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
2. Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher

Course Outcomes to Program Outcomes mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	-	-	-	3	2	-	-	-	-	-	-	-	-
2	-	-	-	-	-	2	3	-	-	-	-	-	-	-	-
3	1	-	-	-	-	3	-	-	-	-	-	-	-	-	-
4	3	-	-	-	-	-	2	-	-	-	-	-	-	-	-
5	2	-	-	-	-	3	-	-	-	-	-	-	-	-	-
6	3	-	-	-	-	3	3	-	-	-	-	-	-	-	-
Course	**1**	**-**	**-**	**-**	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Course Structure

SITE18M Regulations

For

B.Tech.

in

Electronics and Communication Engineering

With effective from the academic year 2020-21

sasi INSTITUTE OF TECHNOLOGY & ENGINEERING
autonomous
Accredited by **NAAC** with **"A"** Grade
Recognised by **UGC** under section 2(f) &12(B)
Approved by **AICTE** - NEW Delhi
Permanently Affiliated to **JNTUK, SBTET**
Ranked as **"A" Grade** by Govt. of A.P.
Department of Electronics & Communication Engineering

Course Structure for SITE18M Regulations

B. Tech (Electronics and Communication Engineering)

Semester I (First year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18CMMAT1010	Engineering Mathematics – 1	3	1	0	4
2	18ECPHT1020	Engineering Physics	3	1	0	4
3	18CMCST1030	Programming for Problem Solving	3	0	0	3
4	18CMMEL1040	Engineering Graphics	1	0	4	3
5	18ECPHL1050	Engineering Physics Lab	0	0	3	1.5
6	18CMCSL1060	Programming for Problem Solving Lab	0	0	4	2
7	18CMMEL1070	Workshop/Manufacturing practice	0	0	3	1.5
8	18CMCHN1080	Environmental Science	3	0	0	0
Total						**19**

Semester II (First year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18CMEGT2010	Technical English	3	0	0	3
2	18CMMAT2020	Engineering Mathematics - II	3	1	0	4
3	18CMCHT2030	Engineering Chemistry	3	1	0	4
4	18CMEET2040	Basic Electrical Engineering	3	1	0	4
5	18CMEGL2050	English Communication Skills Lab	0	0	2	1
6	18CMCHL2060	Engineering Chemistry Lab	0	0	3	1.5
7	18CMEEL2070	Basic Electrical Engineering Lab	0	0	3	1.5
8	18CMMSN2080	Constitution of India, PE&HR	3	0	0	0
Total						**19**

Course Structure for

B. Tech (Electronics and Communication Engineering)

Semester III (Second year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18CMMAT3010	Engineering Mathematics – III	3	1	0	4
2	18ECECT3020	Electronic Devices	3	0	0	3
3	18ECECT3030	Network Analysis	3	0	0	3
4	18ECECT3040	Signals & Systems	3	0	0	3
5	18ECECT3050	Probability & Stochastic Processes	3	0	0	3
6	18ECECL3060	Electronic Devices Lab	0	0	3	1.5
7	18ECECL3070	Network Analysis Lab	0	0	3	1.5
8	18ECECN3080	Pulse & Digital Circuits	3	0	0	0
Total						**19**

Semester IV (Second year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18ECECT4010	Digital System Design	3	0	0	3
2	18CMMET4020	Engineering Mechanics	3	1	0	4
3	18ECECT4030	EM Waves & Transmission Lines	3	0	0	3
4	18ECECT4040	Analog Circuits	3	0	0	3
5	18ECECT4050	Analog & Digital Communications	3	0	0	3
6	18ECECL4060	Digital System Design Lab	0	0	3	1.5
7	18ECECL4070	Analog Circuits Lab	0	0	3	1.5
8	18ECECL4080	Analog & Digital Communications Lab	0	0	3	1.5
Total						**20.5**

Course Structure for

B. Tech (Electronics and Communication Engineering)

Semester V (Third year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18CMMST5010	Management Science	3	0	0	3
2	18ECECT5020	Control Systems	3	1	0	4
3	18ECECT5030	Computer Architecture & Organization	3	0	0	3
4	18ECECT5040	Microprocessor and Microcontrollers	3	0	0	3
5	18ECECT5050	Digital Signal Processing	3	0	0	3
6	18ECECP506X	Professional Elective - I	3	0	0	3
7	18ECECL5070	Microprocessor and Microcontrollers Lab	0	0	3	1.5
8	18ECECL5080	Digital Signal Processing Lab	0	0	3	1.5
9	18CMAHS5090	Soft Skills & Aptitude Builder-I (Skill Oriented Course-I)	1	0	2	2
10	18CMMSN50A0	Biology for Engineers	2	0	0	0
Total						**24**

Professional Elective-I

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18ECECP506A	Antennas and Wave Propagation	3	0	0	3
2	18ECECP506B	Information Theory & Coding	3	0	0	3
3	18ECECP506C	System Design through Verilog	3	0	0	3

Course Structure for

B. Tech (Electronics and Communication Engineering)

Semester VI (Third year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18ECECT6010	VLSI Design	3	0	0	3
2	18ECECT6020	Computer Networks	3	0	0	3
3	18ECECP603X	Professional Elective – II	3	0	0	3
4	18ECECP604X	Professional Elective – III	3	0	0	3
5	18ECXXO605X	Open Elective – I	3	0	0	3
6	18ECXXO606X	Open Elective - II	3	0	0	3
7	18ECECL6070	VLSI Design Lab	0	0	4	2
8	18ECECL6080	Computer Networks Lab	0	0	3	1.5
9	18CMAHS6090	Soft Skills and Aptitude Builder-2 (Skill Oriented Course-II)	1	0	2	2
Total						**23.5**

Professional Elective-II

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18ECECP603A	Embedded System Design	3	0	0	3
2	18ECECP603B	Design for Testability	3	0	0	3
3	18ECECP603C	Advanced Digital Signal Processing	3	0	0	3

Professional Elective-III

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18ECECP604A	Microwave Engineering	3	0	0	3
2	18ECECP604B	Internet Protocols	3	0	0	3
3	18ECECP604C	Digital Image Processing	3	0	0	3

OE-I & OE-II
Candidate should select the subject from list of subjects offered by other departments

Course Structure for

B. Tech (Electronics and Communication Engineering)

Semester VII (Fourth year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18CMMST7010	Engineering Economics & Financial Management	3	0	0	3
2	18ECECT7020	Electronic Measurements & Instrumentation	3	0	0	3
3	18ECECP703X	Professional Elective – IV	3	0	0	3
4	18ECECP704X	Professional Elective – V	3	0	0	3
5	18ECXXO705X	Open Elective – III	3	0	0	3
6	18ECXXO706X	Open Elective - IV	3	0	0	3
7	18ECECS7070	IOT and its Applications / Microwave Circuits and Antenna Design using HFSS (Skill Oriented Course-III)	1	0	2	2
8	18ECECR7080	Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester	0	0	6	3
Total						**23**

Professional Elective-IV

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18ECECP703A	Embedded and Real Time Concepts	3	0	0	3
2	18ECECP703B	Low Power VLSI	3	0	0	3
3	18ECECP703C	Cellular and Mobile Communications	3	0	0	3

Professional Elective-V

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18ECECP704A	Radar Systems	3	0	0	3
2	18ECECP704B	Wireless Sensor Networks.	3	0	0	3
3	18ECECP704C	Computer vision and Image Processing	3	0	0	3

OE-III & OE-IV

Candidate should select the subject from list of subjects offered by other departments

Course Structure for

B. Tech (Electronics and Communication Engineering)

Semester VIII (Fourth year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18ECECR8010	Project: Project work, seminar and internship in industry	0	0	24	12
Total						**12**

Open Elective Courses offered by ECE Department to the other Departments

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	18XXECOX0XA	VLSI Design	3	0	0	3
2	18XXECOX0XB	HDL Programming for IC Design	3	0	0	3
3	18XXECOX0XC	Principles of Communication Systems	3	0	0	3
4	18XXECOX0XD	Transducers and Sensors	3	0	0	3
5	18XXECOX0XE	Fundamentals of Microprocessors and Microcontrollers	3	0	0	3
6	18XXECOX0XF	Fundaments of Internet of Things	3	0	0	3
7	18XXECOX0XG	Fundamentals of Digital Image Processing	3	0	0	3
8	18XXECOX0XH	Signals and Systems	3	0	0	3

Head of the Department

Head of the Department
Electronics & Communication Engineering
Sasi Institute of Technology & Engineering
Tadepalligudem-534 101. W.G.Dist., A.P.

ENVIRONMENTAL SCIENCE SEMESTER - I			
Subject Code	18CMCHN1080	IA Marks	30
Number of Lecture Hours/Week	04	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -1	**Hours**
MULTIDISCIPLINARYNATUREOF ENVIRONMENTALSTUDIES **Environment**-Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. -Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the different ecosystems	**10**
Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems –Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**12**
Unit -3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographically classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega- diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**6**
Unit -4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of: a. Air pollution f. Water pollution b. Soil pollution g. Marine pollution c. Noise pollution	**12**

d. Thermal pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	
Unit -5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. - Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. - Study of simple ecosystems - pond, river, hill slopes, etc.	**10**
COURSE OUTCOMES: On completion of the course student will be 1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges. 2. Able to understand the concept of eco system and its diversity. 3. Able to gain knowledge on natural resources. 4. Able to understand the concept of biodiversity. 5. Able to gain knowledge on environmental pollution. 6. Gain knowledge on environmental legislation and global treaties.	
Question paper pattern: 1. Question paper consists of 10 questions. 2. Each full question carrying 14 marks. 3. Each full question will have sub question covering all topics under a unit. 4. The student will have to answer 5 full questions selecting one full question from each unit.	
TEXT BOOKS: 1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi. 2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi 3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall ofIndia, New Delhi	
REFERENCE BOOKS: 1. Text Book of Environmental Studies by Deeshita Dave&P. Udaya Bhaskar, Cengage Learning. 2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada. 3. Environmental Studies, P.N. Paliniswamy, P. Manikandan,A. Geeta and K. Manjula Rani, Pearson Education, Chennai.	

Course Outcomes to Program Outcomes Mapping:

CO	PO1	PO2	PO 3	PO4	PO5	PO6	PO7	PO 8	PO9	PO 10	PO11	PO12	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-
6	-	3		-	-	-	-	-	-	-	-	-	-	-	-
Course	3	3	3	-	-	-	3	-	-	-	-	-	-	-	-

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS Common to all branches SEMESTER-II			
Subject Code	18CMMSN2080	IA Marks	30
Number of Lecture Hours/Week	3+1(T)	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

- To provide basic information about Indian constitution.
- To identify individual role and ethical responsibility towards society.
- To understand human rights and its implications.

Unit -1	**Hours**
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th&91st Amendments.	**10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchayats and Co - Operative Societies.	**10**
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies.
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity &Reliability

Question paper pattern:

1. Question paper consists of 10 questions.
2. Each full question carrying 14 marks.
3. Each full question will have sub question covering all topics under a unit.
4. The student will have to answer 5 full questions selecting one full question from each unit.

Text Books:

1. Durga Das Basu: "Introduction to the Constitution on India", (Students Edn.) Prentice –Hall EEE, 19th / 20thEdn.,2001

2. Charles E. Haries, Michael S Pritchard and Michael J.Robins"Engineering Ethics" Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing,2002.
2. M. Govindarajan, S. Natarajan, V.S.Senthilkumar, "Engineering Ethics", Prentice – Hall of India Pvt. Ltd. New Delhi,2004
3. Brij Kishore Sharma," Introduction to the Constitution of India", PHI Learning Pvt. Ltd., New Delhi,2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources

1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

COURSE OUTCOMESTOPROGRAMOUTCOMES MAPPING:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Course	-	-	-	-	-	3	-	5	-		-	-	-	-	-

Management Science SEMESTER V			
Subject Code	18CMMST5010	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	48	Exam Hours	03
Pre-requisite		Credits - 03	

Course objectives:

This course will enable the students to

- Understand the concepts of Management its nature & importance, Management theories and organization principles.
- Analyse the Work study, SQC, inventory management and its techniques.
- Learn various concepts like PERT, CPM and Project crashing and recent trends in management.

Unit -I	**Hours**
Introduction to Management: Concept –nature and importance of Management – Functions of Management – Evaluation of Management thought- Theories of Motivation – Decision making process-Designing organization structure- Principles of organization - Types of organization structure.	**8**
Unit –II	
Operations Management: Principles and Types of Layouts – Work study- Statistical Quality Control- Control charts (P-chart, R-chart, and C chart). Simple problems- Material Management: Need for Inventory control- EOQ, ABC analysis (simple problems) and Types of ABC analysis (HML, SDE, VED, and FSN analysis).	**10**
Unit-III	
Functional Management & Strategic Management: **Functional Management**: Concept of HRM, HRD and PMIR- Functions of HRM - Marketing Management- Functions of Marketing, Marketing strategies based on product Life Cycle, Channels of distributions. **Strategic Management**: Vision, Mission, Goals, Strategy – Elements of Corporate Planning Process – Environmental Scanning – SWOT analysis- Steps in Strategy Formulation and Implementation, Generic Strategy alternatives	**10**
Unit –IV	
Project Management: **(PERT/CPM):** Development of Network – Difference between PERT and CPM Identifying Critical Path- Probability- Project Crashing (Simple Problems).	**10**
Unit-V	
Contemporary Management Practices: Basic concepts of MIS, MRP, Justin- Time (JIT) system, Total Quality Management (TQM), Six sigma , Supply Chain Management, Enterprise Resource Planning (ERP), Business Process outsourcing (BPO), Business process Re-engineering and Bench Marking, Balanced Score Card.	**10**

Course outcomes:

On completion of the course student will be able to:

1. Execute the functions of Management, Principles of Management &Leadership

styles.

2. Examine Statistical Quality Control Techniques, Methods of inspection, the concept of Inventory Management and Control
3. Predict the Customer Behavior and Employees Contribution towards success of Organization.
4. Identify different Strategies for the Development of the Organization.
5. Analyze Project Management Techniques like CPM, PERT and Crashing.
6. Apply various contemporary issues in Management Practices like TQM, Business Process Reengineering and BPO etc.

Text Books:

1. Dr. A. R. Aryasri – Management Science, TMH 2011.
2. Dr. P.G.Ramanujam, Dr. B.V.R.Naidu and Prof.P.V.Rama Sastry: Management Science, Himalaya Publishing House 2013.

Reference Books:

1. Koontz & Weihrich: 'Essentials of Management' TMH 2011.
2. Seth & Rastogi: Global Management Systems, Cengage Learning, Delhi, 2011.
3. Robbins: Organizational Behaviors, Pearson Publications, 2011

Web References:

1. https://www.managementstudyguide.com/management_principles.htm
2. https://businessjargons.com/strategic-management.html

Soft Skills & Aptitude builder - 1 SEMESTER - V			
Subject Code	21CMAHS5080	**IA Marks**	**15**
Number of Lecture Hours/Week	**2**	**Exam Marks**	**35**
Total Number of Lecture Hours	**32**	**Exam Hours**	**3**
Credits - 2			

Unit – 1A: Intrapersonal Communication	**Hours**
Introduction to Soft Skills and its significance **Personal Effectiveness**: Who am I and What am I: My strengths and weaknesses, SWOT analysis; SMART Goal Setting, Being Proactive **Principles of Personal Vision**: Beginning with the end in mind Time management: Understanding priorities: put first-things-first **Activity**: Psychometric tests and SWOT analysis, SMART goal setting	**6**
Unit 2A: Interpersonal Communication	
Principles of Creative Cooperation and Organisation Skills: Think win-win; Seek first to understand then to be understood; Synergize; Life-long learning **Emotional Intelligence**: Self-awareness, self-regulation, Empathy, Assertiveness, Adoptability, Managing emotions **Activity**: Resolving a conflict with your friend, colleague, or a family member; Group discussions & Debates	**5**
Unit – 3A: 21st Century Skills	
What are 21st century skills? Learning skills- Digital literacy- Life skills **Critical Thinking**: Active listening, Observation, Introspection, Analytical thinking, Open mindedness **Problem Solving**: Understanding the complexity of the problem, defining the problem, cause and effect analysis, exploring possible solutions, planning actions, analysing results of your actions, getting feedback, redefining the problem, The problem solving cycle **Decision Making**: Managing conflict, conflict resolution, methods of decision making, effective decision making in teams – methods & styles **Activity**: Case study	**5**

Section-A: Text (T) / Reference (R) Books:	
T1	**English and Soft Skills, Dr. S. P. Dhanvel, Orient Blackswan, 2011**
R1	**Seven Habits of Highly Effective People, Stephen R Covey**
R2	**Emotional Intelligence, Daniel Goleman, Bantom Book, 2006**
R3	**21st Century Skills: Learning for Life in our Times, Bernie Trilling, Charles Fadel; John Wiley & Sons**

Course Outcomes: On completion of this course, students can	
Section A: Soft Skills	
CO 1	**re-engineer attitude and understand its influence on behaviour**
CO 2	**develop interpersonal skills and be an effective goal oriented team player**
CO 3	**develop holistic personality with a mature outlook to function effectively in different circumstances**

Course Outcomes to Programs Outcomes Mapping: (1: Low, 2: Medium, 3: High)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	-	-	-	-	-	-		1	-	3	-	-	-
2	-	-	-	-	-	-	-	-	2	1	-	3	-	-	-
3	-	-	-	-	-	-	-	-	1	1	-	3	-	-	-
4	-	-	-	-	-	-	-	-	-		-	-	-	-	-
5	-	-	-	-	-	-	-	-	-		-	-	-	-	-
Course	-	-	-	-	-	-	-	-	-		-	-	-	-	-

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Unit -1: Introduction	**Hours**
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	**08**
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**08**
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	**12**
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	**12**

genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms.** Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

Soft Skills & Aptitude Builder - 2			
Subject Code	18CMAHS6090	IA Marks	15
Number of Practice Hours/Week	4	Exam Marks	35
Total Number of Practice Hours	64	Exam Hours	3
Credits - 2			
Section A **Soft Skills**			
Unit – 1: Communicative Competence			**Hours**
Verbal Reasoning: Selecting Words, Spotting Errors, Ordering of Words, Sentence Formation, Paragraph Formation, Ordering of Sentences, Reading Comprehension, Completing Statements, Verbal Analogies, Cause and Effect, Syllogism, Logical Sequence of Words, Verbal Reasoning, Analysing Arguments, Verification of Truth, Matching Definitions, Theme Detection E-Mail Etiquette, Reporting News Activity: Completing Textual Exercises			**16**
Unit 2: Career and Employability Skills			
What is a Career: Career vs Job, Career Values & Grid, Skills vs Strengths, Spotting Skills/Reflection of Present Skills, Meeting the Expectation of your Employer, Matching your Skills with the Required Skills, Preparing Resume, Preparing for Interviews &Structuring Answers Activity: Resume Building, Interviews, Presentations, Digital Resumes			**16**
Section B **Aptitude Builder**			
Unit – 3: Time and Work			
Pipes and Cisterns: Problems on Unitary method, Relation between Men, Days, Hours and Work, Problems on Man-Day-Hours Method, Problems on Alternate Days, Problems on Pipes and Cisterns. **Time , Distance and Speed, Problems on Trains, Boats and Streams:** Relation between Speed, Distance and Time, Converting km/h into m/s and vice versa , Problems on Average Speed, Problems on Relative Speed, Problems on Circular Tracks, Problems on Races **Problems on Trains:** Two Trains Moving in Opposite Direction, Two Trains Moving in same Direction, A Train Crossing a Stationary Object of a Given Length like a Platform or Bridge, A Train Crossing a Stationary Object like a Pole or a Man **Boats and Streams:** Time Based, which can be considered as a Point Object Speed Based, Distance Based, Average Speed Based			**11**
Unit – 4: Logical and Analytical Reasoning			
Seating Arrangement: Linear Arrangement, Circular Arrangement, Tabler, Triangular Arrangement, Complex Arrangement. **Clocks :** Finding the Angle When the Time is Given, Finding the Time When the Angle is Known, Relation between Angles, Minutes and Hours, Position of Hands of the Clock, Time Gained or Lost by the Clock, Mirror /Water Image-based Time. **Calendars :** Definition of a Leap Year, Finding the Number of Odd Days, Framing the Year Code for Centuries, Finding the Day of any Random Calendar Date **Syllogisms:** Finding the Conclusions using Venn Diagram Method, Finding the Conclusions using Syllogism Method **Simple Interest:** Definitions, Problems on Interest and Amount, Problems when Rate of Interest and Time Period are Numerically Equal **Compound Interest:** Definition and Formula for Amount in Compound			**11**

Interest, Difference between Simple Interest and Compound Interest for 2 Years on the Same Principle and Time Period.		
Unit – 5: Permutations, Probability, Areas and Volumes		
Definition of permutation , Problems on Permutations , Definition of Combinations , problems on Combinations **Probability:** Definition of Probability, Problems on Coins, Problems on Dice, Problems on Deck of Cards , Problems on Years **Mensuration - 2D:**Formulas for Areas, Formulas for Volumes of Different Solids, Problems on Areas **Mensuration - 3D:** Problems on Volumes, Problems on Surface Areas		**10**
Text (T) / Reference (R) Books:		
For Units 1 & 2		
T1	R.S. Agarwal, Verbal & Non-Verbal Reasoning, S. Chand & Co., Latest ed. 2003	
T2	Soft Skills: Enhancing Employability: Connecting Campus with Corporate by MS Rao, IK International Publishing House	
R2	How to Prepare for Verbal Ability and Reading Comprehension, Arun Sharma, Meenakshi Upadhay, Mc Graw Hill	
For Units 3, 4, & 5		
T1	R S Agarwal, S Chand, 'Quantitative Aptitude'	
T2	R S Agarwal, S.Chand , 'A modern approach to Logical reasoning'	
R1	Quantitative Aptitude for CAT By Arun sharma	
R2	GL Barrons, Mc Graw Hills, Thorpe's verbal reasoning, LSAT Materials	
Course Outcomes: On completion of this course, students can		
Section A: Soft Skills		
CO1	learn and practice effective communication skills	
CO 2	develop broad career plans, evaluate the employment market, and become industry ready	
Section B: Aptitude Builder		
CO 3	develop accuracy on time and distance and units related solutions	
CO 4	solve the real-time problems for performing job functions easily	
CO 5	solve problems related to permutations and combinations, probability, areas and volumes	

Course Outcomes to Programs Outcomes Mapping: (1: Low, 2: Medium, 3: High)

CO	PO 1	PO2	PO 3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO 3
1	-	-	-	-	-	-	-	-	-	3	-	1	-	-	-
2	-	-	-	-	-	-	-	-	-	2	-	3	-	-	-
3	2	2	-	1	-	-	-	-	-	-	-	1	-	-	-
4	1	1	-	2	-	-	-	-	-	-	-	1	-	-	-
5	2	2	-	1	-	-	-	-	-	-	-	1	-	-	-
Course	2	2	-	1	-	-	-	-	-	2	-	2	-	-	-

ENGINEERING ECONOMICS & FINANCIAL MANAGEMENT SEMESTER VII			
Subject Code	18CMMST7010	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	48	Exam Hours	03
Pre-requisite	Management Science	Credits – 03	

Course Objectives:

This course will enable students to

1. Understand the basic concepts of Managerial economics, demand, demand forecasting techniques
2. Apply the techniques of production and able to analyze the cost concepts
3. Understand various market structures & pricing policies and analyze various formats of business-like sole trader, partnership, joint stock
4. apply the concepts of financial accounting to estimate the profit or loss of a firm
5. apply different techniques of capital budgeting to take investment decisions.

Unit -1	**Hours**
Introduction to Managerial Economics and demand Analysis: Definition of Managerial Economics and Scope-Managerial Economics and its relation with other subjects-Concept of Demand- Types-Determents-Law of Demand its Exception-Elasticity of Demand-Types and Measurement- Demand forecasting and its Methods.	8
Unit -2	
Production and Cost Analysis: Production function-Iso-quants and Iso-cost- Law of Variable proportions- Cobb-Douglas Production Function-Economics of Sale-Cost Concepts- Opportunity Cost- Fixed vs Variable Costs-Explicit Costs vs Implicit Costs-Cost Volume Profit analysis- Determination of Break-Even Point (Simple Problems).	10
Unit -3	
Introduction To Markets, Pricing Policies & forms Organizations and Business Cycles: Market Structures: Perfect Competition, Monopoly and Monopolistic and Oligopoly – Features Price Output Determination – Methods of Pricing: Market Skimming Pricing, And Internet Pricing: Flat Rate Pricing. **Introduction to forms of business:** Features and Evaluation of Sole Trader – Partnership – Joint Stock Company State/Public Enterprises and their forms – Business Cycles – Meaning and Features – Phases of Business Cycle	10
Unit – 4	
Introduction to Accounting & Financing Analysis: Introduction to Double Entry Systems – Preparation of Financial Statements- Analysis and Interpretation of Financial Statements-Ratio Analysis (Simple Problems)	10
Unit – 5	
Capital and Capital Budgeting: Capital Budgeting: Meaning of Capital-Capitalization-Meaning of Capital Budgeting-Need for Capital Budgeting-Techniques of Capital Budgeting-Traditional and Modern Methods.	10
Total	**48**

Course outcomes:

On completion of the course student will be able to

1. Define the basic concepts of managerial economics, demand, and demand forecasting techniques
2. Apply the techniques of production and able to analyze the cost concepts
3. Identify various market structures & pricing policies and Identify various formats of business-like sole trader, partnership, joint stock etc.,
4. Apply the concepts of financial accounting to estimate profit or loss of a firm CO5
5. Apply the different techniques of capital budgeting to take investment decisions

Text Books:

1. Dr. A. R. Aryasri, Managerial Economics and Financial Analysis, TMH, 2011.
2. B. Kuberudu and T. V. Ramana, Managerial Economics & Financial Analysis, Himalaya Publishing House,2011.

Reference Books:

1. P. Vijaya Kumar and N.Apparao, Management Science, Cengage, Delhi,2012.
2. S. A. Siddiqui &A. S. Siddiqui: Managerial Economics and Financial Analysis, New Age International Publishers,2012
3. Vanitha Agarwal, Managerial Economics, Pearson Publications2011.

COURSE STRUCTURE

SITE18M

REGULATIONS

For

Computer Science and Engineering

With effective from the Academic Year 2020-21

B. Tech I Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18CMMAT1010	Engineering Mathematics-I	3	1		4
02	18CSPHT1020	Engineering Physics	3	1		4
03	18CMCST1030	Programming for ProblemSolving	3			3
04	18CMMEL1040	Engineering Graphics	1		4	3
05	18CSPHL1050	Engineering Physics Lab			3	1.5
06	18CMCSL1060	Programming for Problem Solving Lab			4	2
07	18CMMEL1070	Workshop/ManufacturingPractice	0		3	1.5
08	18CMCHN1080	Environmental Science	3			0
Total			**13**	**2**	**14**	**19**

I B. Tech II Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18CMEGT2010	Technical English	3			3
02	18CMMAT2020	Engineering Mathematics-II	3	1		4
03	18CMCHT2030	Engineering Chemistry	3	1		4
04	18CMEET2040	Basic Electrical Engineering	3	1		4
05	18CMEGL2050	English Communication Skills Lab			2	1
06	18CMCHL2060	Engineering Chemistry Lab			3	1.5
07	18CMEEL2070	Basic Electrical Engineering Lab			3	1.5
08	18CMMSN2080	Indian Constitution, Professional Ethics & Human Rights	3			0
Total			**15**	**3**	**8**	**19**

II B. Tech I Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18CMMAT3010	Engineering Mathematics- III	3	1		4
02	18CSECT3020	Digital Electronics	3			3
03	18CSECT3030	Analog Electronic Circuits	3			3
04	18CSCST3040	Discrete Mathematics	3	1		4
05	18CSCST3050	Data Structures	3			3
06	18CSECL3060	Analog & Digital Electronics Lab			3	1.5
07	18CSCSL3070	IT Workshop Lab			3	1.5
08	18CSCSL3080	Data Structures Lab			3	1.5
Total			**15**	**2**	**9**	**21.5**

II B. Tech II Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18CSECT4010	Signals & Systems	3			3
02	18CMCET4020	Engineering Mechanics	3			3
03	18CSCST4030	Computer Organization	3			3
04	18CSCST4040	Algorithm Design and Analysis	3			3
05	18CSCST4050	Java Programming	3			3
06	18CSCSL4060	Computer Organization Lab			3	1.5
07	18CSCSL4070	Algorithm Design and AnalysisLab			3	1.5
08	18CSCSL4080	Java Programming Lab			3	1.5
Total			**15**	**0**	**9**	**19.5**

III B. Tech I Semester

S. No.	Subject			Hours			
	Code	Type	Title	L	T	P	C
01	18CMMST5010	HS	Management Science	3			3
02	18CSCST5020	PC	Database Management Systems	3			3
03	18CSCST5030	PC	Operating Systems	3			3
04	18CSCSP504X	PE	Professional Elective-I	3			3
05	18CSXX505X	OE	Open Elective-I	3			3
06	18CSCSL5060	PC	Database Management Systems Lab			3	1.5
07	18CSCSL5070	PC	Operating Systems Lab			3	1.5
08	18CMAHS5080	SOC	Soft Skills & Aptitude Builder - 1	2			2
09	18CMBIN5090	MC	Biology for Engineers	2			0
Total Credits							**20**

III B. Tech II Semester

S. No.	Subject			Hours			
	Code	Type	Title	L	T	P	C
01	18CSCST6010	HS	Engineering Economics & Financial Management	3			3
02	18CSCST6020	PC	Computer Networks	3			3
03	18CSCST6030	PC	Software Engineering	3			3
04	18CSCSP604X	PE	Professional Elective-II	3			3
05	18CSXXO605X	OE	Open Elective-II	3			3
06	18CMMST6060	PC	Automata theory and Compiler Design	3			3
07	18CSCSL6070	PC	Computer Networks Lab			3	1.5
08	18CSCSL6080	PC	Compiler Design Lab			3	1.5
09	18CMAHS6090	SOC	Soft Skills & Aptitude Builder - 2	2			2
Total Credits							**23**

IV B. Tech I Semester

IV B. Tech I Semester

S. No.	Subject			Hours			
	Code	Type	Title	L	T	P	C
01	18CSCST7010	PC	Data Warehousing and Data Mining	3			3
02	18CSCSP702X	PE	Professional Elective-III	3			3
03	18CSCSP703X	PE	Professional Elective-IV	3			3
04	18CSCSP704X	PE	Professional Elective-V	3			3
05	18CSXXO705X	OE	Open Elective-III	3			3
06	18CSXXO706X	OE	Open Elective-IV	3			3
07	18CSCSL7070	PC	Internet of Things Lab			3	1.5
08	18CSCSL7080	PC	Data Warehousing and Data Mining Lab			3	1.5
09	18CSCSL7090	SOC	MEAN Stack Technologies			4	2
10	18CSCSR7100		Internship				3
Total Credits							**26**

IV B. Tech II Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18CSCSR8010	Project Phase -II			24	12
		Total			**24**	**12**

ENVIRONMENTAL SCIENCE SEMESTER - II			
Subject Code	18CMCHN2080	Internal Marks	30
Number of Lecture Hours/Week	04	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the different ecosystems	**Hours – 10**

Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**Hours – 12**
Unit – 3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**Hours – 6**
Unit – 4	

ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution	Hours – 12
d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	
Unit – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems - pond, river, hill slopes, etc.	Hours – 10

COURSE OUTCOMES:

On completion of the course student will be

1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Able to understand the concept of ecosystem and its diversity.
3. Able to gain knowledge on natural resources.
4. Able to understand the concept of biodiversity.
5. Able to gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Question Paper Pattern:

1. Question paper contains 10 Questions, 2 from each course outcome.
2. The student must answer 5 full questions by selecting one question from each course outcome (Internal Choice)
3. All questions carries 14 marks each
4. Each full question will have sub question covering all topics under a course outcome

TEXT BOOKS:

1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi
3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS SEMESTER - I			
Subject Code	18CMMSN1080	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit -1	
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours – 10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours – 10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**Hours – 10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation	**Hours –**

Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	**10**
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours – 10**
COURSE OUTCOMES: On completion of the course student will 1. Have general knowledge and legal literacy and thereby to take up competitive examinations. 2. Understand state and central policies, fundamental duties. 3. Understand Electoral Process, special provisions. 4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and 5. Understand Engineering ethics and responsibilities of Engineers 6. Understand Engineering Integrity & Reliability	
Question Paper Pattern: 1. Question paper contains 10 Questions, 2 from each course outcome. 2. The student must answer 5 full questions by selecting one question from each course outcome (Internal Choice) 3. All questions carries 14 marks each 4. Each full question will have sub question covering all topics under a course outcome	
Text Books: 1. Durga Das Basu: **"Introduction to the Constitution on India"**, (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn., 2001 2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.	
Reference Books: 1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.	

2. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics"**, Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma," **Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 03

Unit -1: Introduction	**Hours**
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	08
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	08
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	12
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	12

genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms.** Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

1.3.1
IT

SITE 18M

COURSE STRUCTURE AND DETAILED SYLLABUS

for

Bachelor of Technology
in
Information Technology

With effective from the

Academic Year 2020-21

sasi INSTITUTE OF TECHNOLOGY & ENGINEERING
autonomous
Accredited by NAAC with "A" Grade
Recognised by UGC under section 2(f) &12(B)
Approved by AICTE - NEW Delhi
Permanently Affiliated to JNTUK, SBTET
Ranked as "A" Grade by Govt. of A.P.
Department of Information Technology

Regulation SITE 18M

I B. Tech I Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18CMMAT1010	Engineering Mathematics-I	3	1		4
02	18ITPHT1020	Engineering Physics	3	1		4
03	18CMCST1030	Programming for Problem Solving	3			3
04	18CMMEL1040	Engineering Graphics	1		4	3
05	18ITPHL1050	Engineering Physics Lab			3	1.5
06	18CMCSL1060	Programming for Problem SolvingLab			4	2
07	18CMMEL1070	Workshop / Manufacturing Practice	0		3	1.5
08	18CMCHN1080	Environmental Science	3			0
Total			13	2	14	19

I B. Tech II Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18CMEGT2010	Technical English	3			3
02	18CMMAT2020	Engineering Mathematics-II	3	1		4
03	18CMCHT2030	Engineering Chemistry	3	1		4
04	18CMEET2040	Basic Electrical Engineering	3	1		4
05	18CMEGL2050	English Communication Skills Lab			2	1
06	18CMCHL2060	Engineering Chemistry Lab			3	1.5
07	18CMEEL2070	Basic Electrical Engineering Lab			3	1.5
08	18CMMSN2080	Indian Constitution, Professional Ethics & Human Rights	3			0
Total			15	3	8	19

II B. Tech I Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18CMMAT3010	Engineering Mathematics- III	3	1		4
02	18ITECT3020	Digital Electronics	3			3
03	18ITECT3030	Analog Electronic Circuits	3			3
04	18ITITT3040	Discrete Mathematics	3	1		4
05	18ITITT3050	Data Structures	3			3
06	18ITECL3060	Analog & Digital Electronics Lab			3	1.5
07	18ITITL3070	IT Workshop Lab			3	1.5
08	18ITITL3080	Data Structures Lab			3	1.5
Total			**15**	**2**	**9**	**21.5**

II B. Tech II Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18ITECT4010	Signals & Systems	3			3
02	18CMCET4020	Engineering Mechanics	3			3
03	18ITITT4030	Computer Organization	3			3
04	18ITITT4040	Algorithm Design and Analysis	3			3
05	18ITITT4050	Java Programming	3			3
06	18ITITL4060	Computer Organization Lab			3	1.5
07	18ITITL4070	Algorithm Design and Analysis Lab			3	1.5
08	18ITITL4080	Java Programming Lab			3	1.5
Total			**15**	**0**	**9**	**19.5**

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Department of Information Technology

III B. Tech I Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18CMMST5010	Management Science	3			3
02	18ITITT5020	Data Base Management Systems	3			3
03	18ITITT5030	Operating Systems	3			3
04	18ITITP504X	Professional Elective-I	3			3
05	18ITXXO505X	Open Elective-I	3			3
06	18ITITL5060	Data Base Management Systems Lab			3	1.5
07	18ITITL5070	Operating Systems Lab			3	1.5
08	18CMAHS5080	Soft Skills & Aptitude Builder - 1	2			2
09	18CMBIN5090	Biology for Engineers	2			0
		Total	19	0	6	20

III B. Tech II Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18CMMST6010	Engineering Economics & Financial Management	3			3
02	18ITITT6020	Data Warehousing and Data Mining	3			3
03	18ITITT6030	Computer Networks	3			3
04	18ITITT6040	Software Engineering	3			3
05	18ITITP605X	Professional Elective-II	3			3
06	18ITXXO606X	Open Elective-II	3			3
07	18ITITL6070	Software Engineering Lab			3	1.5
08	18ITITL6080	Data Mining using Python Lab			3	1.5
09	18CMAHS6090	Soft Skills & Aptitude Builder - 2	2			2
		Total	20		6	23

IV B. Tech I Semester

w	Code	Title	Hours			Credits
			L	T	P	
01	18ITITT7010	Machine Learning	3			3
02	18ITITP702X	Professional Elective-III	3			3
03	18ITITP703X	Professional Elective-IV	3			3
04	18ITITP704X	Professional Elective-V	3			3
05	18ITXXO705X	Open Elective-III	3			3
06	18ITXXO706X	Open Elective-IV	3			3
07	18ITITL7070	Machine Learning Lab			3	1.5
08	18ITITL7080	Object Oriented Analysis and Design Lab			3	1.5
09	18ITITS7090	MEAN Stack Technologies			4	2
10	18ITITR7100	Internship				3
		Total	**18**		**10**	**26**

IV B. Tech II Semester

S. No.	Code	Title	Hours			Credits
			L	T	P	
01	18ITITR8010	Project Phase -II			24	12
		Total			**24**	**12**

Program Elective-I	
18ITITP504A	UI Design
18ITITP504B	Artificial Intelligence
Program Elective-II	
18ITITP605A	R Programming
18ITITP605B	Software Quality Assurance
Program Elective-III	
18ITITP702A	Distributed Databases
18ITITP702B	Big Data Analytics
Program Elective-IV	
18ITITP703A	Software Project Management
18ITITP703B	Software Testing Methodologies
Program Elective-V	
18ITITP704A	Cryptography & Network Security
18ITITP704B	Cloud Computing

Open Elective Courses offered by IT

S.No.	Subject Code	Name of the subject	L	T	P	Cr
1.	18XXITOXXXX	Internet of Things	3	0	0	3
2.	18XXITOXXXX	Block Chain	3	0	0	3
3.	18XXITOXXXX	Quantum Computing	3	0	0	3
4.	18XXITOXXXX	Virtual Reality	3	0	0	3
5.	18XXITOXXXX	Data Structures through C	3	0	0	3
6.	18XXITOXXXX	Designing Database Management Systems	3	0	0	3
7.	18XXITOXXXX	Operating Systems Concepts	3	0	0	3
8.	18XXITOXXXX	R Programming	3	0	0	3
9.	18XXITOXXXX	Python Programming	3	0	0	3
10.	18XXITOXXXX	Java Programming	3	0	0	3
11.	18XXITOXXXX	App Technologies	3	0	0	3
12.	18XXITOXXXX	Web Technologies	3	0	0	3
13.	18XXITOXXXX	Artificial Intelligence	3	0	0	3

Head of the Department

Head of the Department
Department of Information Technology
Sasi Institute of Technology & Engineering
TADEPALLIGUDEM, W.G.Dt., A.P.

ENVIRONMENTAL SCIENCE SEMESTER - II			
Subject Code	18CMCHN2080	Internal Marks	30
Number of Lecture Hours/Week	04	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the different	**Hours – 10**

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ecosystems	
Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**Hours – 12**
Unit – 3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**Hours – 6**

APPROVED

Unit – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	**Hours – 12**
Unit – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems - pond, river, hill slopes, etc.	**Hours – 10**
COURSE OUTCOMES:	

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On completion of the course student will be

1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Able to understand the concept of ecosystem and its diversity.
3. Able to gain knowledge on natural resources.
4. Able to understand the concept of biodiversity.
5. Able to gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

QUESTION PAPER PATTERN:

SECTION A:

1. This section contains ten one answer question carrying 1 mark each.
2. Two questions from each unit should present.

SECTION B:

1. This section will have 5 questions with internal choice.
2. Each full question carries 12 marks.
3. Each full question will have sub question covering all topics under a unit.

TEXT BOOKS:

1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi
3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.

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2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. Environmental Studies, P.N. Paliniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

Course Outcomes to Program Outcomes Mapping:

CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-
6	-	3		-	-	-	-	-	-	-	-	-	-	-	-
Course	3	3	3	-	-	-	3	-	-	-	-	-	-	-	-

APPROVED

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS

Common to all

Subject Code	18CMMSN1080	IA Marks	30
Number of Lecture Hours/Week	3+1(T)	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 00

COURSE OBJECTIVES:

The objectives of this course help the students to

- To provide basic information about Indian constitution.
- To identify individual role and ethical responsibility towards society.
- To understand human rights and its implications.

Unit -1	
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours– 10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours– 10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th&91stAmendments.	**Hours– 10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchayats and Co - Operative Societies.	**Hours–10**
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours– 10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity &Reliability

Question paper pattern:

1. Question paper consists of 10 questions.
2. Each full question carrying 14 marks.
3. Each full question will have sub question covering all topics under a unit.
4. The student will have to answer 5 full questions selecting one full question from each unit.

Text Books:

1. Durga Das Basu: **"Introduction to the Constitution on India"**, (Students Edn.) Prentice –Hall EEE, 19th / 20thEdn.,2001
2. Charles E. Haries, Michael S Pritchard and Michael J.Robins**"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing,2002.
2. M. Govindarajan, S. Natarajan, V.S.Senthilkumar, **"Engineering Ethics"**, Prentice –Hall of India Pvt. Ltd. New Delhi,2004
3. Brij Kishore Sharma," **Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi,2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources

1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

COURSE OUTCOMESTOPROGRAMOUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Course	-	-	-	-	-	3	-	5	-		-	-	-	-	-

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Unit -1: Introduction	Hours
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	08
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	08
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	12
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	12

genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms.** Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

REGULATIONS,
COURSE STRUCTURE AND SYLLABUS
AND
SYLLABUS

(Aligned with AICTE Model Curriculum)

Aligned with AICTE model Curriculum 2018-2019

SITE18(M) REGULATIONS

for

B.Tech.

Computer Science & Technology

With Effective from the academic year

2020-2021

I B. Tech I Semester Course structure for the Academic Year 2020-2021

Common for ME/CE/EEE/CST

S.No.	Subject Code	Subject title	L	T	P	C
1	18CMEGT1010	Technical English	3	0	0	3
2	18CMMAT1020	Engineering Mathematics-I	3	1	0	4
3	18CMCHT1030	Engineering Chemistry	3	1	0	4
4	18CMEET1040	Basic Electrical Engineering	3	1	0	4
5	18CMEGL1050,	English Communication skills lab	0	0	2	1
6	18CMCHL1060	Engineering Chemistry Lab	0	0	3	1.5
7	18CMEEL1070	Basic Electrical Engineering Lab	0	0	3	1.5
		Total Credits				**19**
Constitution of India, professional ethics & human rights (Non -Credit course)						

I B. Tech II Semester Course structure for the Academic Year 2020-2021

Common for ME/CE/EEE/CST

S.No.	Subject Code	Subject title	L	T	P	C
1	18CMMAT2010	Engineering Mathematics II	3	1	0	4
2	18CTPHT2020	Engineering Physics	3	1	0	4
3	18CMCTT2030	Programming for problem solving	3	0	0	3
4	18CMMEL2040	Engineering Graphics	1	0	4	3
5	18CTPHL2050	English Physics lab	0	0	3	1.5
6	18CMCTL2060	Programming for problem solving lab	0	0	4	2
7	18CMMEL2070	Work Shop/Manufacturing Practice	0	0	3	1.5
			Total Credits			**19**
Environmental Science (Non -Credit course)						

II B. Tech I Semester

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18CMMAT3010	BS	Engineering Mathematics-III	3	1		4
02	18CTECT3020	ES	Digital Electronics	3			3
03	18CTECT3030	ES	Analog Electronic Circuits	3			3
04	18CTCTT3040	PC	Discrete Mathematics	3	1		4
05	18CTCTT3050	PC	Data Structures	3			3
06	18CTECL3060	ES	Analog & Digital Electronics Lab			3	1.5
07	18CTCTL3070	PC	IT Workshop Lab			3	1.5
08	18CTCTL3080	PC	Data Structures Lab			3	1.5
					Total Credits		**21.5**

II B. Tech II Semester

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18CTECT4010	ES	Signals & Systems	3			3
02	18CMCET4020	ES	Engineering Mechanics	3			3
03	18CTCTT4030	PC	Computer Organization	3			3
04	18CTCTT4040	PC	Algorithm Design and Analysis	3			3
05	18CTCTT4050	PC	Java Programming	3			3
06	18CTCTL4060	PC	Computer Organization Lab			3	1.5
07	18CTCTL4070	PC	Algorithm Design and Analysis Lab			3	1.5
08	18CTCTL4080	PC	Java Programming Lab			3	1.5
					Total Credits		**19.5**

III B. Tech I Semester

S. No.	Subject			Hours			
	Code	Type	Title	L	T	P	C
01	18CMMST5010	HS	Management Science	3			3
02	18CTCTT5020	PC	Database Management Systems	3			3
03	18CTCTT5030	PC	Operating Systems	3			3
04	18CTCTT504X	PE	Professional Elective-I	3			3
05	18CTXXT505X	OE	Open Elective-I	3			3
06	18CTCTL5060	PC	Database Management Systems Lab			3	1.5
07	18CTCTL5070	PC	Operating Systems Lab			3	1.5
08	18CTCTL5090	SOC	Soft Skills & Aptitude Builder – 1			4	2
09	18CMBIN5100	MC	Biology for Engineers	2			0
				Total Credits			**20**

III B. Tech II Semester

S. No.	Subject			Hours			
	Code	Type	Title	L	T	P	C
01	18CTCTT6010	PC	Data Warehousing and Data Mining	3			3
02	18CTCTT6020	PC	Computer Networks	3			3
03	18CTCTT6030	PC	Software Engineering	3			3
04	18CTCTT604X	PE	Professional Elective-II	3			3
05	18CTXXT605X	OE	Open Elective-II	3			3
06	18CMMST6060	HS	Engineering Economics & Financial Management	3			3
07	18CTCTL6070	PC	Computer Networks Lab			3	1.5
08	18CTCTL6080	PC	Data Warehousing and Data Mining Lab			3	1.5
09	18CMMAT6090	SOC	Soft Skills & Aptitude Builder – 2			4	2
				Total Credits			**23**

IV B. Tech I Semester

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18CTCTT7010	PC	Data Analytics	3			3
02	18CTCTT702X	PE	Professional Elective-III	3			3
03	18CTCTT703X	PE	Professional Elective-IV	3			3
04	18CTCTT704X	PE	Professional Elective-V	3			3
05	18CTXXT705X	OE	Open Elective-III	3			3
06	18CTXXT706X	OE	Open Elective-IV	3			3
07	18CTCTL7070	PC	Internet of Things Lab			3	1.5
08	18CTCTL7080	PC	Data Analytics Lab			3	1.5
09	18CTCTL7090	SOC	MEAN Stack Technologies			4	2
10	18CTCTR7100		Internship				3
						Total Credits	**26**

IV B. Tech II Semester

S. No.	Subject			Hours			C
	Code	Type	Title	L	T	P	
01	18CTCTR8010	PROJ	Project			12	12
						Total Credits	12

REGULATIONS, COURSE STRUCTURE AND SYLLABUS

Aligned with AICTE model Curriculem 2018-2019

SITE 2018(M) REGULATION

for

B.Tech.

Electronics and Communication Technology

With Effective from the academic year

2020-2021

...Values We Live...
sasi autonomous INSTITUTE OF TECHNOLOGY & ENGINEERING

Accredited by NAAC with "A" Grade
Recognised by UGC under section 2(f) &12(B)
Approved by AICTE - New Delhi
Permanently Affiliated to JNTUK, SBTET
Ranked as "A" Grade by Govt. of A.P.

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Department of Electronics & Communication Technology

Course structure for SITE18M Regulations
B.Tech. (Electronics & Communication Technology)

Semester I (First year)

S. No.	Subject Code	Subject title	L	T	P	C
1	18CMEGT1010	Technical English	3	0	0	3
2	18CMMAT1020	Engineering Mathematics-I	3	1	0	4
3	18CMCHT1030	Engineering Chemistry	3	1	0	4
4	18CMEET1040	Basic Electrical Engineering	3	1	0	4
5	18CMEGL1050	English Communication skills lab	0	0	2	1
6	18CMCHL1060	Engineering Chemistry Lab	0	0	3	1.5
7	18CMEEL1070	Basic Electrical Engineering Lab	0	0	3	1.5
8	18CMEEL1080	Constitution of India, professional ethics & human rights (Non - Credit course)	3	0	0	--
					Total Credits	19

Semester II (First year)

S. No.	Subject Code	Subject title	L	T	P	C
1	18CMMAT2010	EngineeringMathematics II	3	1	0	4
2	18EEPHT2020, 18MEPHT2020, 18CEPHT2020	Engineering Physics	3	1	0	4
3	18CMCST2030	Programming forproblem solving	3	0	0	3
4	18CMMEL2040	Engineering Graphics	1	0	4	3
5	18EEPHL2050, 18MEPHL2050, 18CEPHL2050	Engineering Physics Lab	0	0	3	1.5
6	18CMCSL2060	Programming for problem solving lab	0	0	4	2
7	18CMMEL2070	Work Shop/ Manufacturing practice	0	0	3	1.5

8	18CMMEL2080	Environmental Science (Non - Credit course)	3	0	0	---
					Total Credits	19

Semester III (Second year)

S.No	Course Code	Course Title	L	T	P	C
1	18CMMAT3010	Engineering Mathematics-III	3	1	0	4
2	18ETETT3020	Electronic Devices	3	0	0	3
3	18ETETT3030	Network Theory	3	0	0	3
4	18ETETT3040	Signals & Systems	3	0	0	3
5	18ETETT3050	Probability & Stochastic Processes	3	0	0	3
6	18ETETL3060	Electronic Devices Lab	0	0	3	1.5
7	18ETETL3070	Network Theory Lab	0	0	3	1.5
8	18ETETN3080	Pulse & Digital Circuits (MC)	3	0	0	0
		Total Credits				19

Semester IV (Second year)

S.No	Course Code	Course Title	L	T	P	C
1	18ETETT4010	Digital System Design	3	0	0	3
2	18CMMET4020	Engineering Mechanics	3	1	0	4
3	18ETETT4030	Electro Magnetic Waves &Transmission Lines	3	0	0	3
4	18ETETT4040	Analog Circuits	3	0	0	3
5	18ETETT4050	Analog & Digital Communications	3	0	0	3
6	18ETETL4060	Digital System Design Lab	0	0	3	1.5
7	18ETETL4070	Analog Circuits Lab	0	0	3	1.5
8	18ETETL4080	Analog & Digital Communications Lab	0	0	3	1.5
		Total Credits				20.5

Semester V (Third year)

S.No	Course Code	Course Title	L	T	P	C
1	18ETETT5010	Management science	3	0	0	3
2	18ETETT5020	Control Systems	3	0	0	3
3	18CMMST5030	Telecommunications and Switching Networks	3	0	0	3
4	18ETETT5040	Microprocessors and Micro Controllers	3	0	0	3
5	18ETETT5050	Digital Signal Processing	3	0	0	3
6	18ETETP5060	Professional Elective – 1*	3	0	0	3
7	18ETETL5070	Microprocessors and Micro Controllers Lab	0	0	3	1.5
8	18ETETL5080	Digital Signal Processing Lab	0	0	3	1.5
9	18CMAHS5090	Skill Oriented Course – I (Soft skills& Aptitude Builder -1)	1	0	2	2
10	18ETETN50A0	Biology for Engineers	3	0	0	0
		Total Credits				23

Semester VI (Third year)

S.No	Course Code	Course Title	L	T	P	C
1	18ETETT6010	Engineering Economics and Financial Management	3	0	0	3
2	18ETETT6020	VLSI Design	3	0	0	3
3	18CMMST6030	Computer Networks	3	0	0	3
4	18ETETP6040	Professional Elective – II*	3	0	0	3
5	18ETXXO605X	Open Elective – I**	3	0	0	3
6	18ETXXO606X	Open Elective – II**	3	0	0	3
7	18ETETL6070	Computer Networks Lab	0	0	3	1.5
8	18ETETL6080	VLSI Design Lab	0	0	3	1.5
9	18CMAHS6090	Skill Oriented Course – II (Soft skills & Aptitude Builder -2)	1	0	2	2
		Total Credits				**23**

Semester VII (Fourth year)

S.No	Course Code	Course Title	L	T	P	C
1	18ETETT7010	RF System Design	3	0	0	3
2	18ETETP7020	Professional Elective – III*	3	0	0	3
3	18ETETP7030	Professional Elective – IV*	3	0	0	3
4	18ETETP7040	Professional Elective – V*	3	0	0	3
5	18ETXXO705X	Open Elective – III**	3	0	0	3
6	18ETXXO706X	Open Elective – IV**	3	0	0	3
7	18ETETL7070	RF System Design Lab	0	0	3	1.5
8	18ETETI7080	Research Internship	0	0	3	3
9	18ETETS7090	Skill Oriented Course – III (Image Processing With Open CV)**OR** (Electromagnetic Simulation Tools (HFSS, CST & FEKO))	1	0	2	2
10	18ETETN70A0	Electronics Measurements & Instrumentation	3	0	0	0
					Total Credits	24.5

Semester VIII (Fourth year)

S.No	Course Code	Course Title	L	T	P	C
1	18ETETPR8010	Project Work, Seminar & Internship in Industry	0	0	0	12
		Total Credits				12
INTERNSHIP (6 MONTHS)						

Program Elective Courses:

Program Elective-1	18ETETP506A	Radiation Systems
	18ETETP506B	Digital Design Through Verilog
	18ETETP506C	IoT Fundamentals
	18ETETP506D	Spread Spectrum Techniques
Program Elective-2	18ETETP604A	Micro Wave and Optical Communications
	18ETETP604B	Design of Fault Tolerant Systems
	18ETETP604C	Embedded System Design
	18ETETP604D	Digital Image and Video Processing
Program Elective-3	18ETETP702A	Radar and Satellite Communications
	18ETETP702B	Low Power VLSI Design

	18ETETP702C	System On Chip Architectures
	18ETETP702D	Bio-Medical Signal Processing
Program Elective-4	18ETETP703A	Software Defined Radio
	18ETETP703B	CPLD and FPGA Architectures & Applications
	18ETETP703C	Wireless Technologies for IOT
	18ETETP703D	Artificial Neural Networks
Program Elective-5	18ETETP704A	Global Positioning Systems
	18ETETP704B	CAD Tools for VLSI
	18ETETP704C	Big Data Analytics for IoT
	18ETETP704D	Fuzzy Logic Systems

Elective Related Laboratories:

Elective Related Lab	18ECECL706A	Microwave & Optical Communication Lab
	18ECECL706B	VLSI Design Lab
	18ECECL706C	Embedded Systems Lab

Open Elective Courses offered by ECE to other Departments:

Open Electives	18ETETOXXXX	Signals and Systems
	18ETETOXXXX	Principles of Signal Processing
	18ETETOXXXX	Consumer Electronics
	18ETETOXXXX	Transducers and Sensors
	18ETETOXXXX	IOT and Applications
	18ETETOXXXX	IC Applications
	18ETETOXXXX	Principles of Communication Systems
	18ETETOXXXX	Data Communications
	18ETETOXXXX	Digital Logic design
	18ETETOXXXX	Remote Sensing and GIS

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS Common to all branches SEMESTER-II			
Subject Code	18CMMSN2080	IA Marks	30
Number of Lecture Hours/Week	3+1(T)	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

- To provide basic information about Indian constitution.
- To identify individual role and ethical responsibility towards society.
- To understand human rights and its implications.

Unit -1	**Hours**
Lesson: Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**10**
Unit -2	
Lesson: Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**10**
Unit – 3	
Lesson: State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th&91st Amendments.	**10**
Unit – 4	
Lesson: Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchayats and Co - Operative Societies.	**10**
Unit – 5	
Lesson: Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies.
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity &Reliability

Question paper pattern:

1. Question paper consists of 10 questions.
2. Each full question carrying 14 marks.
3. Each full question will have sub question covering all topics under a unit.
4. The student will have to answer 5 full questions selecting one full question from each unit.

Text Books:

1. Durga Das Basu: "Introduction to the Constitution on India", (Students Edn.) Prentice –Hall EEE, 19th / 20thEdn.,2001

2. Charles E. Haries, Michael S Pritchard and Michael J.Robins"Engineering Ethics" Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing,2002.
2. M. Govindarajan, S. Natarajan, V.S.Senthilkumar, "Engineering Ethics", Prentice – Hall of India Pvt. Ltd. New Delhi,2004
3. Brij Kishore Sharma," Introduction to the Constitution of India", PHI Learning Pvt. Ltd., New Delhi,2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

Website Resources

1. www.nptel.ac.in
2. www.hnlu.ac.in
3. www.nspe.org
4. www.preservearticles.com

COURSE OUTCOMESTOPROGRAMOUTCOMES MAPPING:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-		-	-	-	-	-	-	-
4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
5						3									
6	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
Course	-	-	-	-	-	3	-	5	-		-	-	-	-	-

ENVIRONMENTAL SCIENCE			
Subject Code	18CMCHN2080	IA Marks	30
Number of Lecture Hours/Week	04	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
2. Understand the concept of ecosystem and its diversity.
3. Gain knowledge on natural resources.
4. Understand the concept of biodiversity.
5. Gain knowledge on environmental pollution.
6. Gain knowledge on environmental legislation and global treaties.

Unit -1	
MULTIDISCIPLINARYNATUREOF ENVIRONMENTALSTUDIES **Environment**-Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Carbon credits - Sustainability, Stockholm & Rio Summit - Population growth & explosion - Role of Information Technology in Environment and human health. **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. -Food chains, food webs and ecological pyramids. Introduction, types, characteristic features,structure and function of the different ecosystems	**Hours– 10**
Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems –Forest resources – Use and over – exploitation, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	**Hours– 12**
Unit -3	
BIODIVERSITY AND ITS CONSERVATION Introduction - Definition: genetic, species and ecosystem diversity. – Biogeographically classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels. India as a mega- diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**Hours– 6**
Unit -4	
ENVIRONMENTAL POLLUTION	**Hours– 12**

Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution. - Pollution case studies.	
Unit -5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act - Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness. **Field work:** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. - Study of simple ecosystems - pond, river, hill slopes, etc.	**Hours– 10**
COURSE OUTCOMES: On completion of the course student will be 1. Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges. 2. Able to understand the concept of eco system and its diversity. 3. Able to gain knowledge on natural resources. 4. Able to understand the concept of biodiversity. 5. Able to gain knowledge on environmental pollution. 6. Gain knowledge on environmental legislation and global treaties.	
Question paper pattern: 1. Question paper consists of 10 questions. 2. Each full question carrying 14 marks. 3. Each full question will have sub question covering all topics under a unit. 4. The student will have to answer 5 full questions selecting one full question from each unit.	
TEXT BOOKS: 1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi. 2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi 3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall ofIndia, New Delhi	
REFERENCE BOOKS: 1. Text Book of Environmental Studies by Deeshita Dave&P. UdayaBhaskar, Cengage Learning. 2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada. 3. Environmental Studies, P.N. Paliniswamy, P. Manikandan,A. Geeta and K. Manjula Rani, Pearson Education, Chennai.	

Course Outcomes to Program Outcomes Mapping:

CO	PO1	PO2	PO 3	PO4	PO5	PO6	PO7	PO 8	PO9	PO 10	PO11	PO12	PSO 1	PSO 2	PSO 3
1	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-
6	-	3		-	-	-	-	-	-	-	-	-	-	-	-
Course	3	3	3	-	-	-	3	-	-	-	-	-	-	-	-

MANAGEMENT SCIENCE SEMESTER V			
Subject Code	18CMMST5010	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	48	Exam Hours	03
Pre-requisite	---	Credits – 03	

Course Objectives:

This course will enable students to

1. To define the Basic Concepts of Management and organization
2. To summarize the different layouts for production, statistical quality control, methods of inspection importance of inventory management in operations
3. To identify the consumer behavior and Human Resource contribution in the development of organizations.
4. To apply the techniques of project management PERT, CPM to complete the project within optimal time and cost.
5. To identify various strategies used for organizational development

Unit -1	**Hours**
Introduction to Management: Concept –nature and importance of Management – Functions of Management – Evaluation of Management thought- Theories of Motivation – Decision making process-Designing organization structure- Principles of organization - Types of organization structure.	8
Unit -2	
Operations Management: Principles and Types of Layouts – Work study- Statistical Quality Control- Control charts (P-chart, R-chart, and C chart). Simple problems- Material Management: Need for Inventory control- EOQ, ABC analysis (simple problems) and Types of ABC analysis (HML, SDE, VED, and FSN analysis).	10
Unit -3	
Functional Management HRM& Marketing: Concept of HRM, HRD and PMIR- Functions of HRM - Marketing Management- Functions of Marketing, Marketing strategies based on product Life Cycle, Channels of distributions. **Strategic Management**: Vision, Mission, Goals, Strategy – Elements of Corporate Planning Process – Environmental Scanning – SWOT analysis- Steps in Strategy Formulation and Implementation, Generic Strategy alternatives	10
Unit – 4	
Project Management: **(PERT/CPM):** Development of Network – Difference between PERT and CPM Identifying Critical Path- Probability- Project Crashing (Simple Problems).	10
Unit – 5	
Contemporary Management Practices: Basic concepts of MIS, MRP, Justin- Time (JIT) system, Total Quality Management (TQM), Six sigma, Supply Chain Management, Enterprise Resource Planning (ERP), Business Process outsourcing (BPO), Business process Re-engineering and Bench Marking, Balanced Score Card.	10
Total	**48**

Course outcomes:

On completion of the course student will be able to

1. Define the Basic Concepts of Management and organization
2. Summarize the Statistical Quality Control Techniques, Methods of inspection, the concept of Inventory Management and Control
3. Identify the Customer Behavior and Employees Contribution towards success of Organization
4. Apply the techniques of project management to complete the project within the duration and cost.
5. Identify the various types of strategies for organizational development

Text Books:

1. A. R. Aryasri, Management Science, TMH, 2011.
2. P. G. Ramanujan, B.V.R. Naidu and Prof. P.V. Rama Sastry: Management Science, Himalaya Publishing House 2013.

Reference Books:

1. Koontz & Weinrich: 'Essentials of Management' TMH 2011.
2. Seth & Rastogi: Global Management Systems, Cengage Learning, Delhi, 2011.
3. Robbins: Organizational Behaviors, Pearson Publications, 2011

Soft Skills & Aptitude Builder - 1			
Subject Code	18CMAHS5090	IA Marks	15
Number of Practice Hours/Week	4	Exam Marks	35
Total Number of Practice Hours	64	Exam Hours	3
Credits - 2			
Section A - Soft Skills			
Unit – 1: Intrapersonal Communication			**Hours**
Introduction to Soft Skills and its Significance **Personal Effectiveness**: Who am I and What am I; My Strengths and Weaknesses; SWOT Analysis; SMART Goal Setting; Being Proactive **Principles of Personal Vision**: Beginning with the End in Mind; Time Management: Understanding Priorities; Put First-Things-First **Activity**: Psychometric Tests and SWOT Analysis, SMART Goal Setting			**11**
Unit 2: Interpersonal Communication			
Principles of Creative Cooperation and Organisation Skills: Think Win-Win; Seek First to Understand then to be Understood; Synergize; Life-Long Learning **Emotional Intelligence**: Self-Awareness, Self-Regulation, Empathy, Assertiveness, Adoptability, Managing Emotions **Activity**: Resolving a Conflict with your Friend/Colleague/Family Member; Group Discussions & Debates			**11**
Unit – 3: 21st Century Skills			
What are 21st Century Skills? Learning Skills- Digital Literacy- Life Skills **Critical Thinking**: Active Listening, Observation, Introspection, Analytical Thinking, Open Mindedness **Problem Solving**: Understanding the Complexity of the Problem, Defining the Problem, Cause and Effect Analysis, Exploring Possible Solutions, Planning Actions, Analysing Results of your Actions, Getting Feedback, Redefining the Problem, The Problem Solving Cycle **Decision Making**: Managing Conflict, Conflict Resolution, Methods of Decision Making, Effective Decision Making in Teams – Methods & Styles **Activity**: Case Study			**10**
Section B - Aptitude Builder			
Unit – 4: Ratios & Percentages			
Definition of Ratio, Properties of Ratios, Comparison of Ratios, Problems on Ratios, Compound Ratio, Problems on Proportion, Mean Proportional and Continued Proportion. **Partnership:** Introduction, Relation between Capitals, Period of Investments and Shares **Number System:** Classification of Numbers, Divisibility Rules, Finding the Units Digit,Finding Remainders in Divisions Involving Higher Powers, LCM and HCF Models **Percentages:** Introduction, Converting a Percentage into Decimals, Converting a Decimal into Percentage, Percentage Equivalent of Fractions, Problems on Percentages **Profit And Loss:** Problems on Profit and Loss Percentage, Relation between Cost Price and Selling Price, Discount and Marked Price, Two Different Articles Sold at Same Cost Price, Two Different Articles Sold at Same Selling Price Gain% / Loss% on Selling Price **Problems on Ages:** Introduction, Problems based on Ages **Averages:** Definition of Average, Rules of Average, Problems on Average, Problems on Weighted Average, Finding Average using Assumed Mean Method **Alligation and Mixture:** Problems on Mixtures, Alligation Rule, Problems on			**16**

Alligation	
Unit – 5: Mental Ability	
Difference Series, Product Series, Squares Series, Cubes Series, Alternate Series Combination Series, Miscellaneous Series, Place Values of Letters **Number and Letter Analogies:** Definition of Analogy, Problems on Number Analogy, Problems on Letter Analogy, Problems on Verbal Analogy **Odd Man Out:** Problems on Number Odd Man Out, Problems on Letter Odd Man Out, Problems on Verbal Odd Man Out **Coding and Decoding:** Coding using Same Set of Letter, Coding using Different Set of Letters, Coding into a Number, Problems on R-Model **Blood relations:** Defining the Various Relations among the Members of a Family, Solving Blood Relation Puzzles, Solving the Problems on Blood Relations using Symbols and Notations **Direction Sense:** Solving Problems by Drawing the Paths, Finding the Net Distance Travelled, Finding the Direction, Problems on Clocks ,Problems on Shadows	**16**

Section-A: Text (T) / Reference (R) Books:	
For Units 1, 2, & 3	
T1	English and Soft Skills, Dr. S. P. Dhanvel, Orient Blackswan, 2011
R1	Seven Habits of Highly Effective People, Stephen R Covey
R2	Emotional Intelligence, Daniel Goleman, Bantom Book, 2006
R3	21st Century Skills: Learning for Life in our Times, Bernie Trilling, Charles Fadel; John Wiley & Sons
For Units 4&5	
T1	R S Agarwal, S Chand, 'Quantitative Aptitude'
T2	R S Agarwal, S.Chand , 'A Modern Approach to Logical Reasoning'
R1	Quantitative Aptitude for CAT By Arun Sharma
R2	GL Barrons, Mc Graw Hills, Thorpe's Verbal Reasoning, LSAT Materials
Course Outcomes: On completion of this course, students can	
Section A: Soft Skills	
CO1	re-engineer attitude and understand its influence on behaviour
CO 2	develop interpersonal skills and be an effective goal oriented team player
CO 3	develop holistic personality with a mature outlook to function effectively in different circumstances
Section B: Aptitude Builder	
CO 4	solve the real-time problems for performing job functions easily
CO 5	analyse the problems logically and critically

Course Outcomes to Programs Outcomes Mapping: (1: Low, 2: Medium, 3: High)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	-	-	-	-	-	-	-	1	-	3	-	-	-
2	-	-	-	-	-	-	-	-	2	1	-	3	-	-	-
3	-	-	-	-	-	-	-	-	1	1	-	3	-	-	-

4	2	2	-	1	-	-	-	-	-	-	-	1	-	-	-
5	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-
Course	2	2	-	2	-	-	-	-	2	1	-	3	-	-	-

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 03

Unit -1: Introduction	**Hours**
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	**08**
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**08**
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	**12**
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	**12**

genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms**. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

Soft Skills & Aptitude Builder - 2			
Subject Code	21ETETS6090	**IA Marks**	**15+15**
Number of Lecture Hours/Week	**2**	**Exam Marks**	**35+35**
Total Number of Lecture Hours	**32**	**Exam Hours**	**3**
Credits - 2			

Unit – 1: Communicative Competence	**Hours**
Verbal Reasoning: Reading Comprehension-Text Completion- Sentence EquivalenceSpotting Errors, Sequencing of Sentences, Parallelism in Structure E-Mail Etiquette, Reporting NewsActivity: Completing Exercises	**6**
Unit 2: Career and Employability Skills	
What is a Career: Career vs Job, Career Values & Grid, Skills vs Strengths, Spotting Skills/Reflection of Present Skills, Meeting the Expectation of your Employer, Matching your Skills with the Required Skills, Preparing Resume, Preparing for Interviews & Structuring Answers Activity: Resume Building, Interviews	**6**
Section B,Aptitude Builder	
Unit – 3: Time and Work	
Pipes and Cisterns: Problems on Unitary method, Relation between Men, Days, Hours and Work, Problems on Man-Day-Hours Method, Problems on Alternate Days, Problems on Pipes and Cisterns. **Time , Distance and Speed, Problems on Trains, Boats and Streams:** Relation between Speed, Distance and Time, Converting km/h into m/s and vice versa , Problems on Average Speed, Problems on Relative Speed, Problems on Circular Tracks, Problems on Races **Problems on Trains:** Two Trains Moving in Opposite Direction, Two Trains Moving in same Direction, A Train Crossing a Stationary Object of a Given Length like a Platform or Bridge, A Train Crossing a Stationary Object like a Pole or a Man **Boats and Streams:** Time Based, which can be considered as a Point Object Speed Based, Distance Based, Average Speed Based	**6**
Unit – 4: Logical and Analytical Reasoning	
Seating Arrangement: Linear Arrangement, Circular Arrangement, Tabler, Triangular Arrangement, Complex Arrangement. **Clocks :** Finding the Angle When the Time is Given, Finding the Time When the Angle is Known, Relation between Angles, Minutes and Hours, Position of Hands of the Clock, Time Gained or Lost by the Clock, Mirror /Water Image-based Time. **Calendars :** Definition of a Leap Year, Finding the Number of Odd Days, Framing the Year Code for Centuries, Finding the Day of any Random Calendar Date **Syllogisms:** Finding the Conclusions using Venn Diagram Method, Finding the Conclusions using Syllogism Method **Simple Interest:** Definitions, Problems on Interest and Amount, Problems when Rate of Interest and Time Period are Numerically Equal **Compound Interest:** Definition and Formula for Amount in Compound Interest,	**7**

Difference between Simple Interest and Compound Interest for 2 Years on the Same Principle and Time Period.		
Unit – 5: Permutations, Probability, Areas and Volumes		
Definition of permutation , Problems on Permutations , Definition of Combinations , problems on Combinations **Probability:** Definition of Probability, Problems on Coins, Problems on Dice, Problems on Deck of Cards , Problems on Years **Mensuration - 2D:**Formulas for Areas, Formulas for Volumes of Different Solids, Problems on Areas **Mensuration - 3D:** Problems on Volumes, Problems on Surface Areas		7
Text (T) / Reference (R) Books:		
For Units 1 & 2		
T1	**Enhance Your Employability Skills, David Winter and Laura Brammar, University of London**	
T2	**R.S. Agarwal, Verbal & Non-Verbal Reasoning, S. Chand & Co., Latest ed. 2003**	
R2	**How to Prepare for Verbal Ability and Reading Comprehension, Arun Sharma, Meenakshi Upadhay, Mc Graw Hill**	
For Units 3, 4, & 5		
T1	R S Agarwal, S Chand, 'Quantitative Aptitude'	
T2	R S Agarwal, S.Chand , 'A modern approach to Logical reasoning'	
R1	Quantitative Aptitude for CAT By Arun sharma	
R2	GL Barrons, Mc Graw Hills, Thorpe's verbal reasoning, LSAT Materials	
Course Outcomes: On completion of this course, students can		
Section A: Soft Skills		
CO 1	**learn and practice effective communication skills**	
CO 2	**develop broad career plans, evaluate the employment market, and become industry ready**	
Section B: Aptitude Builder		
CO 3	**develop accuracy on time and distance and units related solutions**	
CO 4	**solve the real-time problems for performing job functions easily**	
CO 5	**solve problems related to permutations and combinations, probability, areas and volumes**	

1.3.1
ME

REGULATIONS, COURSE STRUCTURE AND SYLLABUS

(Aligned with AICTE Model Curriculum & APSCHE Curriculum)

SITE 21 REGULATIONS

For

B.Tech.

Civil Engineering

With effective from the Academic Year

2021-2022

COURSE STRUCTUREAND SYLLABUS
SITE-21 REGULATIONS

For
B.Tech.
Civil Engineering

With effective from the Academic Year 2021-22

sasi INSTITUTE OF TECHNOLOGY & ENGINEERING
Department of Civil Engineering

Accredited by **NAAC** with **"A"** Grade
Recognised by **UGC** under section 2(f) &12(B)
Approved by **AICTE** - NEW Delhi
Permanently Affiliated to **JNTUK, SBTET**
Ranked as **"A" Grade** by Govt. of A.P.

Course structure for the Academic Year 2021-22

B. Tech. (Civil Engineering)
Semester I (First Year)
Approved Course structure

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CMMAT1010	Engineering Mathematics - I	3	1	0	3
2	21CEPHT1020	Engineering Physics	3	0	0	3
3	21CMCHT1030	Engineering Chemistry	3	0	0	3
4	21CMCST1040	Programming for Problem solving	3	0	0	3
5	21CEMEL1050	Engineering Graphics	2	0	2	3
6	21CEPHL1060	Engineering Physics Lab	0	0	3	1.5
7	21CMCHL1070	Engineering Chemistry Lab	0	0	3	1.5
8	21CMCSL1080	Programming for Problem Solving Lab	0	0	3	1.5
9	21CMMSN1090	Constitution of India, Professional ethics and Human values	2	0	0	0
					Total Credits	19.5

B.Tech. (Civil Engineering)
Semester II (First year)
Approved Course structure

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CMEGT2010	Technical English	3	0	0	3
2	21CMMAT2020	Engineering Mathematics - II	3	1	0	3
3	21CMEET2030	Basic Electrical Engineering	3	0	0	3
4	21CMCST2040	Python Programming	2	0	2	3
5	21ETETT2050	Engineering Mechanics	3	0	0	3
6	21CMEGL2060	English Communication Skills Lab	0	0	3	1.5
7	21CMEEL2070	Basic Electrical Engineering Lab	0	0	3	1.5
8	21CEMEL2080	Engineering Workshop Lab	0	0	3	1.5
9	21CMCHN2090	Environmental Science	2	0	0	0
					Total Credits	19.5

B.Tech. (Civil Engineering)
Semester III (Second year)
Approved Course structure

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CEMAT3010	Engineering Mathematics - III	3	0	0	3
2	21CECET3020	Mechanics of Solids	3	0	0	3
3	21CECET3030	Fluid Mechanics	3	0	0	3
4	21CECET3040	Building Materials, Construction & Concrete Technology	3	0	0	3
5	21CECET3050	Surveying and Geomatics	3	0	0	3
6	21CECEL3060	Concrete Technology Lab	0	0	3	1.5
7	21CECEL3070	Surveying Field Work	0	0	3	1.5
8	21CECEL3080	Strength of Materials Lab	0	0	3	1.5
9	21CECES3090	Computer Aided Civil Engineering Drawing (SOC)	1	0	2	2
10	21CECEN3100	Essence of Indian Traditional Knowledge Mandatory course (AICTE suggested)	2	0	0	0
					Total Credits	21.5

B.Tech. (Civil Engineering)
Semester IV (Second year)
Approved Course structure

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CEMAT4010	Engineering Mathematics - IV	3	0	0	3
2	21CECET4020	Structural Analysis	3	0	0	3
3	21CECET4030	Engineering Geology	3	0	0	3
4	21CECET4040	Hydraulic & Hydraulics Machinery	3	0	0	3
5	21CMMST4050	Engineering Economics & Financial Management	3	0	0	3
6	21CECEL4060	Engineering Geology Lab	0	0	3	1.5
7	21CECEL4070	Fluid Mechanics and Hydraulic Machinery Lab	0	0	3	1.5
8	21CECEL4080	Building Planning & Drawing	1	0	2	1.5
9	21CECES4090	Advanced Surveying (SOC)	1	0	2	2
					Total Credits	21.5
		Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

B.Tech. (Civil Engineering)
Semester V (Third year)

S. No	Subject Code	Name of the subject	L	T	P	Cr
1	21CECET5010	Soil Mechanics	3	0	0	3
2	21CECET5020	Transportation Engineering	3	0	0	3
3	21CECET5030	Design and Drawing of Reinforced Concrete Structures	3	0	0	3
4	21CECEP504x	Professional Elective - I	3	0	0	3
5	21CExxO505x	Open Elective course - I	2	0	2	3
6	21CECEL5060	Soil Mechanics Lab	0	0	3	1.5
7	21CECEL5070	Transportation Engineering Lab	0	0	3	1.5
8	21CMAHS5080	Soft Skills & Aptitude Builder - 1	1	0	2	2
9	21CECEN5090	Disaster Management Mandatory course (AICTE suggested)	2	0	0	0
10	21CECER5100	Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester	0	0	3	1.5
					Total Credits	21.5
		Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

S.No	Professional Electives	Subject Code	Name of the subject	L	T	P	Cr
1	PE1	21CECEP504a	Advanced Concrete Technology	3	0	0	3
2		21CECEP504b	Open Channel flow	3	0	0	3
3		21CECEP504c	Advanced Structural Analysis	3	0	0	3
4		21CECEP504d	Remote Sensing and GIS	3	0	0	3

Open Electives:

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21xxCEOxxxx	Geo-Spatial Technologies	3	0	0	3
2	21xxCEOxxxx	Industrial Waste Water Treatment	3	0	0	3
3	21xxCEOxxxx	Smart Cities	3	0	0	3
4	21xxCEOxxxx	Building Materials	3	0	0	3
5	21xxCEOxxxx	Elements of Civil Engineering	3	0	0	3
6	21xxCEOxxxx	Watershed Management	3	0	0	3
7	21xxCEOxxxx	Air, Noise Pollution and Control	3	0	0	3
8	21xxCEOxxxx	Civil - Engineering societal global impact	3	0	0	3
9	21xxCEOxxxx	Environmental Pollution & Control	3	0	0	3
10	21xxCEOxxxx	Green Buildings	3	0	0	3

B.Tech. (Civil Engineering)
Semester VI (Third year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CECET6010	Hydrology and Water Resources Engineering	3	0	0	3
2	21CECET6020	Design and Drawing of Steel Structures	3	0	0	3
3	21CECET6030	Environmental Engineering	3	0	0	3
4	21CECEP604x	Professional Elective - II	3	0	0	3
5	21CExxO605x	Open Elective course - II	2	0	2	3
6	21CECEL6060	Environmental Engineering Lab	0	0	3	1.5
7	21CECEL6070	RS & GIS LAB	0	0	3	1.5
8	21CECEL6080	Irrigation Design and Drawing Lab	0	0	3	1.5
9	21CMAHS6090	Soft Skills & Aptitude Builder - 2	1	0	2	2
10	21CMBIN6100	Biology for Engineers	2	0	0	0
			Total Credits			21.5
		Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4
Industrial/Research Internship (Mandatory) 2 months during summer vacation						

S.No	Professional Electives	Subject Code	Name of the subject	L	T	P	Cr
1	PE2	21CECEP604a	Foundation Engineering	3	0	0	3
2		21CECEP604b	Offshore Structures	3	0	0	3
3		21CECEP604c	Pavement Design	3	0	0	3
4		21CECEP604d	Urban Hydrology	3	0	0	3

Open Electives:

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21xxCEOxxxx	Geo-Spatial Technologies	3	0	0	3
2	21xxCEOxxxx	Industrial Waste Water Treatment	3	0	0	3
3	21xxCEOxxxx	Smart Cities	3	0	0	3
4	21xxCEOxxxx	Building Materials	3	0	0	3
5	21xxCEOxxxx	Elements of Civil Engineering	3	0	0	3
6	21xxCEOxxxx	Watershed Management	3	0	0	3
7	21xxCEOxxxx	Air, Noise Pollution and Control	3	0	0	3
8	21xxCEOxxxx	Civil - Engineering societal global impact	3	0	0	3
9	21xxCEOxxxx	Environmental Pollution & Control	3	0	0	3
10	21xxCEOxxxx	Green Buildings	3	0	0	3

B.Tech. (Civil Engineering)
Semester VII (Fourth year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CECEP701x	Professional Elective - III	3	0	0	3
2	21CECEP702x	Professional Elective - IV	3	0	0	3
3	21CECEP703x	Professional Elective - V	3	0	0	3
4	21CExxO704x	Open Elective courses - III	2	0	2	3
5	21CExxO705x	Open Elective courses - IV	2	0	2	3
6	21CMMST7060	Management Science	3	0	0	3
7	21CECES7070	Software Applications in Civil Engineering Lab (SOC)	1	0	2	2
Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester)			0	0	6	3
		Total Credits				23
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)			4	0	0	4

S.No	Professional Electives	Subject Code	Name of the subject	L	T	P	Cr
1	PE3	21CECEP701a	Prestressed Concrete	3	0	0	3
2		21CECEP703b	Ground Water Development & Management	3	0	0	3
3		21CECEP703c	Soil Dynamics and Machine Foundation	3	0	0	3
4		21CECEP703d	Air and Noise Pollution and Control	3	0	0	3
1	PE4	21CECEP702a	Solid Waste & Hazardous Waste Management	3	0	0	3
2		21CECEP702b	Ground Improvement Techniques	3	0	0	3
3		21CECEP702c	Hydraulic Structures	3	0	0	3
4		21CECEP702d	Bridge Engineering	3	0	0	3
1	PE5	21CECEP703a	Construction, Specifications and Project Management	3	0	0	3
2		21CECEP703b	Railway, Airport Docks and Harbors	3	0	0	3
3		21CECEP703c	Repair and rehabilitation of structures	3	0	0	3
4		21CECEP703d	Earth and rock fill dams	3	0	0	3

Open Electives:

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21xxCEOxxxx	Geo-Spatial Technologies	3	0	0	3
2	21xxCEOxxxx	Industrial Waste Water Treatment	3	0	0	3
3	21xxCEOxxxx	Smart Cities	3	0	0	3
4	21xxCEOxxxx	Building Materials	3	0	0	3
5	21xxCEOxxxx	Elements of Civil Engineering	3	0	0	3
6	21xxCEOxxxx	Watershed Management	3	0	0	3
7	21xxCEOxxxx	Air, Noise Pollution and Control	3	0	0	3
8	21xxCEOxxxx	Civil - Engineering societal global impact	3	0	0	3
9	21xxCEOxxxx	Environmental Pollution & Control	3	0	0	3
10	21xxCEOxxxx	Green Buildings	3	0	0	3

B.Tech. (Civil Engineering)
Semester VIII (Fourth year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CECER8010	Project work, seminar and internship in industry	0	0	24	12
					Total Credits	12

Humanities and Social Sciences courses:

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CMEGT2010	Technical English	3	0	0	3
2	21CMMST4050	Engineering Economics & Financial Management	3	0	0	3
3	21CEHMS7060	Management Science	3	0	0	3
4	21CMEGL2060	English Communication Skills Lab	3	0	0	1.5
					Total	10.5

Basic Sciences courses and Labs

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CMMAT1010	Engineering Mathematics - I	3	0	0	3
2	21CEPHT1020	Engineering Physics	3	0	0	3
3	21CMCHT1030	Engineering Chemistry	3	0	0	3
4	21CMMAT2020	Engineering Mathematics - II	3	0	0	3
5	21CEMAT3010	Engineering Mathematics - III	3	0	0	3
6	21CEMAT4020	Engineering Mathematics - IV	3	0	0	3
7	21CEPHL1060	Engineering Physics Lab	0	0	3	1.5
8	21CMCHL1070	Engineering Chemistry Lab	0	0	3	1.5
Total						21

Engineering Sciences courses and Labs

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CMCST1040	Programming for Problem solving	3	0	0	3
2	21CEMEL1050	Engineering Graphics	3	0	0	3
3	21CMEET2030	Basic Electrical Engineering	3	0	0	3
4	21CMCST2040	Python Programming	3	0	0	3
5	21ETETT2050	Engineering Mechanics	3	0	0	3
6	21CECET4030	Engineering Geology	3	0	0	3
7	21CMCSL1080	Programming for Problem Solving Lab	0	0	3	1.5
8	21CMEEL2070	Basic Electrical Engineering Lab	0	0	3	1.5
9	21CEMEL2080	Engineering Workshop Lab	0	0	3	1.5
10	21CECEL4060	Engineering Geology Lab	0	0	3	1.5
Total						24

Professional Core courses and Labs

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CECET3020	Mechanics of Solids	3	0	0	3
2	21CECET3030	Fluid Mechanics	3	0	0	3
3	21CECET3040	Building Materials & Concrete Technology	3	0	0	3
4	21CECET3050	Surveying and Geomatics	3	0	0	3
5	21CECET4020	Structural Analysis	3	0	0	3
6	21CECET4040	Hydraulic & Hydraulics Machinery	3	0	0	3
7	21CECET5010	Geotechnical Engineering	3	0	0	3
8	21CECET5020	Transportation Engineering	3	0	0	3

9	21CECET5030	Design and Drawing of Reinforced Concrete Structures	3	0	0	3
10	21CECET6010	Hydrology and Water Resources Engineering	3	0	0	3
11	21CECET6020	Design and Drawing of Steel Structures	3	0	0	3
12	21CECET6030	Environmental Engineering	3	0	0	3
13	21CECEL3060	Concrete Technology Lab	0	0	3	1.5
14	21CECEL3070	Surveying Field Work	0	0	3	1.5
15	21CECEL3080	Strength of Materials Lab	0	0	3	1.5
16	21CECEL4070	Fluid Mechanics and Hydraulic Machinery Lab	0	0	3	1.5
17	21CECEL4080	Building Planning & Drawing	0	0	3	1.5
18	21CECEL5060	Geotechnical Engineering Lab	0	0	3	1.5
19	21CECEL5070	Transportation Engineering LAB	0	0	3	1.5
20	21CECEL6060	Environmental Engineering Lab	0	0	3	1.5
21	21CECEL6070	RS & GIS LAB	0	0	3	1.5
22	21CECEL6080	Irrigation Engineering Drawing Lab				1.5
					Total Credits	51

Professional Electives

S.No	Professional Electives	Subject Code	Name of the subject	L	T	P	Cr
1	PE1	21CECEP504a	Advanced Concrete Technology	3	0	0	3
2		21CECEP504b	Open Channel flow	3	0	0	3
3		21CECEP504c	Advanced Structural Analysis	3	0	0	3
4		21CECEP504d	Remote Sensing and GIS	3	0	0	3
1	PE2	21CECEP604a	Advanced Foundation Engineering	3	0	0	3
2		21CECEP604b	Offshore Structures	3	0	0	3
3		21CECEP604c	Advanced Transportation Engineering	3	0	0	3
4		21CECEP604d	Construction, Specifications and Project Management	3	0	0	3
1	PE3	21CECEP701a	Prestressed Concrete	3	0	0	3
2		21CECEP703b	Ground Water Development	3	0	0	3
3		21CECEP703c	Ground Improvement Techniques	3	0	0	3
4		21CECEP703d	Air and Noise Pollution and Control	3	0	0	3
1	PE4	21CECEP702a	Solid Waste & Hazardous Waste Management	3	0	0	3
2		21CECEP702b	Soil dynamics and machine foundation	3	0	0	3
3		21CECEP702c	Hydraulic Structures	3	0	0	3
4		21CECEP702d	Bridge Engineering	3	0	0	3
1	PE5	21CECEP703a	Urban Hydrology	3	0	0	3
2		21CECEP703b	Railway, Airport Docks and Harbors	3	0	0	3
3		21CECEP703c	Repair and rehabilitation of structures	3	0	0	3
4		21CECEP703d	Earth and rock fill dams	3	0	0	3
					Total Credits		15

Honors

S.No	Honors	Subject Code	Name of the subject	L	T	P	Cr
1	POOL I		Finite Element Methods	4	0	0	4
2			Earthquake Resistant Design of Structures	4	0	0	4
3			Advanced Structural Design	4	0	0	4
4			Bridge engineering	4	0	0	4
1	POOL 2		Rock Mechanics	4	0	0	4
2			Foundation Engineering	4	0	0	4
3			Advanced Foundation Engineering	4	0	0	4
4			Earth and Rock Fill Dams	4	0	0	4
1	POOL 3		Highway Engineering	4	0	0	4
2			Pavement Analysis design	4	0	0	4
3			Intelligent transport systems	4	0	0	4
4			Traffic Engineering and Management	4	0	0	4
1	POOL 4		Environmental Laws and Policy	4	0	0	4
2			Environmental Change and sustainable development	4	0	0	4
3			Physico-Chemical Processes for Water and Wastewater Treatment	4	0	0	4
4			Environmental Impact Assessment and Management	4	0	0	4

Open Electives:

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21xxCEOxxxx	Geo-Spatial Technologies	3	0	0	3
2	21xxCEOxxxx	Industrial Waste Water Treatment	3	0	0	3
3	21xxCEOxxxx	Smart Cities	3	0	0	3
4	21xxCEOxxxx	Building Materials	3	0	0	3
5	21xxCEOxxxx	Elements of Civil Engineering	3	0	0	3
6	21xxCEOxxxx	Watershed Management	3	0	0	3
7	21xxCEOxxxx	Air, Noise Pollution And Control	3	0	0	3
8	21xxCEOxxxx	Civil - Engineering societal global impact	3	0	0	3
9	21xxCEOxxxx	Environmental Pollution & Control	3	0	0	3
10	21xxCEOxxxx	Green Buildings	3	0	0	3
Total credits						12

Skill oriented course:

S.No	Subject Code	Title of the certificate course	L	T	P	Cr
1	21CECES3090	Computer Aided Civil Engineering Drawing	1	0	2	2
2	21CECES4090	Advanced Surveying (SOC)	1	0	2	2
3	21CMAHS5080	Soft Skills & Aptitude Builder - 1	1	0	2	2
4	21CMAHS6090	Soft Skills & Aptitude Builder - 2	1	0	2	2
5	21CECES7070	Software Applications in Civil Engineering Lab (SOC)	1	0	2	2
					Total credits	10

MOOC courses

S.No	Name of the subject	https://onlinecourses.swayam2.ac.in/nou20_cs11/preview	L	T	P	Cr
1	Building Cost Estimation Simplified	https://nptel.ac.in/courses/105103207	2	0	0	2
2	Advanced soil Mechanics	https://onlinecourses.nptel.ac.in/noc21_ce08/preview	2	0	0	2
3	Digital Land Surveying and Mapping (DLS&M)	https://nptel.ac.in/courses/105107181	2	0	0	2
4	Environmental Remediation of Contaminated Sites	https://onlinecourses.nptel.ac.in/noc22_ce26/preview	2	0	0	2
5	Geographic Information Systems	https://nptel.ac.in/courses/105106052	2	0	0	2
6	Geosynthetics and Reinforced Soil Structures	https://onlinecourses.nptel.ac.in/noc22_ce45/preview	2	0	0	2
7	Rural water resources management	https://archive.nptel.ac.in/courses/105/106/105106202/	2	0	0	2
8	Maintenance and repair of concrete structures	https://nptel.ac.in/courses/105106053	2	0	0	2
9	Modern construction materials	https://onlinecourses.nptel.ac.in/noc22_ce31/preview	2	0	0	2
10	Probability methods in civil engineering	https://onlinecourses.swayam2.ac.in/nou20_cs11/preview	2	0	0	2

Mandatory courses

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CMCHN1090	Constitution of India, Professional ethics and Human rights	2	0	0	0
2	21CMCHN2090	Environmental Science	2	0	0	0
3	21CMCHN3090	Essence of Indian Traditional Knowledge	2	0	0	0
4	21CECEN5090	Disaster Management	2	0	0	0
5	21CMBIN6100	Biology for Engineers	2	0	0	0

SUGGESTED COURSES FOR MINOR PROGRAM IN CE

The following are the Offline and MOOC courses offered by CE Departmet for the Minors program

Starting from IV semster.

S.No	Subject Code	Name of the subject	Offered Semester	L	T	P	Cr
1		Building materials	IV Semester	3/4	0	0/2	4
2		Solid Waste & Hazardous Waste Management	V Semester	3/4	0	0/2	4
3		Traffic engineering	VI Semester	3/4	0	0/2	4
4		Ground Improvement Techniques	VII Semester	3/4	0	0/2	4

MOOC/NPTEL Courses for Minor program:

S.No	Name of the subject	Link	L	T	P	Cr
1	Digital Land Surveying and Mapping (DLS&M)	https://nptel.ac.in/courses/105107181	2	0	0	2
2	Environmental Remediation of Contaminated Sites	https://onlinecourses.nptel.ac.in/noc22_ce26/preview	2	0	0	2
3	Geographic Information Systems	https://nptel.ac.in/courses/105106052	2	0	0	2

S.No	Name of the subject	Link	L	T	P	Cr
1	Rural water resources management	https://archive.nptel.ac.in/courses/105/106/105106202/	2	0	0	2
2	Modern construction materials	https://onlinecourses.nptel.ac.in/noc22_ce31/preview	2	0	0	2
3	Probability methods in civil engineering	https://onlinecourses.swayam2.ac.in/nou20_cs11/preview	2	0	0	2

Note:

1. Students has to study all four regular/offline minor courses starting from **IV semster** and complete by **VII semester** by taking **one course per semester**.
2. Additionally, TWO MOOC courses of minimum EIGHT-week duration a total covering of 4 credits (offered by CE Department only).
3. Students can register for any two MOOC courses and one from each pool out of three courses listed in the each pool in the above table via the NPTEL online platform from IV semester to VII semester by prior information to concerned department.

M.Rama Rao
HoD

Head of the Dept - Civil
Sasi Institute of Technology & Engineering
TADEPALLIGUDEM - 534 101

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS (Common to all Branches)			
Subject Code	21CMMSN1090/21CMMSN2090	IA Marks	30
Number of Lecture Hr/week	03	Exam Marks	70
Total Number of Lecture Hr	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit - I	**Hours**
Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**10**
Unit - II	
Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**10**
Unit – III	
State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**10**
Unit –IV	
Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	**10**
Unit – V	
Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity & Reliability

TEXT BOOKS:

1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice – Hall EEE, 19th / 20th Edn., 2001

2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE SEMESTER – III			
Subject Code	**21CECEN3100**	Internal Marks	30
Number of Lecture Hours/Week	02	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

Course Objectives:

The objectives of this course is enable the students to

1. Understand the concept of Traditional knowledge and its importance
2. Know the need and importance of protecting traditional knowledge.
3. Know the various enactments related to the protection of traditional knowledge.
4. Understand the concepts of Intellectual property to protect the traditional knowledge.

Unit -1	**Hours**
Introduction to Traditional Knowledge Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, the physical and social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge vis-à-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge vis-à-vis formal knowledge	**10**
Unit -2	
Protection of Traditional Knowledge Protection of traditional knowledge: The need for protecting traditional knowledge Significance of TK Protection, value of TK in global economy, Role of Government to harness TK.	**10**
Unit – 3	
Legal framework and TK: A: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmer's Rights Act, 2001 (PPVFR Act); B: The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016. Geographical indicators act 2003	**10**
Unit – 4	
Traditional Knowledge and Intellectual Property: Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Certain non IPR mechanisms of traditional knowledge protection, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge, global legal FORA for increasing protection of Indian Traditional Knowledge.	**10**
Unit – 5	
Traditional Knowledge in Different Sectors: Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK. 139.	**10**

Course Outcomes:

At the end of this course the student will be able to

1. Understand and elucidate the basic knowledge of traditional knowledge to develop the physical and social changes on traditional knowledge system.
2. Describe the significance of traditional knowledge protection to communicate the traditional knowledge information
3. Recognize the role of government on traditional knowledge to measure its impact on global economy.
4. Explain the acts related to schedule tribes, traditional forest dwellers, plants protection and farmers to inculcate the legal protection information.
5. Illustrate the rules of biological diversity and geographical indicators for the protection of traditional knowledge bill.

TEXT BOOKS

1. Traditional Knowledge System in India, by Amit Jha, 2009
2. Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, Pratibha Prakashan 2012.

REFERENCES

1. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002.
2. Knowledge Traditions and Practices of India" Kapil Kapoor1, Michel Danino2

ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT			
Subject Code	**21CMMST4050**	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits-03			

Course objectives:

1. To understand the concept and nature of Managerial Economics and Concept of Demand and Demand forecasting.
2. To understand the concept of Production function, Input Output relationship, Cost Concepts and Concept of Cost-Volume-Profit Analysis.
3. To understand the Market structures, significance of various pricing methods and different forms of Business organization and the concepts of Business Cycles.
4. To understand the different Accounting Systems preparation of Financial Statements and uses of different tools for performance evaluation
5. To understand the concept of Capital, Capitalization, Capital Budgeting and to know the techniques used to evaluate Capital Budgeting proposals by using different methods.

Unit -I: Introduction to Managerial Economics and demand Analysis	
Definition of Managerial Economics and Scope-Managerial Economics and its relation with other subjects-Concepts of Demand-Types-Determents-Law of Demand its Exception-Elasticity of Demand-Types and Measurement- Demand forecasting and its Methods.	**10 Hours**
Unit -II: Production and Cost Analysis	
Production function- Law of Variable proportions- Isoquants and Isocost-Cobb-Douglas Production function-Economics of Scale-Cost Concepts- Cost Volume Profit analysis-Determination of Break-Even Point (Simple Problems).	**10 Hours**
Unit-III: Introduction To Markets, Pricing Policies & forms Organizations and Business Cycles	
Market Structures: Perfect Competition, Monopoly and Monopolistic and Oligopoly – Features – Price,Output Determination – Methods of Pricing: Strategies of Pricing & process for selecting final price-. Features and Evaluation of Sole Trader – Partnership – Joint Stock Company – State/Public Enterprises and their forms – Business Cycles –Phases of Business Cycle	**10 Hours**
Unit –IV: Introduction to Accounting & Financing Analysis	
Introduction to Double Entry Systems – Journal entry-Ledger-Trail Balance-Final Accounts-Preparation of Financial Statements- Analysis and Interpretation of Financial Statements-Ratio Analysis.	**10 Hours**
Unit-V: Capital and Capital Budgeting	
Capital Budgeting: Meaning of Capital-Capitalization-Meaning of Capital Budgeting-Need for Capital Budgeting-Techniques of Capital Budgeting-Traditional and Modern Methods.	**10 Hours**

Course outcomes:

1. Students are equipped with the knowledge of managerial economics and estimating demand for a product.
2. Students understand Production and Cost concepts, estimating Cost Break even Analysis.

3. Students are equipped with the knowledge on Markets and Pricing methods along with Business Cycles.
4. Students are able to understand Accounting Concepts and Prepare Financial Statements-Analysis
5. Students are able to analyse various investment project proposals with the help of Capital Budgeting techniques.

Text Books:

1. Dr. A. R. Aryasri – Managerial Economics and Financial Analysis, TMH 2011.
2. B. Kuberadu Managerial Economics and Financial Analysis, 1/e, HPH, 2013
3. Dr. P. Vijaya Kumar & Dr. N. Apparao Management Science Cengage, Delhi, 2012.

Reference Books:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 4th Ed.
3. Koontz and weihrich: Essentials of management, TMH 2011
4. Seth& Rastogi: Global management systems, cengage learning,delhi,2011
5. V. Maheswari: Managerial Economics, Sultan Chand.
6. Dr. B. Kuberudu and Dr. T. V. Ramana: Managerial Economics & Financial Analysis, Himalaya Publishing House 2011.
7. Vanitha Agarwal : Managerial Economics, Pearson Publications 2011.
8. Sanjay Dhameja: Financial Accounting for Managers, Pearson.
9. Maheswari : Financial Accounting, Vikas Publications.
10. S. A. Siddiqui & A. S. Siddiqui: Managerial Economics and Financial Analysis, New Age International Publishers, 2012.

ENVIRONMENTAL POLLUTION & CONTROL SEMESTER –			
Subject code	21xxCEOxxxx	Internal Marks	30
Number of Hours/Week	03	Exam Marks	70
Total Number of Lecture hours	50	Exam Hours	3
Credits -03			

Course Objectives: This course will enable students to:

1. Impart knowledge on fundamental aspects of air pollution & control, noise pollution, and solid waste management.
2. Provide basic knowledge on waste water management.
3. Provide basic knowledge on solid waste management.
4. Introduces some basics of sanitation methods essential for protection of community health.
5. Differentiate the solid and hazardous waste based on characterization

Unit- I Air Pollution and Noise Pollution	**Hours**
Air Pollution: Air pollution Control Methods–Particulate control devices – Methods of Controlling Gaseous Emissions – Air quality standards. **Noise Pollution**: Noise standards, Measurement and control methods – Reducing residential and industrial noise – ISO14000.	**10**
UNIT–II Industrial Wastewater Management	
Industrial Wastewater Management: – Strategies for pollution control - Volume and Strength reduction – Neutralization – Equalization – Proportioning – Common Effluent Treatment Plants - Recirculation of industrial wastes – Effluent standard	**10**
UNIT–III Solid Waste Management	
Solid Waste Management: Solid waste characteristics – basics of on-site handling and collection separation and processing - Incineration- Composting-Solid waste disposal methods – fundamentals of Land filling.	**10**
UNIT–IV Environmental Sanitation	
Environmental Sanitation: Environmental Sanitation Methods for Hostels and Hotels, Hospitals, Swimming pools and public bathing places, social gatherings (melas and fares), Schools and Institutions, Rural Sanitation-low-cost waste disposal methods	**10**
UNIT-V Hazardous Waste Management	
Hazardous Waste Management: Characterization - Nuclear waste – Biomedical wastes – Electronic wastes - Chemical wastes – Treatment and management of hazardous waste-Disposal and Control methods.	**10**

Course outcomes:

By the end of successful completion of this course, the students will be able to:

1. Identify the air pollutant control devices
2. Have knowledge on the NAAQ standards and air emission standards
3. Differentiate the treatment techniques used for sewage and industrial wastewater treatment methods.
4. Understand the fundamentals of solid waste management, practices adopted in his town/village and its importance in keeping the health of the city.
5. Appreciate the methods of environmental sanitation and the management of community facilities without spread of epidemics.

TEXT BOOKS:

1. Air Pollution and Control, K V S G Murali Krishna, Laxmi Publications, New Delhi 2015.
2. Environmental Engineering, by Ruth F. Weiner and Robin Matthews – 4th Edition Elesevier, 2003.
3. Environmental Science and Engineering by J.G. Henry and G.W. Heinke – Pearson Education, 1996.
4. Environmental Engineering by Mackenzie L Davis & David A Cornwell. McGraw Hill Publishing, 2012.

REFERENCES:

1. Air Pollution and Control by M.N. Rao & H.N. Rao, 2017.
2. Solid Waste Management by K. Sasi Kumar, S.A. Gopi Krishna. PHI New Delhi, 2013.
3. Environmental Engineering by Gerard Kiley, Tata McGraw Hill.
4. Industrial Water Pollution Control by Nemerow Jr., McGraw Hill Publishing, 1999.
5. Unit Operations and Processes in Environmental Engineering by Reynolds. Richard – Cengage Learning.
6. Environmental Engineering by D. Srinivasan, PHI Learning Private Limited, New Delhi, 2011.
7. Environmental Engineering – Howard S. Peavy, Donald R. Rowe, Teorge George Tchobanoglus – Mc-Graw-Hill Book Company, New Delhi, 1985.

Online resources:

1. https://archive.nptel.ac.in/courses/123/105/123105001/

ENVIRONMENTAL ENGINEERING SEMESTER – VI			
Subject Code	21CECET6030	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course Objectives:

This course will enable students to:

1. Outline planning and the design of water supply systems for a community/town/city
2. Provide knowledge of water quality requirement for domestic usage and other usage
3. Impart understanding of importance of protection of water source quality
4. Selection of valves and fixture in water distribution systems for water supply system.
5. Impart knowledge on design of water distribution network

Unit -1 Introduction:	
Water: - Water Supply systems, Need for planned water supply schemes, Sources of Water, Water demand and Potable, industrial and agricultural water requirements. Role of Environmental Engineer. Importance and Necessity of Protected Water Supply systems, Water borne diseases, Flow chart of public water supply system.	**Hours – 10**
Unit -2 Water Demand, Quantity Estimation and colletion:	
Water Demand and Quantity Estimation: Estimation of water demand for a town or city, Per capita Demand and factors influencing it- Types of water demands and its variations- factors affecting water demand, Design Period, Factors affecting the Design period, Population Forecasting. Collection of water: Intake methods	**Hours – 10**
Unit – 3 Qualitative analysis and treatment of water:	
Qualitative analysis: Drinking water standards; Physical, chemical, and bacteriological analysis of water. **Treatment of Water:** Flowchart of water treatment plant, Treatment methods: Theory and Design of Sedimentation, Coagulation, Sedimentation with Coagulation, Filtration. Disinfection: Theory of disinfection-Chlorination and other Disinfection methods, Softening of Water, Removal of color and odors.	**Hours – 10**
Unit – 4 Sewage	
Sewage- Domestic and Storm water, Quantity of Sewage, Sewage flow variations. Conveyance of sewage- Sewers, shapes design parameters, operation and maintenance of sewers, Sewage pumping; Sewerage, Sewer appurtenances, Design of sewerage systems. Storm Water- Quantification and design of Storm water; Sewage and Sullage, Pollution due to improper disposal of sewage, National River cleaning plans, recycling of sewage – quality requirements for various purposes.	**Hours – 10**
Unit – 5 Building Plumbing and Distribution of Water:	

Plumbing Systems of Drainage – Sanitary Fittings and other Accessories – Single Stack System – One Pipe and Two Pipe Systems, various kinds of fixtures and valves used. **Distribution of Water:** Requirements- Methods of Distribution system, Layouts of Distribution networks. Analysis of Distribution networks: Hardy Cross and equivalent pipe methods.	**Hours –10**
Course outcomes: On successful completion of this course, students are able 1. Identify the water source and select proper intake structure 2. Estimate the demand of water. 3. Selection of suitable treatment for raw water treatments 4. Select the appropriate appurtenances in the water supply 5. Analyze the suitability of water distribution methods in various regions.	
Text Books: 1. The elements of environmental Engineering Elements K. N. Duggal, S. Chand & Company Ltd., New Delhi 2012. 2. Industrial Water and Wastewater Management, K.V.S.G. Murali Krishna Paramount Publications, Visakhapatnam in 2018. 3. Environmental Engineering, D. Srinivasan, PHI Learning Private Limited, New Delhi, 2011. 4. WHO Drinking water specifications. https://cpcb.nic.in/who-guidelines-for-drinking-water-quality/ 5. Water Quality Standards Updated On : 23 Oct 2019. 1. Water Quality Criteria ...***BIS-Drinking Water Specifications (IS: 10500-2012***). https://cpcb.nic.in/wqm/BIS_Drinking_Water_Specification.pdf	
Reference Books: 1. Rural Municipal and Industrial water management, K.V.S.G. Murali Krishna, Environmental Protection Society, Kakinada 2021. 2. Environmental Engineering, Ruth F. Weiner and Robin Matthews – 4th Edition Elsevier, 2003	
Online resources: https://nptel.ac.in/courses/103107084	

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Unit -1: Introduction	**Hours**
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	**08**
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**08**
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	**12**
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	**12**

genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms**. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

GROUNDWATER DEVELOPMENT AND MANAGEMENT SEMESTER- VII			
Subject Code	**21CECEP701b**	Internal Marks	30
No. of Lecture Hours/Week	03	Exam. Marks	70
Total Number of Lecture Hours	50	Exam. Hours	03
Credits-03			

Course Learning Objectives

This course will enable students to:

1. Recognize groundwater as an important natural resource.
2. Understand flow towards wells in confined and unconfined aquifers.
3. Understand the principles involved in the design and construction of wells.
4. Create awareness on improving the groundwater potential using various recharge techniques.
5. Know the importance of saline water intrusion in coastal aquifers and its control measures.
6. Understand groundwater modelling.

Unit-1	
Introduction: Groundwater in the hydrologic cycle, origin of groundwater, groundwater occurrence, vertical distribution of groundwater, zone of aeration and zone of saturation, geologic formation as Aquifers, types of aquifers, aquifer parameters, porosity, Specific yield and Specific retention, Permeability, Darcy's law, storage coefficient, Transmissivity, the differential equation governing groundwater flow in the three-dimensional derivation. **Well Hydraulics** Steady groundwater flow towards a well in confined and unconfined aquifers – Dupit's and Theism's equations, Assumptions, Formation constants, and the yield of an open well.	**10 Hours**
Unit-2	
Well Design Water wells, Open well, Advantages and disadvantages of open wells, Tube well, Advantages and disadvantages of tube wells, Types of wells, Screen well, Cavity well, Water well design-well diameter, well depth, Design of well screen-screen length, slot size, screen diameter and screen selection, screen material, Design of gravel pack, design criteria, Design of collector wells, Infiltration gallery, Yield of infiltration gallery.	**10 Hours**
Unit-3	
Well Construction and Development Drilling methods-rotary drilling, percussion drilling, well construction-installation of well screens-pull-back method, open-hole, bail-down and wash-down methods, well development-mechanical surging using compressed air, high velocity jetting of water, over pumping and back washing; well completion, well disinfection, well maintenance.	**10 Hours**
Unit-4	
Artificial Recharge Concept of artificial recharge of groundwater, recharge methods-basin, stream-channel, ditch and furrow, flooding and recharge well methods, recharge mounds and induced recharge, recharge through open channels and reservoirs. Saline Water Intrusion Occurrence of saline water intrusion, Ghyben- Herzberg relation, Shape of the interface, control of saline water intrusion.	**10 Hours**

Unit-5	
Ground Water Modeling and Management Introduction to Ground Water Modeling, Basic Principles of Ground Water Modeling, Types of Ground Water Models-Conceptual, Physical, Analogue, and Mathematical Models, Modeling process, Concepts of groundwater management.	**10 Hours**
Course outcomes: On successful completion of this course, students will be able to 1. Estimate aquifer parameters and yield of wells and Analyse radial flow towards wells in confined and unconfined aquifers. 2. Understanding well-design specifications 3. Understand well construction practices. 4. Determine the process of artificial recharge for increasing groundwater potential and understanding saline water intrusion in coastal aquifers and its control measures 5. Understanding groundwater models and applying appropriate measures for groundwater management.	
Text. Books 1. 'Groundwater' by Raghunath H M, New Age International Publishers, 2021. 2. 'Groundwater Hydrology 'by Todd D.K., Wiley India Pvt Ltd., 2021.	
REFERENCES: 1.'Groundwater Assessment and Management by Karanth K R, Tata McGraw Hill Publishing Co., 2017. 2.'Groundwater Hydrology by V. C. Agarwal, PHI Learning, 2010.	
Online: 1. https://archive.nptel.ac.in/courses/105/101/105101214/ 2. https://onlinecourses.nptel.ac.in/noc22_ce92/preview 3. https://archive.nptel.ac.in/courses/105/105/105105042/	

GREEN BUILDINGS			
Subject Code	21xxCEOxxxx	Internal Marks	30
Number of Lecture Hours/Week	3	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits –03			

Course Objectives:
Enable the students to

1. Know the green building and green energy building materials.
2. Familiarize with different rating agencies and features of green buildings.
3. Understand the term sustainability and sustainable development.
4. Learn sources of greenhouse gases and its impact on climate.
5. Understand and Plan land use confirming to zonal regulations

Unit -1	**Hours**
INTRODUCTION What is Green Building, Why to go for Green Building, Benefits of Green Buildings, Green Building Materials and Equipment in India, What are key Requisites for Constructing a Green Building, Important Sustainable features for Green Building	**10**
Unit -2	
GREEN BUILDING CONCEPTS AND PRACTICES Indian Green Building Council, Green Building Moment in India, Benefits Experienced in Green Buildings, Launch of Green Building Rating Systems, Residential Sector, Market Transformation; Green Building Opportunities And Benefits: Opportunities of Green Building, Green Building Features, Material and Resources, Water Efficiency, Optimum Energy Efficiency, Typical Energy Saving Approach in Buildings, LEED India Rating System and Energy Efficiency,	**10**
Unit – 3	
SUSTAINABILITY Introduction, Human development index, Sustainable development and social ethics, definitions of sustainability, populations and consumptions	**10**
Unit – 4	
THE CARBON CYCLE AND ENERGY BALANCES Introduction, Climate science history, carbon sources and emissions, The carbon cycle, carbon flow pathways, and repositories, Global energy balance, Global energy balance and temperature model, Greenhouse gases and Effects, Climate change projections and impacts	**10**
Unit-5	
SUSTAINABILITY AND BUILT ENVIRONMENT Introduction, Land use and land cover change, Land use planning and its role in sustainable development-Zoning and land use planning, smart growth, Environmentally sensitive design- low impact development, green infrastructure and conservation design, Green buildings and land use planning, Energy use and buildings	**10**

Course outcomes:
On completion of this course, students are able to:

1. Describe green buildings and green building materials.
2. Acquaint with different rating agencies and energy features of green buildings.
3. Understand the term sustainability and sustainable development.
4. Recognize sources of greenhouse gases emissions and its impact on climate.
5. Plan land use confirming to zonal regulations.

TEXT BOOKS

1. Standard for the Design of High-Performance Green Buildings by ASHRAE, 2014.
2. Engineering Applications in Sustainable Design and Development By Bradley A.Striebig, Adebayo A.Ogundipe and Maria Papadakis. First edition, 2016, CENGAGE Learning.

REFERENCES

1. Handbook on Green Practices published by Indian Society of Heating Refrigerating and Air conditioning Engineers, 2009.
2. Green Building Hand Book by Tomwoolley and Samkimings, 2009.
3. IGBC - Smart Cities & Green Building Concept in India

MANAGEMENT SCIENCE (Common to all Branches)			
Subject Code	-	**IA Marks**	30
Number of Lecture Hours/Week	3	**Exam Marks**	70
Total Number of Lecture Hours	50	**Exam Hours**	03
Credits – 03			

Course objectives:

1. To understand the concept of Management its nature importance, Management theories, concept of decision making and organization principles and structures.
2. To understand the concept of production management in the organization. Work study, SQC, inventory management and its techniques.
3. To understand the concept of HRM and its functions, Marketing Management, Strategic management its components.
4. To understand the concept of project management PERT, CPM and Project Crashing.
5. To understand the concepts of recent trends in management

Unit -I: Introduction to Management	**Hours**
Concept –nature and importance of Management – Functions of Management – Evaluation of Management thought- Theories of Motivation – Decision making process-Designing organization structure- Principles of organization - Types of organization structure.	**10 Hours**
Unit -II: Operations Management	
Nature & Objectives of OM-Production Methods-Plant Location & Layout Study & its significance – Work study- Statistical Quality Control- Control charts (P-chart, R-chart, and C chart). Simple problems- Material Management: Need for Inventory control- EOQ, ABC analysis (simple problems) and Types of ABC analysis (HML, SDE, VED, and FSN analysis).	**10 Hours**
Unit-III: Functional Management & Strategic Management	
Functional Management: Concept of HRM, HRD and PMIR- Functions of HRM - Marketing Management- Functions of Marketing, Marketing strategies based on product Life Cycle, Channels of distributions. **Strategic Management**: Vision, Mission, Goals, Strategy – Elements of Corporate Planning Process – Environmental Scanning – SWOT analysis- Steps in Strategy Formulation and Implementation, Generic Strategy alternatives	**10 Hours**
Unit –IV: Project Management: (PERT/CPM)	
Development of Network – Difference between PERT and CPM Identifying Critical Path- Probability- Project Crashing (Simple Problems).	**10 Hours**
Unit-V: Contemporary Management Practices	
Basic concepts of MIS, MRP, Justin- Time (JIT) system, Total Quality Management (TQM), Six sigma , Supply Chain Management, Enterprise Resource Planning (ERP), Business Process outsourcing (BPO), Business process Re-engineering and Bench Marking, Balanced Score Card.	**10 Hours**

Course outcomes:

1. Students are able to understand the concept and functions of Management, and Theories of Motivation, Styles of Leadership.
2. Students are able to understand the Statistical Quality Control Techniques, Methods of inspection, the concept of Inventory Management and Control.

3. Students are understand the functional areas of organization i.e., Marketing Management, Human Resource Management, and Strategic Management
4. Students are able to understand Project Management Techniques.
5. Students are able to Understand the various contemporary issues in Management Practices like TQM and BPO etc.

Question paper pattern:

Section A:

1. This section contains ten one or two line answer question carrying 1 mark each.
2. Two questions from each unit should present.

Section B:

1. This Section will have 10 questions.
2. Each full question carry 12 marks.
3. Each full question will have sub question covering all topics under a unit.

The student will have to answer 5 full questions selecting one full question from each unit.

Text Books:

1. 1. Dr. P. Vijaya Kumar & Dr. N. Appa Rao, '*Management Science*' Cengage, Delhi, 2012.
2. Dr. A. R. Aryasri, *Management Science* ' TMH 2011.

Reference Books:

1. Koontz & Weihrich: 'Essentials of Management' TMH 2011
2. Seth & Rastogi: Global Management Systems, Cengage Learning, Delhi, 2011.
3. Robbins: Organizational Behaviors, Pearson Publications, 2011
4. Kanishka Bedi: Production & Operational Management, Oxford Publications, 2011.
5. Manjunath: Management Science, Pearson Publications, 2013.
6. Biswajit Patnaik: Human Resource Management, PHI, 2011.
7. Hitt and Vijaya Kumar: Strategic Management, Cengage Learning.

ENVIRONMENTAL SCIENCE			
Subject Code	21CMESN1090/2090	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Acquire knowledge on global environmental challenges.
2. Learn different types of natural resources
3. Create awareness on biodiversity and ecology.
4. Gain scientific knowledge on environmental pollution
5. Acquire knowledge on water conservation methods and environmental legislation

Module -1	**Hours**
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment -** Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Role of Information Technology in Environment and human health.	**6**
Module -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Floods, drought, , dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: Effects of modern agriculture - fertilizer-pesticide problems, water logging, eutrophication, biological magnification and salinity. Energy resources: Renewable and non-renewable energy resources Role of an individual in conservation of natural resources.	**6**
Module – 3	
ECOSYSTEM AND BIODIVERSITY **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the Forest and grassland ecosystem. **Biodiversity** - Introduction - Definition: genetic, species and ecosystem diversity. – Value of biodiversity: consumptive use, productive use, social, ethical and optional values - Hot-spots ofbiodiversity - Threats to biodiversity:	**8**

habitat loss - Endangered andendemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
Module – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Noise pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution.	**6**
Module – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act - Forest Conservation Act .	**6**

TEXT BOOKS / REFERENCE BOOKS:	
T1	E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
T2	J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi.
T3	G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi
R1	Text Book of Environmental Studies by Deeksha Dave & P. Udaya Bhaskar, Cengage Learning. .
R2	Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada
R3	Environmental Studies, P.N. Palaniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

COURSE OUTCOMES: On completion of the course student will be able to	
CO1	Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion.
CO2	Preserve several natural resources
CO3	Summarize the concept of ecosystem
CO4	Control different types of pollution
CO5	Understand social issues and environmental legislation

DISASTER MANAGEMENT SEMESTER – V			
Subject Code	**21CECEN5090**	Internal Marks	30
Number of Lecture Hours/Week	2	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – NA			

Course Objectives:

This course will enable students to:

1. Develop an understanding of why and how the modern disaster manager is involved with pre-disaster and post-disaster activities.
2. Develop an awareness of the chronological phases of natural disaster response and refugee relief operations. Understand how the phases of each are parallel and how they differ.
3. Understand the 'relief system' and the 'disaster victim.
4. Describe the three planning strategies useful in mitigation.
5. Identify the regulatory controls used in hazard management. Describe public awareness and economic incentive possibilities

Unit -1 Natural Hazards and Disaster Management	
Introduction of DM – Inter Disciplinary -nature of the subject– Disaster Management cycle – Five priorities for action. Case study methods of the following: floods, draughts – Earthquakes – global warming, cyclones & Tsunamis – Post Tsunami hazards along the Indian coast – landslides.	**Hours – 10**
Unit -2 Man made Disaster and their Management along with Case Study	
Fire hazards – transport hazard dynamics– solid waste management – post disaster – bio terrorism -threat in mega cities, rail and air craft's accidents, and Emerging infectious diseases & Aids and their management.	**Hours – 10**
Unit – 3 Risk and Vulnerability	
Building codes and land use planning – social vulnerability – environmental vulnerability – Macroeconomic management and sustainable development, climate change risk rendition – financial management of disaster – related losses	**Hours – 10**
Unit – 4 Role of Technology in Disaster Managements:	
Disaster management for infra structures, taxonomy of infra structure – treatment plants and process facilities- electrical substations- roads and bridges- mitigation programme for earth quakes –flowchart, geospatial information in agriculture drought assessment-multimedia technology in disaster risk management and training- transformable indigenous knowledge in disaster reduction.	**Hours – 10**
Unit-5 Education and Community Preparedness:	
Education in disaster risk reduction-Essentials of school disaster education-Community capacity and disaster resilience-Community based disaster	**Hours –10**

recovery -Community based disaster management and social capital- Designing resilience- building community capacity for action.	

Course outcomes:

On completion of this course, students are able to

1. Affirm the usefulness of integrating management principles in disaster mitigation work
2. Distinguish between the different approaches needed to manage pre- during and post-disaster periods
3. Explain the process of risk management
4. Relate to risk transfer
5. Prepare community for risk reduction

Text Books:

1. Disaster Management – Global Challenges and Local Solutions by Rajib shah & R Krishnamurthy (2009), Universities press.
2. Disaster Science & Management' by Tushar Bhattacharya, 2012 Tata McGraw Hill Education Pvt. Ltd., New Delhi.
3. Singh B.K., 2008, Handbook of Disaster Management: Techniques & Guidelines, Rajat Publication

Reference Books:

1. Disaster Management – Future Challenges and Opportunities' by Jagbir Singh (2007), I K International Publishing House Pvt. Ltd.
2. Ghosh G.K., 2006, Disaster Management, APH Publishing Corporation

Online resources:

1. http://ndma.gov.in/ (Home page of National Disaster Management Authority)

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EEE

COURSE STRUCTURE AND DETAILED SYLLABUS

SITE 21 REGULATIONS

For

B.Tech.

Electrical and Electronics Engineering

With effective from the Academic Year

2021-22

Course Structure for I B. Tech I Semester Under the Regulations of SITE-21

Common for (CE, EEE, ME, ECT, CST, AI & ML)
I SEMESER

S. No	Course Category	Course code	Course Title	L	T	P	C
1	BS	21CMMAT1010	Engineering Mathematics – I(Calculus and Differential Equations)	3	0	0	3
2	BS	21EEPHT1020	Engineering Physics	3	0	0	3
3	BS	21CMCHT1030	Engineering Chemistry	3	0	0	3
4	ES	21CMCST1040	Programming for Problem Solving	3	0	0	3
5	ES	21CMMEL1050	Engineering Graphics	2	0	2	3
6	BS LAB	21EEPHL1060	Engineering Physics Lab	0	0	3	1.5
7	BS LAB	21CMCHL1070	Engineering Chemistry Lab	0	0	3	1.5
8	ES LAB	21CMCSL1080	Programming for Problem Solving Lab	0	0	3	1.5
9	MC	21CMMSN1090	Constitution of India, Professional Ethics & Human Rights	2	0	0	0
TOTAL				**16**	**0**	**11**	**19.5**

Course Structure for I B. Tech II Semester Under the Regulations of SITE-21

Common for (CE, EEE, ME, ECT, CST, AI & ML)
I I SEMESER

S. No	Course Category	Course code	Course Title	L	T	P	C
1	HS	21CMEGT2010	Technical English	3	0	0	3
2	BS	21CMMAT2020	Engineering Mathematics – II(Linear algebra, Laplace Transforms and Numerical Methods)	3	0	0	3
3	ES	21CMEET2030	**Basic Electrical Engineering**	3	0	0	3
4	ES	21CMCST2040	Python Programming	1	0	4	3
5	ES	21EEMET2050	Engineering Mechanics	3	0	0	3
6	HS LAB	21CMEGL2060	English Communication Skills Lab	0	0	3	1.5
7	ES LAB	21CMEEL2070	**Basic Electrical Engineering Lab**	0	0	3	1.5
8	ES LAB	21CMMEL2080	Engineering Workshop Lab	0	0	3	1.5
9	MC	21CMCHN2090	Environmental Science	2	0	0	0
			TOTAL	**15**	**0**	**13**	**19.5**

Course Structure for II B. Tech I Semester Under the Regulations of SITE-21							
III SEMESTER							
S. No	Course Category	**Course Code**	**Course Title**	**L**	**T**	**P**	**C**
1	BS	21EEMAT3010	Engineering Mathematics III (Vector Calculus and Complex Analysis)	3	0	0	3
2	PC	21EEEET3020	Electrical Circuits Analysis	3	0	0	3
3	PC	21EEEET3030	Analog Electronics	3	0	0	3
4	PC	21EEEET3040	Electrical Measurements & Instrumentation	3	0	0	3
5	PC	21EEEET3050	DC Machines & Transformers	3	0	0	3
6	PC LAB	21EEEEL3060	Analog Electronics Lab	0	0	3	1.5
7	PC LAB	21EEEEL3070	Electrical Circuit Analysis Lab	0	0	3	1.5
8	PC LAB	21EEEEL3080	DC Machines & Transformers Lab	0	0	3	1.5
9	SOC	21EEEES3090	Electrical Wiring & Installation	1	0	2	2
10	MC	21EEEEN3100	Electromagnetic Fields	2	0	0	0
			TOTAL	**18**	**0**	**11**	**21.5**

Course Structure for II B. Tech II Semester Under the Regulations of SITE-21							
IV SEMESTER							
S. No	**Course Category**	**Course Code**	**Course Title**	**L**	**T**	**P**	**C**
1	ES	21EEEET4010	Signals & Systems	3	0	0	3
2	PC	21EEEET4020	Digital Electronics	3	0	0	3
3	BS	21CMMAT4030	Engineering Mathematics-IV (Probability & Statistics)	3	0	0	3
4	PC	21EEEET4040	Induction & Synchronous Machines	3	0	0	3
5	HSS	21CMMST4050	Engineering Economics And Financial Management	3	0	0	3
6	PC LAB	21EEEEL4060	Digital Electronics Lab	0	0	3	1.5
7	PC LAB	21EEEEL4070	Electrical Measurements & Instrumentation Lab	0	0	3	1.5
8	PC LAB	21EEEEL4080	Induction & Synchronous Machines Lab	0	0	3	1.5
9	SOC	21EEEES4090	Design of Electrical Circuits using Engineering software tools	1	0	2	2
			TOTAL	**16**	**0**	**11**	**21.5**
10	H/M		Honor/Minor courses(The hours distribution can be 3-0-2 or 3-1-0)	4	0	0	4

Course Structure for III B. Tech I Semester Under the Regulations of SITE-21							
V SEMESTER							
S. No	**Course Category**	**Course Code**	**Course Title**	**L**	**T**	**P**	**C**
1	PC	21EEEET5010	Power Generation, Transmission & Distribution	3	0	0	3
2	PC	21EEEET5020	Power Electronics	3	0	0	3
3	PC	21EEEET5030	Control Systems	3	0	0	3
4	OE	21EEXXO504X	Open Elective-I	2	0	2	3
5	PE	21EEEEP505X	Professional Elective-I	3	0	0	3
6	PC LAB	21EEEEL5060	Power Systems Lab	0	0	3	1.5
7	PC LAB	21EEEEL5070	Power Electronics Lab	0	0	3	1.5
8	SAC/SC	21CMAHSx0x	Soft Skills & Aptitude Builder - 1	1	0	2	2
9	MC	21EEEEN5090	Energy studies	2	0	0	0
10	SI	21EEEEI5010	Summer Internship (1-2 months) after second year to evaluate in V semester	0	0	0	1.5
			TOTAL	**17**	**0**	**10**	**21.5**
11	H/M		Honor/Minor courses(The hours distribution can be 3-0-2 or 3-1-0)	4	0	0	4

Professional Elective – I

S. No	Course Code	Course Title	L	T	P	C
1	21EEEEP505A	Special Electrical Machines.	3	0	0	3
2	21EEEEP505B	Electrical Energy conservation & Auditing.	3	0	0	3
3	21EEEEP505C	Digital signal Processing	3	0	0	3

Course Structure for III B. Tech II Semester Under the Regulations of SITE-21							
VI SEMESR							
S. No	**Course Category**	**Course Code**	**Course Title**	**L**	**T**	**P**	**C**
1	PC	21EEEET6010	Power System Analysis, Operation & Control	3	0	0	3
2	PC	21EEEET6020	Microprocessors & Microcontrollers	3	0	0	3
3	PC	21EEEET6030	Power Semiconductor Drives	3	0	0	3
4	PE	21EEEEP604X	Professional Elective-II	3	0	0	3
5	OE	21EEXXO605X	Open Elective -II	2	0	2	3
6	PC	21EEEEL6040	Microprocessors & Microcontrollers Laboratory	0	0	3	1.5
7	PC LAB	21EEEEL6050	Control Systems Lab	0	0	3	1.5
8	PC LAB	21EEEEL6060	Power Systems Analysis Lab	0	0	3	1.5
9	SAC/SC	21CMAHSx0x	Soft Skills & Aptitude Builder - 2	0	0	0	2
10	I/RI	Industrial/Research Internship(Mandatory) 1-2 Months(No credits)					
			TOTAL	**14**	**0**	**11**	**21.5**
11	H/M		Honor/Minor courses(The hours distribution can be 3-0-2 or 3-1-0)	4	0	0	4

Professional Elective-II

S. No	Course Code	Course Title	L	T	P	C

1	21EEEEP604A	Electrical Machine Modeling & Analysis	3	0	0	3
2	21EEEEP604B	Power system Protection.	3	0	0	3
3	21EEEEP604C	Control system design.	3	0	0	3

Course Structure for IV B. Tech I Semester Under the Regulations of SITE-21							
VII SEMESTER							
S. No	**Course Category**	**Course Code**	**Course Title**	**L**	**T**	**P**	**C**
1	PE	21EEEEP701X	Professional Elective-III	3	0	0	3
2	PE	21EEEEP702X	Professional Elective -IV	3	0	0	3
3	PE	21EEEEP703X	Professional Elective -V	3	0	0	3
4	OE	21EEXXO704X	Open Elective –III	2	0	2	3
5	OE	21EEXXO805X	Open Elective –IV	2	0	2	3
6	H&SS	21EEEEOX0XX	Elective	3	0	0	3
7	SAC/SC	21EEEES7010	Design of Photovoltaic Systems	1	0	2	2
8	SI	21EEEEI7020	Industrial/Research Internship (1-2 Months) after third year to be evaluated in VII semester	0	0	0	3
TOTAL				**17**	**0**	**6**	**23**
9	H/M		Honor/Minor courses(The hours distribution can be 3-0-2 or 3-1-0)	4	0	0	4

Professional Elective-III

S.No.	Course Code	Course Title	L	T	P	C
1	21EEEEP701A	Switched Mode Power Converters	3	0	0	3
2	21EEEEP701B	Electrical & Hybrid Vehicles	3	0	0	3
3	21EEEEP701C	Artificial Intelligence Techniques	3	0	0	3

Professional Elective-IV

S.No.	Course Code	Course Title	L	T	P	C
1	21EEEEP702A	Wind & Solar Energy Systems	3	0	0	3
2	21EEEEP702B	Power Quality	3	0	0	3
3	21EEEEP702C	Digital Control Systems	3	0	0	3

Professional Elective-V

S.No.	Course Code	Course Title	L	T	P	C
1	21EEEEP703A	FACTS & HVDC Transmission Systems	3	0	0	3
2	21EEEEP703B	Smart Grid	3	0	0	3
3	21EEEEP703C	Optimization Techniques	3	0	0	3

Course Structure for IV B. Tech II Semester Under the Regulations of SITE-21							
VIII SEMESTER							
S.No.	**Course Category**	**Course Code**	**Course Title**	**L**	**P**	**T**	**C**

1	Project	21EEEER8010	Project, Seminar and Internship in Industry (6 months)	0	14	0	12
		Total		0	14	0	12

Open Electives offered by EEE department

S.No.	Course Code	Subject title	L	T	P	C
1	21XXEEOM0XA	Control system design	3	0	0	3
2	21XXEEOM0XB	Digital Control Systems	3	0	0	3
3	21XXEEOM0XC	Intelligent control & its applications	3	0	0	3
4	21XXEEOM0XD	Digital Signal Processing	3	0	0	3
5	21XXEEOM0XE	Electrical & Hybrid Vehicles	3	0	0	3
6	21XXEEOM0XF	Industrial Electrical Systems	3	0	0	3
7	21XXEEOM0XG	Electrical materials	3	0	0	3
8	21XXEEOM0XH	Optimization techniques	3	0	0	3
9	21XXEEOM0XI	Wind & Solar Energy Systems	3	0	0	3

Mandatory Courses

S.No.	Course Code	Subject title	L	T	P	C
1	21CMMSN1090	Constitution of India, ProfessionalEthics & Human Rights	2	0	0	0
2	21CMCHN2090	Environmental Science	2	0	0	0
3	21EEEEN3100	Electromagnetic Fields	2	0	0	0
4	21EEEEN5090	Energy studies	2	0	0	0

Skill oriented Courses

S.No.	Course Code	Subject title	L	T	P	C
1	21EEEES3090	Electrical Wiring & Installation	1	0	2	2
2	21EEEES4090	Design of Electrical Circuits using Engineering Software Tools	1	0	2	2
3	21CMAHSx0x	Soft Skills & Aptitude Builder - 1	1	0	2	2
4	21CMAHSx0x	Soft Skills & Aptitude Builder - 2	1	0	2	2
5	21EEEES7010	Design of Photovoltaic Systems	1	0	2	2

Course structure for Electrical & Electronics Engineering Honors (for EEE Students)

II B. Tech II Semester:

S. No	Subject code	Name of the Subject	L	T	P	C
1	21EEEEH410A	Electrical Wiring, Estimation and Costing	3	1	0	4
2	21EEEEH410B	SCADA Energy Management Systems	3	1	0	4
3	21EEEEH410C	Linear IC Applications	3	1	0	4
4	21EEEEH410D	Renewable Energy Systems	3	1	0	4

III B. Tech I Semester:

S. No	Subject code	Name of the Subject	L	T	P	C
1	21EEEEH511A	Electrical Machine Design	3	1	0	4
2	21EEEEH511B	Utilization of Electrical Energy & Traction	3	1	0	4
3	21EEEEH511C	Solar & Advanced Energy Storage System	3	1	0	4
4	21EEEEH511D	Modern Control Systems	3	1	0	4

III B. Tech II Semester:

S. No	Subject code	Name of the Subject	L	T	P	C
1	21EEEEH611A	Modern Power Electronics	3	1	0	4
2	21EEEEH611B	AC Drives	3	1	0	4
3	21EEEEH611C	Power Quality & Custom Power Devices	3	1	0	4
4	21EEEEH611D	High Voltage Engineering	3	1	0	4

IV B. Tech I Semester:

S. No	Subject code	Name of the Subject	L	T	P	C
1	21EEEEH709A	EHV AC Transmission	3	1	0	4
2	21EEEEH709B	Line Commutated & Active Rectifiers	3	1	0	4
3	21EEEEH709C	Electrical Distribution Systems	3	1	0	4
4	21EEEEH709D	Power Systems Dynamics & Stability	3	1	0	4

Course structure for Electrical & Electronics Engineering
Minors to other Departments

II B. Tech II Semester:

S. No	Subject code	Name of the Subject	L	T	P	C
1	21XXEEM410A	Fundamental of Electrical Circuit Theory	3	1	0	4
2	21XXEEM410B	Fundamental of EMF Theory	3	1	0	4
3	21XXEEM410C	Fundamental of Control Systems	3	1	0	4

III B. Tech I Semester:

S. No	Subject code	Name of the Subject	L	T	P	C
1	21XXEEM511A	Fundamentals of Electrical Machines	3	1	0	4
2	21XXEEM511B	Fundamentals of Power Electronics	3	1	0	4
3	21XXEEM511C	Fundamental of Electrical Measurements & Instrumentation	3	1	0	4

III B. Tech II Semester:

S. No	Subject code	Name of the Subject	L	T	P	C
1	21XXEEM611A	Fundamentals of Electrical Power Generation & Economic Concepts	3	1	0	4
2	21XXEEM611B	Fundamentals of Renewable Energy Sources	3	1	0	4
3	21XXEEM611C	Fundamentals of Energy Storage Systems	3	1	0	4

IV B. Tech I Semester:

S. No	Subject code	Name of the Subject	L	T	P	C
1	21XXEEM709A	Fundamentals of Electrical Power Transmission & Distribution	3	1	0	4
2	21XXEEM709B	Fundamentals of Utilization of Electrical Energy	3	1	0	4
3	21XXEEM709C	Fundamentals of Electrical Safety	3	1	0	4

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS (Common to all Branches)			
Subject Code	21CMMST2090	IA Marks	30
Number of Lecture Hours/Week	03	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit - I	
Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**10**
Unit - II	
Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**10**
Unit – III	
State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**10**
Unit –IV	
Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	**10**
Unit – V	
Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**10**

TEXT BOOKS / REFERENCE BOOKS

T1	Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn., 2001
T2	Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.
T3	M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.

R1	M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
R2	Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
R3	Latest Publications of Indian Institute of Human Rights, New Delhi

COURSE OUTCOMES: On completion of the course student will	
CO1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
CO2	Understand state and central policies, fundamental duties.
CO3	Understand Electoral Process, special provisions.
CO4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
CO5	Understand Engineering ethics and responsibilities of Engineers
CO6	Understand Engineering Integrity & Reliability

ENVIRONMENTAL SCIENCE			
Subject Code	21CMCHN1090/2090	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Acquire knowledge on global environmental challenges.
2. Learn different types of natural resources
3. Create awareness on biodiversity and ecology.
4. Gain scientific knowledge on environmental pollution
5. Acquire knowledge on water conservation methods and environmental legislation

Module -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Role of Information Technology in Environment and human health.	**Hours – 6**
Module -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Floods, drought, , dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: Effects of modern agriculture - fertilizer-pesticide problems, water logging, eutrophication, biological magnification and salinity. Energy resources: Renewable and non-renewable energy resources Role of an individual in conservation of natural resources.	**Hours –6**
Module – 3	
ECOSYSTEM AND BIODIVERSITY **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the Forest and grassland ecosystem. **Biodiversity** - Introduction - Definition: genetic, species and ecosystem diversity. – Value of biodiversity: consumptive use, productive use, social, ethical and optional values - Hot-spots of	**Hours –8**

biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
Module – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Noise pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution.	**Hours –6**
Module – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act .	**Hours –6**
COURSE OUTCOMES: On completion of the course student will be able to 1. Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion. 2. Preserve several natural resources 3. Summarize the concept of ecosystem 4. Control different types of pollution 5. Understand social issues and environmental legislation	
QUESTION PAPER PATTERN: 1. Question paper consists of 10 questions. 2. Each full question carrying 14 marks. 3. Each full question will have sub question covering all topics under a unit. 4. The student will have to answer 5 full questions selecting one full question from each unit.	
TEXT BOOKS: 1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi. 2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi. 3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi	

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeksha Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. Environmental Studies, P.N. Palaniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

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ME

COURSE STRUCTUREAND SYLLABUS SITE-21 REGULATIONS

For
B.Tech
Mechanical Engineering

With effective from the Academic Year 2023-24

sasi INSTITUTE OF TECHNOLOGY & ENGINEERING
autonomous
...Values We Live...
Accredited by **NAAC** with **"A"** Grade
Recognised by **UGC** under section 2(f) &12(B)
Approved by **AICTE** - NEW Delhi
Permanently Affiliated to **JNTUK, SBTET**
Ranked as **"A" Grade** by Govt. of A.P.
Department of Mechanical Engineering

I B. Tech. I Semester Proposed Course Structure for the Regulation SITE 21

S.No	CC	Course code	Course Title	L	T	P	C
1	BSC	21CMMAT1010	Engineering Mathematics – I (Calculus and Differential Equations)	3	0	0	3
2	BSC	21EEPHT1020	Engineering Physics	3	0	0	3
3	BSC	21CMCHT1030	Engineering Chemistry	3	0	0	3
4	ESC	21CMCST1040	Programming for Problem Solving	3	0	0	3
5	ESC	21CMMEL1050	Engineering Graphics	2	0	2	3
6	BSC	21EEPHL1060	Engineering Physics Lab	0	0	3	1.5
7	BSC	21CMCHL1070	Engineering Chemistry Lab	0	0	3	1.5
8	ESC	21CMCSL1080	Programming for Problem Solving Lab	0	0	3	1.5
9	MC	21CMMSN1090	Constitution of India, Professional Ethics & Human Rights	2	0	0	0
TOTAL				**16**	**0**	**11**	**19.5**

I B. Tech. II Semester Proposed Course Structure for the Regulation SITE 21

S. No	CC	Course code	Course Title	L	T	P	C
1	HSC	21CMEGT2010	Technical English	3	0	0	3
2	BSC	21CMMAT2020	Engineering Mathematics – II (Linear algebra, Laplace Transforms and Numerical Methods)	3	0	0	3
3	ESC	21CMEET2030	**Basic Electrical Engineering**	3	0	0	3
4	ESC	21CMCST2040	Python Programming	1	0	4	3
5	ESC	21EEMET2050	Engineering Mechanics	3	0	0	3
6	HSC	21CMEGL2060	English Communication Skills Lab	0	0	3	1.5
7	ESC	21CMEEL2070	**Basic Electrical Engineering Lab**	0	0	3	1.5
8	ESC	21CMMEL2080	Engineering Workshop Lab	0	0	3	1.5
9	MC	21CMCHN2090	Environmental Science	2	0	0	0
			TOTAL	**15**	**0**	**13**	**19.5**

II B. Tech. III Semester Proposed Course Structure for the Regulation SITE 21

S.No.	CC	Course Code	Course Title	L	T	P	C
1	BSC	21CMMAT3010	Engineering Mathematics -III (Vector Calculus and Complex Analysis)	3	0	0	3
2	ESC	21MEMET3020	Materials Engineering	3	0	0	3
3	PCC	21MEMET3030	Mechanics of Solids	3	0	3	3
4	PCC	21MEMET3040	Thermodynamics	3	0	0	3
5	PCC	21MEMET3050	Fluid Mechanics and Fluid Machines	3	0	3	3
6	ESC	21MEMEL3060	Mechanics of Solids &Materials Lab	0	0	3	1.5
7	PCC	21MEMEL3070	Fluid Mechanics and Fluid Machine s Lab	0	0	3	1.5
8	SOC	21MEMES3080	Computer Aided Engineering Drawing and Drafting (CAEDP)	1	0	2	2
9	MC	21MEECN3090	Basic Electronics Engineering	3	0	0	0
						Total Credit	**20**

II B. Tech. IV Semester Proposed Course Structure for the Regulation SITE 21

S.No.	CC	Course Code	Course Title	L	T	P	Cr
1.	BSC	21 CMMAT 4010	Engineering Mathematics –IV (Fourier series, Applications of PDE and Probability & Statistics)	3	0	0	3
2.	PCC	21MEMET4020	Applied Thermodynamics	3	0	0	3
3.	PCC	21MEMET4030	Design of Machine Elements -I	3	0	0	3
4.	PCC	21MEMET4040	Production Technology	3	0	0	3
5.	PCC	21MEMET4050	Kinematics of Machinery	3	0	0	3
6.	HSC	21MEMST4060	Engineering Economics and Financial Management	3	0	0	3
7.	PCC	21MEMEL4070	Thermal Engineering Lab	0	0	3	1.5
8.	PCC	21MEMEL4080	Production Technology Lab	0	0	3	1.5
9.	SOC	21MEMES4090	Computer Aided Three-Dimensional Interactive Application (CATIA)	1	0	2	2
						Total credits	23
H/M			Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

III B. Tech. V Semester Course Structure for the Regulation SITE 21

S. No.	CC	Course Code	Course Title	L	T	P	Cr
1	PCC	21MEMET5010	Machine Tools and Metrology	3	0	0	3
2	PCC	21MEMET5020	Dynamics of Machinery	3	0	0	3
3	PCC	21MEMET5030	Design of Machine Elements-II	3	0	0	3
4	PEC	21MEMEP504X	Professional Elective-I	3	0	0	3
5	OEC	21MEXXO505X	Open Elective Course-I	3	0	0	3
6	PCC	21MEMEL5060	Machine Tools and Metrology Lab	0	0	3	1.5
7	PCC	21MEMEL5070	Theory of Machines Lab	0	0	3	1.5
8	SOC	21MEXXS5080	Soft Skills & Aptitude Builder - 1	1	0	2	2
9	MC	21MEMEM5090	Machine Drawing Practice Lab	0	0	3	0
10	SI	21MEMEI5100	Summer Internship (2 months) after II year to be evaluated during V semester	0	0	0	1.5
Total credits							**21.5**
11	H/M		Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

Professional Elective Course -I

S.No.	CC	Course Code	Course Title	L	T	P	Cr
1	PEC	21MEMEP504A	Conventional and Non Conventional Power Stations	3	0	0	3
2		21MEMEP504B	Nano Technology	3	0	0	3
3		21MEMEP504C	Industrial Robotics with Artificial Intelligence	3	0	0	3
NPTEL/SWAYAM/MOOCs (Course of 12 Weeks duration) to be offered							

III B. Tech. VI Semester Course Structure for the Regulation SITE 21

S.No.	CC	Course Code	Course Title	L	T	P	Cr
1	PCC	21MEMET6010	CAD/CAM/CIM	3	0	0	3
2	PCC	21MEMET6020	Finite Element Methods	3	0	0	3
3	PCC	21MEMET6030	Heat Transfer	3	0	0	3
4	PEC	21MEMEP604X	Professional Elective-II	3	0	0	3
5	OEC	21MEXXO605X	Open Elective Course-II	3	0	0	3
6	PCCL	21MEMEL6060	CAD/CAM Lab	0	0	3	1.5
7	PCCL	21MEMEL6070	Heat Transfer Lab	0	0	3	1.5
8	PCCL	21MEMEL6080	Instrumentation and Mechatronics Lab	0	0	3	1.5
9	SOC	21MEXXS6090	Soft Skills & Aptitude Builder - 2	1	0	2	2
10	MC	21MEMEN6100	Biology for Engineers	2	0	0	0
11	I/RI	Research Internship - 2 Months (Mandatory) after Third year (to be evaluated during VII semester					
Total Credits							**21.5**
12	H/M		Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

Professional Elective-II

S. No.	CC	Subject Code	Name of the subject	L	T	P	Cr
1	PEC	21MEMEP604A	Gas Dynamics and Jet Propulsion	3	0	0	3*

2		21MEMEP604B	Mechanical Vibrations	3	0	0	3*
3		21MEMEP604C	Instrumentation and Mechatronics	3	0	0	3*
NPTEL/SWAYAM/MOOCs (Course of 12 Weeks duration) to be offered							

IV B. Tech. VII Semester Course Structure for the Regulation SITE 21

S.No.	CC	Course Code	Course Title	L	T	P	Cr
1	PEC	21MEMEP701X	Professional Elective-III	3	0	0	3
2	PEC	21MEMEP702X	Professional Elective-IV	3	0	0	3
3	PEC	21MEMEP703X	Professional Elective-V	3	0	0	3
4	OEC	21MEXXO704X	Open Elective Course-III	3	0	0	3
5	OEC	21MEXXO705X	Open Elective Course-IV	3	0	0	3
6	HSC	21MEMET7060	Operation Research	3	0	0	3
7	SOC	21MEMES7070	Modelling and Analysis (FEA)	1	0	2	2
8	I/RI	21MEMER7080	Research Internship - 2 Months (Mandatory) after Third year (to be evaluated during VII semester	0	0	6	3
Total Credits							**23**
9	H/M		Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

Professional Elective Course -III

S.No.	CC	Course Code	Course Title	L	T	P	Cr
1	PEC	21MEMEP701A	Prime Movers for Automobiles	3	0	0	3
2		21MEMEP701B	Mechanics of Composites	3	0	0	3
3		21MEMEP701C	Non – Destructive Evaluation	3	0	0	3
NPTEL/SWAYAM/MOOCs (Course of 12 Weeks duration) to be offered							

Professional Elective Course -IV

S. No.	CC	Course Code	Course Title	L	T	P	Cr
1	PEC	21MEMEP702A	Refrigeration & Air Conditioning	3	0	0	3
2		21MEMEP702B	Synthesis and Characterization of Materials	3	0	0	3
3		21MEMEP702C	Smart Manufacturing and IIOT	3	0	0	3
NPTEL/SWAYAM/MOOCs (Course of 12 Weeks duration) to be offered							

Professional Elective Course -V

S. No.	CC	Course Code	Course Title	L	T	P	Cr
1	PEC	21MEMEP703A	Solar Energy Engineering and Applications	3	0	0	3
2		21MEMEP703B	Additive Manufacturing	3	0	0	3
3		21MEMEP703C	Production Planning and Control	3	0	0	3
NPTEL/SWAYAM/MOOCs (Course of 12 Weeks duration) to be offered							

IV B. Tech. II Semester Course Structure for the Regulation SITE 21

S. No.	CC	Course Code	Course Title	L	T	P	Cr
1	Project	21MEMER8010	Project, Seminar and Internship in Industry (6 months)	0	0	0	12
Total Credits							12

Comparison of suggested breakup of AICTE, APSCHE and SITE21Curriculum Credit Distribution for B.Tech. Mechanical Engineering Program

S.No.	Category	No. of Credits		
		Suggested by AICTE	APSCHE	Proposed SITE-21
1	Humanities and Social Sciences	9	10.5	10.5
2	Basic Science Courses	30	21	18
3	Engineering Science Courses	27	24	24
4	Professional Core Courses	50.5	51	54
5	Professional Elective Courses	18	15	15
6	Open Elective Courses	9	12	12
7	Project Work , Seminar and Internship	15	16.5	16.5
8	Skill oriented Courses	-	10	10
9	Mandatory Courses	-	-	-
Total Credits		160	160	160

Semester Wise Number of Credits of AICTE, APSCHE and SITE21Curriculum

SEMESTER	CREDITS			
	AICTE	APSCHE	JNTUK R20	SITE-21
I	17.5	19.5	19.5	19.5
II	20.5	19.5	19.5	19.5
III	23	21.5	21.5	20
IV	19	21.5	21.5	23
V	20.5	21.5	21.5	21.5
VI	21.5	21.5	21.5	21.5
VII	18.5	23	23	23
VIII	18	12	12	12
TOTAL	**160**	**160**	**160**	**160**

III B. Tech. VI Semester Course Structure for the Regulation SITE 21

S.No.	CC	Course Code	Course Title	L	T	P	Cr
1	PCC	21MEMET6010	CAD/CAM/CIM	3	0	0	3
2	PCC	21MEMET6020	Finite Element Methods	3	0	0	3
3	PCC	21MEMET6030	Heat Transfer	3	0	0	3
4	PEC	21MEMEP604X	Professional Elective-II	3	0	0	3
5	OEC	21MEXXO605X	Open Elective Course-II	3	0	0	3
6	PCCL	21MEMEL6060	CAD/CAM Lab	0	0	3	1.5
7	PCCL	21MEMEL6070	Heat Transfer Lab	0	0	3	1.5
8	PCCL	21MEMEL6080	Instrumentation and Mechatronics Lab	0	0	3	1.5
9	SOC	21MEXXS6090	Soft Skills & Aptitude Builder - 2	1	0	2	2
10	MC	21MEMEN6100	Biology for Engineers	2	0	0	0
11	I/RI	Research Internship - 2 Months (Mandatory) after Third year (to be evaluated during VII semester					
Total Credits							**21.5**
12	H/M		Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

Professional Elective-II

S. No.	CC	Subject Code	Name of the subject	L	T	P	Cr
1	PEC	21MEMEP604A	Gas Dynamics and Jet Propulsion	3	0	0	3*
2		21MEMEP604B	Mechanical Vibrations	3	0	0	3*
3		21MEMEP604C	Instrumentation and Mechatronics	3	0	0	3*
NPTEL/SWAYAM/MOOCs (Course of 12 Weeks duration) to be offered							

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS SEMESTER - I/I			
Subject Code	21CMMSN1090	IA Marks	30
Number of Lecture Hours/Week	03	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit - I	
Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours – 10**
Unit - II	
Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours – 10**
Unit – III	
State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**Hours – 10**
Unit –IV	
Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	**Hours – 10**
Unit – V	
Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours – 10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity & Reliability

QUESTION PAPER PATTERN:

1. It will have 5 questions with internal choice.
2. Each question carries 14 marks.
3. Each full question comprises sub questions covering all topics under a unit.

TEXT BOOKS:

1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn., 2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma, **"Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

ENVIRONMENTAL SCIENCE			
Subject Code	21CMCHN2090	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Acquire knowledge on global environmental challenges.
2. Learn different types of natural resources
3. Create awareness on biodiversity and ecology.
4. Gain scientific knowledge on environmental pollution
5. Acquire knowledge on water conservation methods and environmental legislation

Unit -1	**Hours**
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Role of Information Technology in Environment and human health.	6
Unit -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Floods, drought, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: Effects of modern agriculture - fertilizer-pesticide problems, water logging, eutrophication, biological magnification and salinity. Energy resources: Renewable and non-renewable energy resources Role of an individual in conservation of natural resources.	6
Unit – 3	

ECOSYSTEM AND BIODIVERSITY **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the Forest and grassland ecosystem. **Biodiversity** - Introduction - Definition: genetic, species and ecosystem diversity. – Value of biodiversity: consumptive use, productive use, social, ethical and optional values - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**8**
Unit – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution d. Noise pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution.	**6**
Unit – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act .	**6**
COURSE OUTCOMES: On completion of the course student will be able to 1. Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion. 2. Preserve several natural resources 3. Summarize the concept of ecosystem	

4. Control different types of pollution
5. Understand social issues and environmental legislation

TEXT BOOKS:

1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi.
3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeksha Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. Environmental Studies, P.N. Palaniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

Course Structure

SITE21 Regulations

For

B.Tech.

in

Electronics and Communication Engineering

With effective from the academic year 2021-22

sasi INSTITUTE OF TECHNOLOGY & ENGINEERING
autonomous
Accredited by **NAAC** with **"A"** Grade
Recognised by **UGC** under section 2(f) &12(B)
Approved by **AICTE** - NEW Delhi
Permanently Affiliated to **JNTUK, SBTET**
Ranked as **"A" Grade** by Govt. of A.P.
Department of Electronics & Communication Engineering

Course structure for SITE21 Regulations

B. Tech (Electronics and Communication Engineering)

Semester I (First year)

S.No	Subject Code	Course	L	T	P	C
1	21CMEGT1010	Technical English	3	0	0	3
2	21CMMAT1020	Engineering Mathematics-I	3	0	0	3
3	21CMEET1030	Basic Electrical Engineering	3	0	0	3
4	21CMCST1040	Programming for Problem Solving	3	0	0	3
5	21ECMEL1050	Computer Aided Engineering Graphics	2	0	2	3
6	21CMEGL1060	English Communication Skills Lab	0	0	3	1.5
7	21CMEEL1070	Basic Electrical Engineering Lab	0	0	3	1.5
8	21CMCSL1080	Programming for Problem Solving Lab	0	0	3	1.5
9	21CMESN1090	Environmental Science	2	0	0	0
Total Semester Credits						**19.5**

Semester II (First year)

S.No	Subject Code	Course	L	T	P	C
1	21CMMAT2010	Engineering Mathematics - II	3	0	0	3
2	21ECPHT2020	Engineering Physics	3	0	0	3
3	21CMCHT2030	Engineering Chemistry	3	0	0	3
4	21CMCST2040	Python Programming	1	0	4	3
5	21ECECT2050	Network Analysis	3	0	0	3
6	21ECPHL2060	Engineering Physics Lab	0	0	3	1.5
7	21CMEEL2070	Engineering Chemistry Lab	0	0	3	1.5
8	21ECMEL2080	Engineering Workshop	0	0	3	1.5
9	21CMMSN2090	Constitution of India, Professional Ethics & Human Rights	2	0	0	0
Total Semester Credits						**19.5**

Course Structure for

B. Tech (Electronics and Communication Engineering)

Semester III (Second year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ECMAT3010	Engineering Mathematics - III	3	0	0	3
2	21ECECT3020	Probability Theory & Stochastic Processes	3	0	0	3
3	21ECECT3030	Semiconductor Devices	3	0	0	3
4	21ECECT3040	Digital System Design	3	0	0	3
5	21ECECT3050	Signals & Systems	3	0	0	3
6	21ECECL3060	Semiconductor Devices Lab	0	0	3	1.5
7	21ECECL3070	Digital System Design Lab	0	0	3	1.5
8	21ECECL3080	Electrical Circuits Lab	0	0	3	1.5
9	21ECECS3090	Data Science using Python (Skill Oriented Course-1)	1	0	2	2
		Total Semester Credits				**21.5**

Semester IV (Second year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21CMMST4010	Management Science	3	0	0	3
2	21ECECT4020	EM Waves & Transmission Lines	3	0	0	3
3	21ECECT4030	Principles of Communication Theory	3	0	0	3
4	21ECECT4040	Electronic Circuit Analysis	3	0	0	3
5	21ECECT4050	Control Systems	3	0	0	3
6	21ECECL4060	Principles of Communication Theory Lab	0	0	3	1.5
7	21ECECL4070	Electronic Circuit Analysis Lab	0	0	3	1.5
8	21ECECL4080	Signals & Systems Lab	0	0	3	1.5
9	21ECECS4090	FPGA Architecture and Programming Using Verilog/ Matlab for Engineers (Skill Oriented Course-2)	1	0	2	2
10	21ECECN40A0	Pulse & Digital Circuits	2	0	0	0
		Total Semester Credits				21.5
H/M	**Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)**		4	0	0	4

Course Structure for

B. Tech (Electronics and Communication Engineering)

III B.Tech. V-Semester

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ECECT5010	Digital Modulation and Coding	3	0	0	3
2	21ECECT5020	Antenna Theory and Design	3	0	0	3
3	21ECECT5030	Linear IC Applications	3	0	0	3
4	21ECECP504X	Professional Elective-1	3	0	0	3
5	21ECXXO505X	Open Elective - 1	3	0	0	3
6	21ECECL5060	Digital Modulation and Coding Lab	0	0	3	1.5
7	21ECECL5070	Linear IC Applications Lab	0	0	3	1.5
8	21ECECS5080	Skill advanced course/ soft skill course-3* (Soft Skills & Aptitude Builder-1).	1	0	2	2
9	21ECECN5090	Biology for Engineers	2	0	0	0
10	21ECECR50A0	Summer Internship - 2 Months (Mandatory) after second year (to be evaluated during V semester	0	0	3	1.5
		Total Semester Credits				**21.5**
11		Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

Professional Elective-1

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ECECP504A	Computer Architecture & Organization	3	0	0	3
2	21ECECP504B	Introduction to Machine Learning	3	0	0	3
3	21ECECP504C	System Design through Verilog	3	0	0	3

Open Elective-1

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21XXECO505A	Fundamentals of Integrated Circuits	3	0	0	3
2	21XXECO505B	Fundamentals of Microprocessors and Microcontrollers	3	0	0	3
3	21XXECO505C	Fundamentals of Digital Signal Processing	3	0	0	3

Course Structure for

B. Tech (Electronics & Communication Engineering)

III B.Tech. VI-Semester

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ECECT6010	Digital Signal Processing	3	0	0	3
2	21ECECT6020	VLSI Design	3	0	0	3
3	21ECECT6030	Microprocessors & Microcontrollers	3	0	0	3
4	21ECECP604X	Professional Elective-2	3	0	0	3
5	21ECXXO605X	Open Elective - 2	3	0	0	3
6	21ECECL6060	Digital Signal Processing Lab	0	0	3	1.5
7	21ECECL6070	VLSI Design Lab	0	0	3	1.5
8	21ECECL6080	Microcontroller and Applications Lab	0	0	3	1.5
9	21ECECS6090	Skill advanced course/ soft skill course-4* Soft Skills and Aptitude Builder-2	1	0	2	2
10	21ECECN60A0	Research Methodology	2	0	0	0
						21.5
11	H/M	Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

Professional Elective-2

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ECECP604A	Embedded System Design	3	0	0	3
2	21ECECP604B	Cellular and Mobile Communications	3	0	0	3
3	21ECECP604C	Microwave Engineering	3	0	0	3

Open Elective-2

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21XXECO605A	Fundamentals of Digital Image Processing	3	0	0	3
2	21XXECO605B	Transducers and Sensors	3	0	0	3
3	21XXECO605C	Embedded Systems	3	0	0	3

Course Structure for
B. Tech (Electronics & Communication Engineering)
IV B.Tech. VII-Semester

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ECECP701X	Professional Elective-3	3	0	0	3
2	21ECECP702X	Professional Elective-4	3	0	0	3
3	21ECECP703X	Professional Elective-5	3	0	0	3
4	21ECECO704X	Open Elective - 3	3	0	0	3
5	21ECXXO705X	Open Elective - 4	3	0	0	3
6	21ECXXO706X	Humanities and Social Science Elective	3	0	0	3
7	21ECECS7070	Skill Advanced Course/ Soft Skill Course - 5* IoT and its Applications/ Microwave Circuits and Antenna Design using HFSS/Deep Learning	1	0	2	2
8	21ECECR7080	Research Internship - 2 Months (Mandatory) after Third year (to be evaluated during V semester	0	0	6	3
						23
9	H/M	Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

Professional Elective-3

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ECECP701A	Digital Image Processing	3	0	0	3
2	21ECECP701B	Low Power VLSI Design	3	0	0	3
3	21ECECP701C	Embedded and Real-Time Systems	3	0	0	3

Professional Elective-4

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ECECP702A	Wireless Sensor Networks	3	0	0	3
2	21ECECP702B	Design for Testability	3	0	0	3
3	21ECECP702C	Optical Communication	3	0	0	3

Professional Elective-5

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ECECP703A	Radar Systems	3	0	0	3
2	21ECECP703B	Internet of Things	3	0	0	3
3	21ECECP703C	Soft Computing Techniques	3	0	0	3

Open Elective-3

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21XXECO704A	Fundamentals of Internet of Things	3	0	0	3
2	21XXECO704B	Introduction to Cellular and Mobile Communications	3	0	0	3
3	21XXECO704C	Consumer Electronics	3	0	0	3

Open Elective-4

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21XXECO705A	Embedded and Real-Time Concepts	3	0	0	3
2	21XXECO705B	Digital Integrated Circuits	3	0	0	3
3	21XXECO705C	Wireless Sensor Networks	3	0	0	3

Course Structure for

B. Tech (Electronics & Communication Engineering)

IV B.Tech. VIII-Semester

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ECECR8010	Project: Project work, seminar and internship in industry	0	0	24	12
		Total				**12**

Course Structure for

B. Tech (Electronics & Communication Engineering)

COURSES OFFERED FOR MINORS

S.No.	Course Code	Course	L-T-P	Credits
1	21MRECTXXXX	Electronics Devices and Basic Circuits	3-1-0	4
2	21MRECTXXXX	Digital Electronics	3-1-0	4
3	21MRECTXXXX	Principles of Communication Systems	3-1-0	4
4	21MRECTXXXX	Signal Analysis	3-1-0	4
In addition to any of the four subjects, MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each) are compulsory in the domain of Electronics and Communication Engineering				

MOOC/NPTEL Courses for Minor program:

	Course Name	Tentative period	Duration	Course Link
Minors Program	Modern Digital Communication Techniques	July-Oct	12	https://swayam.gov.in/explorer?searchText=Modern+Digital+Communication+Techniques
	System Design Through VERILOG	July-Sept	08	https://swayam.gov.in/explorer?searchText=System+Design+Through+VERILOG
	Analog Electronic Circuits	Jan-April	12	https://onlinecourses.nptel.ac.in/noc23_ee77/preview
	Digital Signal Processing	Jan-April	12	https://nptel.ac.in/courses/117102060

Course Structure for

B. Tech (Electronics and Communication Engineering)

COURSES OFFERED FOR HONORS PROGRAMME

POOL-1

Embedded Systems: (any four of the following subjects which are not chosen as professional electives are to be considered for Honors Degree)

S.No.	Subject Code	Subject	L-T-P	Credits
1	21ECECHXXXX	Embedded System Design	3-1-0	4
2	21ECECHXXXX	Advanced Embedded Controllers	3-1-0	4
3	21ECECHXXXX	Parallel Processing	3-1-0	4
4	21ECECHXXXX	Embedded Systems for Biomedical applications	3-1-0	4
5	21ECECHXXXX	Internet of Things Fundamentals	3-1-0	4
6	21ECECHXXXX	Communication Protocols for Internet of Things	3-1-0	4
7	21ECECHXXXX	Industrial Internet of Things	3-1-0	4
8	21ECECHXXXX	Sensor Networks and Internet of Things	3-1-0	4
In addition to any of the four subjects, MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each) are compulsory in the domain of Electronics and Communication Engineering				

POOL-2

Integrated circuits and Systems: (any four of the following subjects which are not chosen as professional electives are to be considered for Honors Degree)

S.No.	Subject Code	Subject	L-T-P	Credits
1	21ECECHXXXX	VLSI Technology and Design	3-1-0	4
2	21ECECHXXXX	CMOS Analog IC Design	3-1-0	4
3	21ECECHXXXX	CMOS Digital IC design	3-1-0	4
4	21ECECHXXXX	Design for Testability	3-1-0	4
5	21ECECHXXXX	System on Chip	3-1-0	4
6	21ECECHXXXX	Programmable Logic Devices and ASIC	3-1-0	4
7	21ECECHXXXX	Scripting Language	3-1-0	4
8	21ECECHXXXX	Low Power VLSI Design	3-1-0	4
In addition to any of the four subjects, MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each) are compulsory in the domain of Electronics and Communication Engineering				

POOL-3

Communication Engineering: (any four of the following subjects which are not chosen as a professional electives are to be considered for Honors Degree)

S.No.	Subject Code	Subject	L-T-P	Credits
1	21ECECHXXXX	Wireless Sensor Networks	3-1-0	4
2	21ECECHXXXX	Software defined radio	3-1-0	4
3	21ECECHXXXX	Data Communications & Computer Networks	3-1-0	4
4	21ECECHXXXX	Cognitive radio	3-1-0	4
5	21ECECHXXXX	5G Communications	3-1-0	4
6	21ECECHXXXX	Satellite communication	3-1-0	4
7	21ECECHXXXX	Optical Communication	3-1-0	4
8	21ECECHXXXX	Global navigational satellite systems	3-1-0	4
In addition to any of the four subjects, MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each) are compulsory in the domain of Electronics and Communication Engineering				

POOL-4

Digital Signal processing: (any four of the following subjects which are not chosen as a professional elective are to be considered for Honors Degree)

S.No.	Subject Code	Subject	L-T-P	Credits
1	21ECECHXXXX	Speech Signal Processing	3-1-0	4
2	21ECECHXXXX	Video Signal Processing	3-1-0	4
3	21ECECHXXXX	Adaptive Signal Processing	3-1-0	4
4	21ECECHXXXX	Bio- Medical Signal Processing	3-1-0	4
5	21ECECHXXXX	DSP Processors and Architectures	3-1-0	4
6	21ECECHXXXX	Wavelet Theory	3-1-0	4
7	21ECECHXXXX	Multirate Systems And Filter Banks	3-1-0	4
8	21ECECHXXXX	Mathematical methods for signal processing	3-1-0	4
In addition to any of the four subjects, MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each) are compulsory in the domain of Electronics and Communication Engineering				

MOOC/NPTEL Courses for Honor program:

	Course Name		Tentative period	Duration	Course Link
Honors Program	Track-1 Embedded Systems	Embedded System Design With ARM	July-Sept	08	https://onlinecourses.nptel.ac.in/noc22_cs93/preview
		Fabrication Techniques for MEMs-based sensors: clinical perspective	July-Oct	12	https://onlinecourses.nptel.ac.in/noc22_ee76/preview
		Introduction To Industry 4.0 And Industrial Internet of Things	July-Oct	12	https://onlinecourses.nptel.ac.in/noc22_cs95/preview
		Sensors and actuators	Jan-April	12	https://onlinecourses.nptel.ac.in/noc21_ee32/preview
	Track-2 Integrated circuits and Systems	VLSI Interconnects	July-Sept	08	https://onlinecourses.nptel.ac.in/noc22_ee125/preview
		Hardware Modelling Using Verilog	July-Sept	08	https://onlinecourses.nptel.ac.in/noc22_cs94/preview
		Architectural Design of Digital Integrated Circuits	Jan-April	12	https://onlinecourses.nptel.ac.in/noc22_ee58/preview
		Design and Analysis of VLSI Subsystems	Jan-April	12	https://onlinecourses.nptel.ac.in/noc22_ee44/preview
	Track-3 Communication Engineering	Principles of Signal Estimation for MIMO/ OFDM Wireless Communication	July-Sept	12	https://onlinecourses.nptel.ac.in/noc22_ee72/preview
		Evolution Of Air Interface Towards 5G	Jan-April	08	https://onlinecourses.nptel.ac.in/noc22_ee56/preview
		Optical Wireless Communications for Beyond 5G Networks and IoT	Jan-April	12	https://onlinecourses.nptel.ac.in/noc23_ee61/preview

		Spread Spectrum Communications and Jamming	Jan-April	12	https://onlinecourses.nptel.ac.in/noc20_ee34/preview
	Track-4 Digital Signal Processing	Signal Processing for mm Wave communication	July-Oct	12	https://onlinecourses.nptel.ac.in/noc22_ee102/preview
		Pattern Recognition and Application	July-Oct	12	https://onlinecourses.nptel.ac.in/noc22_ee119/preview
		VLSI Signal Processing	Jan-April	12	https://onlinecourses.nptel.ac.in/noc20_ee44/preview
		Multirate DSP	Jan-April	12	https://archive.nptel.ac.in/courses/108/106/108106136/

Head of the Department

Head of the Department
Electronics & Communication Engineering
Sasi Institute of Technology & Engineering
Tadepalligudem-534 101. W.G.Dist., A.P.

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS (Common to all Branches)			
Subject Code	21CMMSN2090	IA Marks	30
Number of Lecture Hr/week	03	Exam Marks	70
Total Number of Lecture Hr	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit - I	**Hours**
Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**10**
Unit - II	
Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**10**
Unit – III	
State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**10**
Unit –IV	
Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	**10**
Unit – V	
Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity & Reliability

Question paper pattern:

1 Question paper consists of 10 questions.
2 Each full question carrying 14 marks.
3 Each full question will have sub question covering all topics under a unit.
4 The student will have to answer 5 full questions selecting one full question from each unit.

TEXT BOOKS:

1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn., 2001

2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

MANAGEMENT SCIENCE (Common to ECE, CSE, ECT, IT& EEE) SEMESTER IV			
Subject Code	21CMMST4010	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Course objectives:

This course will enable the students to

1. To define the Basic Concepts of Management and organization
2. To summarize the different layouts for production, statistical quality control, methods of inspection importance of inventory management in operations
3. To identify the consumer behavior and Human Resource contribution in the development of organizations.
4. To apply the techniques of project management PERT, CPM to complete the project within optimal time and cost.
5. To identify various strategies used for organizational development

Unit -I	**Hours**
Introduction to Management: Concept –nature and importance of Management – Functions of Management – Evaluation of Management thought- Theories of Motivation – Decision making process-Designing organization structure- Principles of organization - Types of organization structure.	**10**
Unit –II	
Operations Management: Principles and Types of Layouts – Work study- Statistical Quality Control- Control charts (P-chart, R-chart, and C chart). Simple problems- Material Management: Need for Inventory control- EOQ, ABC analysis (simple problems) and Types of ABC analysis (HML, SDE, VED, and FSN analysis).	**10**
Unit-III	
Functional Management & Strategic Management: **Functional Management**: Concept of HRM, HRD and PMIR- Functions of HRM - Marketing Management- Functions of Marketing, Marketing strategies based on product Life Cycle, Channels of distributions. **Strategic Management**: Vision, Mission, Goals, Strategy – Elements of Corporate Planning Process – Environmental Scanning – SWOT analysis- Steps in Strategy Formulation and Implementation, Generic Strategy alternatives	**12**
Unit –IV	
Project Management: (PERT/CPM): Development of Network – Difference between PERT and CPM Identifying Critical Path- Probability- Project Crashing (Simple Problems).	**10**
Unit-V	
Contemporary Management Practices: Basic concepts of MIS, MRP, Justin- Time (JIT) system, Total Quality Management (TQM), Six sigma , Supply Chain Management, Enterprise Resource Planning (ERP), Business Process outsourcing (BPO), Business process Re-engineering and Bench Marking, Balanced Score Card.	**08**
Total	**50**

Course outcomes:

On completion of the course student will be able to:

1. Execute the functions of Management, Principles of Management & Leadership styles.
2. Examine Statistical Quality Control Techniques, Methods of inspection, the concept of Inventory Management and Control
3. Identify different Strategies for the Development of the Organization.
4. Analyze Project Management Techniques like CPM, PERT and Crashing.
5. Apply various contemporary issues in Management Practices like TQM, Business Process

Reengineering and BPO etc.
Text Books: 1. Dr. A. R. Aryasri – Management Science, TMH 2011. 2. Dr. P.G.Ramanujam,Dr. B.V.R.Naidu and Prof. P.V.Rama Sastry: Management Science, Himalaya Publishing House 2013.
Reference Books: 1. Koontz & Weihrich: 'Essentials of Management' TMH 2011. 2. Seth & Rastogi: Global Management Systems, Cengage Learning, Delhi, 2011. 3. Robbins: Organizational Behaviors, Pearson Publications, 2011
Web References: 1. https://www.managementstudyguide.com/management_principles.htm 2. https://businessjargons.com/strategic-management.html

SOFT SKILLS & APTITUDE BUILDER – 1 SEMESTER V			
Subject Code	21CMAHS5080	IA Marks	---
Number of Practice Hours/Week	4	Exam Marks	50
Total Number of Practice Hours	64	Exam Hours	3
Credits - 2			
Section A **Soft Skills**			
Unit – 1: Intrapersonal Communication			**Hours**
Introduction to Soft Skills and its Significance **Personal Effectiveness**: Who am I and What am I; My Strengths and Weaknesses; SWOT Analysis; SMART Goal Setting; Being Proactive **Principles of Personal Vision**: Beginning with the End in Mind; Time Management: Understanding Priorities; Put First-Things-First **Activity**: Psychometric Tests and SWOT Analysis, SMART Goal Setting			**11**
Unit 2: Interpersonal Communication			
Principles of Creative Cooperation and Organisation Skills: Think Win-Win; Seek First to Understand then to be Understood; Synergize; Life-Long Learning **Emotional Intelligence**: Self-Awareness, Self-Regulation, Empathy, Assertiveness, Adoptability, Managing Emotions **Activity**: Resolving a Conflict with your Friend/Colleague/Family Member; Group Discussions & Debates			**11**
Unit – 3: 21st Century Skills			
What are 21st Century Skills? Learning Skills- Digital Literacy- Life Skills **Critical Thinking**: Active Listening, Observation, Introspection, Analytical Thinking, Open Mindedness **Problem Solving**: Understanding the Complexity of the Problem, Defining the Problem, Cause and Effect Analysis, Exploring Possible Solutions, Planning Actions, Analysing Results of your Actions, Getting Feedback, Redefining the Problem, The Problem Solving Cycle **Decision Making**: Managing Conflict, Conflict Resolution, Methods of Decision Making, Effective Decision Making in Teams – Methods & Styles **Activity**: Case Study			**10**
Section B **Aptitude Builder**			
Unit – 4: Ratios & Percentages			
Definition of Ratio, Properties of Ratios, Comparison of Ratios, Problems on Ratios, Compound Ratio, Problems on Proportion, Mean Proportional and Continued Proportion. **Partnership:** Introduction, Relation between Capitals, Period of Investments and Shares **Number System:** Classification of Numbers, Divisibility Rules, Finding the Units Digit, Finding Remainders in Divisions Involving Higher Powers, LCM and HCF Models **Percentages:** Introduction, converting a Percentage into Decimals, Converting a Decimal into Percentage, Percentage Equivalent of Fractions, Problems on Percentages **Profit And Loss:** Problems on Profit and Loss Percentage, Relation between Cost Price and Selling Price, Discount and Marked Price, Two Different Articles Sold at Same Cost Price, Two Different Articles Sold at Same Selling Price Gain% / Loss% on Selling Price **Problems on Ages:** Introduction, Problems based on Ages **Averages:** Definition of Average, Rules of Average, Problems on Average, Problems on Weighted Average, Finding Average using Assumed Mean Method			**16**

Alligation and Mixture: Problems on Mixtures, Alligation Rule, Problems on Alligation	
Unit – 5: Mental Ability	
Difference Series, Product Series, Squares Series, Cubes Series, Alternate Series Combination Series, Miscellaneous Series, Place Values of Letters **Number and Letter Analogies:** Definition of Analogy, Problems on Number Analogy, Problems on Letter Analogy, Problems on Verbal Analogy **Odd Man Out:** Problems on Number Odd Man Out, Problems on Letter Odd Man Out, Problems on Verbal Odd Man Out **Coding and Decoding:** Coding using Same Set of Letter, Coding using Different Set of Letters, Coding into a Number, Problems on R-Model **Blood relations:** Defining the Various Relations among the Members of a Family, Solving Blood Relation Puzzles, Solving the Problems on Blood Relations using Symbols and Notations **Direction Sense:** Solving Problems by Drawing the Paths, Finding the Net Distance Travelled, Finding the Direction, Problems on Clocks ,Problems on Shadows	**16**

Section-A: Text (T) / Reference (R) Books:	
For Units 1, 2, & 3	
T1	English and Soft Skills, Dr. S. P. Dhanvel, Orient Blackswan, 2011
R1	Seven Habits of Highly Effective People, Stephen R Covey
R2	Emotional Intelligence, Daniel Goleman, Bantom Book, 2006
R3	21st Century Skills: Learning for Life in our Times, Bernie Trilling, Charles Fadel; John Wiley & Sons
For Units 4&5	
T1	R S Agarwal, S Chand, 'Quantitative Aptitude'
T2	R S Agarwal, S.Chand , 'A Modern Approach to Logical Reasoning'
R1	Quantitative Aptitude for CAT By Arun Sharma
R2	GL Barrons, Mc Graw Hills, Thorpe's Verbal Reasoning, LSAT Materials
Course Outcomes: On completion of this course, students can	
Section A: Soft Skills	
CO1	re-engineer attitude and understand its influence on behaviour
CO 2	develop interpersonal skills and be an effective goal oriented team player
CO 3	develop holistic personality with a mature outlook to function effectively in different circumstances
Section B: Aptitude Builder	
CO 4	solve the real-time problems for performing job functions easily
CO 5	analyse the problems logically and critically

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 03

Unit -1: Introduction	**Hours**
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	**08**
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**08**
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	**12**
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	**12**

genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms.** Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

SOFT SKILLS & APTITUDE BUILDER – 2 SEMESTER VI			
Subject Code	21CMAHS6090	IA Marks	--
Number of Practice Hours/Week	2	Exam Marks	50
Total Number of Practice Hours	64	Exam Hours	3
Credits - 2			
Section A **Soft Skills**			
Unit – 1: Communicative Competence			**Hours**
Verbal Reasoning: Selecting Words, Spotting Errors, Ordering of Words, Sentence Formation, Paragraph Formation, Ordering of Sentences, Reading Comprehension, Completing Statements, Verbal Analogies, Cause and Effect, Syllogism, Logical Sequence of Words, Verbal Reasoning, Analysing Arguments, Verification of Truth, Matching Definitions, Theme Detection E-Mail Etiquette, Reporting News Activity: Completing Textual Exercises			**16**
Unit 2: Career and Employability Skills			
What is a Career: Career vs Job, Career Values & Grid, Skills vs Strengths, Spotting Skills/Reflection of Present Skills, Meeting the Expectation of your Employer, Matching your Skills with the Required Skills, Preparing Resume, Preparing for Interviews & Structuring Answers Activity: Resume Building, Interviews, Presentations, Digital Resumes			**16**
Section B **Aptitude Builder**			
Unit – 3: Time and Work			
Pipes and Cisterns: Problems on Unitary method, Relation between Men, Days, Hours and Work, Problems on Man-Day-Hours Method, Problems on Alternate Days, Problems on Pipes and Cisterns. **Time , Distance and Speed, Problems on Trains, Boats and Streams:** Relation between Speed, Distance and Time, Converting km/h into m/s and vice versa , Problems on Average Speed, Problems on Relative Speed, Problems on Circular Tracks, Problems on Races **Problems on Trains:** Two Trains Moving in Opposite Direction, Two Trains Moving in same Direction, A Train Crossing a Stationary Object of a Given Length like a Platform or Bridge, A Train Crossing a Stationary Object like a Pole or a Man **Boats and Streams:** Time Based, which can be considered as a Point Object Speed Based, Distance Based, Average Speed Based			**11**
Unit – 4: Logical and Analytical Reasoning			
Seating Arrangement: Linear Arrangement, Circular Arrangement, Tabler, Triangular Arrangement, Complex Arrangement. **Clocks :** Finding the Angle When the Time is Given, Finding the Time When the Angle is Known, Relation between Angles, Minutes and Hours, Position of Hands of the Clock, Time Gained or Lost by the Clock, Mirror /Water Image-based Time. **Calendars :** Definition of a Leap Year, Finding the Number of Odd Days, Framing the Year Code for Centuries, Finding the Day of any Random Calendar Date **Syllogisms:** Finding the Conclusions using Venn Diagram Method, Finding the Conclusions using Syllogism Method **Simple Interest:** Definitions, Problems on Interest and Amount, Problems when Rate of Interest and Time Period are Numerically Equal **Compound Interest:** Definition and Formula for Amount in Compound Interest, Difference between Simple Interest and Compound Interest for 2 Years on the Same Principle and Time Period.			**11**
Unit – 5: Permutations, Probability, Areas and Volumes			

Definition of permutation , Problems on Permutations , Definition of Combinations , problems on Combinations **Probability:** Definition of Probability, Problems on Coins, Problems on Dice, Problems on Deck of Cards , Problems on Years **Mensuration - 2D:** Formulas for Areas, Formulas for Volumes of Different Solids, Problems on Areas **Mensuration - 3D:** Problems on Volumes, Problems on Surface Areas		**10**
Text (T) / Reference (R) Books:		
For Units 1 & 2		
T1	R.S. Agarwal, Verbal & Non-Verbal Reasoning, S. Chand & Co., Latest ed. 2003	
T2	Soft Skills: Enhancing Employability: Connecting Campus with Corporate by MS Rao, IK International Publishing House	
R2	How to Prepare for Verbal Ability and Reading Comprehension, Arun Sharma, Meenakshi Upadhay, Mc Graw Hill	
For Units 3, 4, & 5		
T1	R S Agarwal, S Chand, 'Quantitative Aptitude'	
T2	R S Agarwal, S.Chand , 'A modern approach to Logical reasoning'	
R1	Quantitative Aptitude for CAT By Arun sharma	
R2	GL Barrons, Mc Graw Hills, Thorpe's verbal reasoning, LSAT Materials	
Course Outcomes: On completion of this course, students can		
Section A: Soft Skills		
CO 1	learn and practice effective communication skills	
CO 2	develop broad career plans, evaluate the employment market, and become industry ready	
Section B: Aptitude Builder		
CO 3	develop accuracy on time and distance and units related solutions	
CO 4	solve the real-time problems for performing job functions easily	
CO 5	solve problems related to permutations and combinations, probability, areas and volumes	

COURSE STRUCTURE

SITE21

REGULATIONS

For

Computer Science and Engineering

With effective from the Academic Year 2021-22

SITE21 Regulations

COURSE STRUCTURE for B. Tech. (CSE)

Semester I (First year I -I)

S.No	Subject Code	Course	Hours			Credits
			L	T	P	
1	21CMEGT1010	Technical English	3	0	0	3
2	21CMMAT1020	Engineering Mathematics - I	3	0	0	3
3	21CMEET1030	Basic Electrical Engineering	3	0	0	3
4	21CMCST1040	Programming for Problem Solving	3	0	0	3
5	21CSMEL1050	Computer Aided Engineering Graphics	2	0	2	3
6	21CMEGL1060	English Communication Skills Lab	0	0	3	1.5
7	21CMEEL1070	Basic Electrical Engineering Lab	0	0	3	1.5
8	21CMCSL1080	Programming for Problem Solving Lab	0	0	3	1.5
9	21CMESN1090	Environmental Science	2	0	0	0
		Total	**16**	**0**	**11**	**19.5**

Semester II (First year I -II)

S. No	Subject Code	Course	Hours			Credits
			L	T	P	
1	21CMMAT2010	Engineering Mathematics - II	3	0	0	3
2	21CSPHT2020	Engineering Physics	3	0	0	3
3	21CMCHT2030	Engineering Chemistry	3	0	0	3
4	21CMCST2040	Python Programming	1	0	4	3
5	21CSCST2050	Data Structures	3	0	0	3
6	21CSPHL2060	Engineering Physics Lab	0	0	3	1.5
7	21CMCHL2070	Engineering Chemistry Lab	0	0	3	1.5
8	21CSCSL2080	Data Structures Lab	0	0	3	1.5
9	21CMMSN2090	Constitution of India, Professional Ethics & Human Rights	2	0	0	0
		Total	**16**	**0**	**11**	**19.5**

Semester III (Second year II-I)

S. No	Code	Course Title	Hours			Credits
			L	T	P	
1	21CMMAT3010	Probability Distributions & Statistical Methods	3	0	0	3
2	21CSECT3020	Analog & Digital Electronics	3	0	0	3
3	21CSCST3030	Computer Organization	3	0	0	3
4	21CSCST3040	Java Programming	3	0	0	3
5	21CSCST3050	Data Base Management Systems	3	0	0	3
6	21CSCSL3060	Analog &Digital Electronics Lab	0	0	3	1.5
7	21CSCSL3070	Java Programming Lab	0	0	3	1.5
8	21CSCSL3080	Data Base Management Systems Lab	0	0	3	1.5
9	21CSCSS3090	Data Science Using Python	0	0	3	2
10	21CMBIN3100	Biology for Engineers	2	0	0	0
		Total	**17**	**0**	**12**	**21.5**

Semester IV (Second year II-II)

S.No	Code	Course Title	Hours			Credits
			L	T	P	
1	21CMMAT4010	Discrete Mathematics	3	0	0	3
2	21CMMST4020	Engineering Economics & Financial Management	3	0	0	3
3	21CSCST4030	Operating systems	3	0	0	3
4	21CSCST4040	Design and Analysis of Algorithms	3	0	0	3
5	21CSCST4050	Software Engineering	3	0	0	3
6	21CSCSL4060	Operating systems Lab	0	0	3	1.5
7	21CSCSL4070	Design and Analysis of Algorithms Lab	0	0	3	1.5
8	21CSSCL4080	Software Engineering Lab	0	0	3	1.5
9	21CSCSS4090	MEAN Stack Technologies	2	0	0	2
		Total	**17**	**0**	**9**	**21.5**

Semester V (Third Year III-I)

S. No	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	PC	21CSCST5010	Automata Theory& Compiler Design	3	0	0	3
2	PC	21CSCST5020	Computer Networks	3	0	0	3
3	PC	21CSCST5030	Data Warehousing and Mining	3	0	0	3
4	PE-I	21CSCSP504X	Professional Elective -I	3	0	0	3
5	OE-I	21CSXXO505X	Open Elective - I	3	0	0	3
6	PC	21CSCSL5060	Computer Networks lab	0	0	3	1.5
7	PC	21CSCSL5070	Data Mining Lab	0	0	3	1.5
8	SOC	21CMAHS5080	**Skill Oriented Course** Soft Skills & Aptitude Builder - 1	1	0	2	2
9	MC	21CSCSN5090	Intellectual Property Rights	2	0	0	0
Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester) (21CSCSR5100)				0	0	0	1.5
						Total credits	**21.5**
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4

Category	Credits
Professional core Courses	12
Professional Elective courses	3
Open Elective Course	3
Skill oriented course	2
Summer Internship	1.5
Total Credits	**21.5**

Professional Elective - I	
Code	**Course Title**
21CSCSP504A	Software Testing
21CSCSP504B	Software Project Management
21CSCSP504C	Software Quality Assurance
21CSCSP504D	Agile Software Development

Semester VI (Third year III-II)

S. No	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	PC	21CSCST6010	Machine Learning	3	0	0	3
2	PC	21CSCST6020	Cryptography & Network Security	3	0	0	3
3	PC	21CSCST6030	Unified Modelling Language	3	0	0	3
4	PE-I	21CSCSP604X	Professional Elective -II	3	0	0	3
5	OE-II	21CSXXO605X	Open Elective Course	3	0	0	3
6	PC	21CSCSL6060	Unix Programming Lab	0	0	3	1.5
7	PC	21CSCSL6070	Machine Learning Lab	0	0	3	1.5
8	PC	21CSCSL6080	Unified Modelling LanguageLab	0	0	3	1.5
9	SOC	21CMAHS6090	**Skill Oriented Course** Soft Skills & Aptitude Builder - 2	1	0	2	2
10	MC	21CSCSN6100	**Mandatory course** Essence of Indian Traditional Knowledge	2	0	0	0
						Total credits	**21.5**
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4

Category	Credits
Professional core courses	13.5
Professional Elective courses	3
Open Elective Course	3
Skill-oriented course/ soft skill course*	2
Mandatory course (AICTE)	0
Total Credits	**21.5**

Professional Elective - II	
Code	**Course Title**
21CSCSP604A	Data Science
21CSCSP604B	Artificial Intelligence
21CSCSP604C	Cloud Computing
21CSCSP604D	Hadoop & Big Data

Semester VII (Fourth year IV-I)

S. No	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	PE	21CSCSP701X	Professional Elective -III	3	0	0	3
2	PE	21CSCSP702X	Professional Elective - IV	3	0	0	3
3	PE	21CSCSP703X	Professional Elective - V	3	0	0	3
4	OE-III	21CSXXO704X	Open Elective Course	3	0	0	3
5	OE-IV	21CSXXO705X	Open Elective Course	3	0	0	3
6	HS	21CSMST7060	Management Science	0	0	3	3
7	SOC	21CSCSS7070	**Skill Oriented Course** ETL Spark	0	0	3	2
	Summer Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester)(21CSCSR7080)			0	0	0	3
						Total credits	**23**
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4

Professional Elective - III	
Code	**Course Title**
21CSCSP701A	Network Protocols
21CSCSP701B	Ad-hoc & Sensor Networks
21CSCSP701C	Mobile Computing
21CSCSP701D	Cyber Security

Professional Elective - V	
Code	**Course Title**
21CSCSP703A	Block-Chain Technologies
21CSCSP703B	Wireless Network Security
21CSCSP703C	Deep Learning
21CSCSP703D	Neural Networks and Soft Computing

Professional Elective - III	
Code	**Course Title**
21CSCSP702A	Mobile Application Development
21CSCSP702B	Social Networks & Semantic Web
21CSCSP702C	Computer Vision
21CSCSP702D	Ethical Hacking

Semester VIII (Fourth year IV-II)

S. No	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	PR	21CSCSR8010	Project	0	0	12	12
						Total credits	**12**

ENVIRONMENTAL SCIENCE			
Subject Code	21CMCHN1090/2090	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Acquire knowledge on global environmental challenges.
2. Learn different types of natural resources
3. Create awareness on biodiversity and ecology.
4. Gain scientific knowledge on environmental pollution
5. Acquire knowledge on water conservation methods and environmental legislation

Module -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Role of Information Technology in Environment and human health.	**Hours – 6**
Module -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Floods, drought, , dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: Effects of modern agriculture - fertilizer-pesticide problems, water logging, eutrophication, biological magnification and salinity. Energy resources: Renewable and non-renewable energy resources Role of an individual in conservation of natural resources.	**Hours –6**
Module – 3	
ECOSYSTEM AND BIODIVERSITY **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the Forest and grassland ecosystem. **Biodiversity** - Introduction - Definition: genetic, species and ecosystem diversity. – Value of biodiversity: consumptive use, productive use, social, ethical and optional values - Hot-spots of	**Hours –8**

biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
Module – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Noise pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution.	**Hours –6**
Module – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act .	**Hours –6**

COURSE OUTCOMES:

On completion of the course student will be able to

1. Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion.
2. Preserve several natural resources
3. Summarize the concept of ecosystem
4. Control different types of pollution
5. Understand social issues and environmental legislation

QUESTION PAPER PATTERN:

1. Question paper consists of 10 questions.
2. Each full question carrying 14 marks.
3. Each full question will have sub question covering all topics under a unit.
4. The student will have to answer 5 full questions selecting one full question from each unit.

TEXT BOOKS:

1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi.
3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeksha Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. Environmental Studies, P.N. Palaniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS SEMESTER - I/I			
Subject Code	21CMMSN1090	IA Marks	30
Number of Lecture Hours/Week	03	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit - I	
Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours – 10**
Unit - II	
Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours – 10**
Unit – III	
State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**Hours – 10**
Unit –IV	
Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	**Hours – 10**
Unit – V	
Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours – 10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity & Reliability

QUESTION PAPER PATTERN:

1. It will have 5 questions with internal choice.
2. Each question carries 14 marks.
3. Each full question comprises sub questions covering all topics under a unit.

TEXT BOOKS:

1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn., 2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma, **"Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 03

Unit -1: Introduction	**Hours**
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	**08**
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**08**
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	**12**
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	**12**

genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms**. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

INTELLECTUAL PROPERTY RIGHTS			
Subject Code	21CACAN3100	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 00

Unit -1:	Hours
Introduction: Introduction to Intellectual property, types of intellectual property, importance of intellectual property rights, agencies Responsible for Intellectual property Registration, Regulatory – Compliance and Liability Issues.	08
Unit -2:	
Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, Transfer of Rights, protectable matter, selecting and evaluating trade mark, Registrations of Trade Marks, Claims. **Trade Secrets:** Determination of trade secret status, liability for misappropriations of trade secrets, protection for submission.	10
Unit – 3:	
Copy rights: Fundamental of copy right, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, notice of copy right. **Patents:** introduction, patent searching process, ownership rights and transfer	10
Unit – 4:	
Cyber Law – Information Technology Act – Cyber Crime and E-commerce – Data Security – Confidentiality – Privacy – International aspects of Computer and Online Crime.	10
Unit – 5:	
New development of Intellectual Property: Emerging trends in trade mark; copy rights, patent, International overview on intellectual property.	12

Text(T) / Reference(R) Books:	
T1	Intellectual property right, Deborah, E, Bouchoux, cengage learning.
T2	Cyber Law. Text & Cases, South-Western's Special Topics collections
T3	R. Radha Krishnan, S. Balasubramanian: "Intellectual Property Rights", Excel Books, New Delhi
R1	A short course in International Intellectual Property Rights – Karla C. Shippey, World Trade Press – 2 nd Edition
R2	Intellectual Property Rights: N K Acharya: ISBN: 9381849309

ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE			
Subject Code	21CTCTN6100	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	30	Exam Hours	03
Credits– 03			

Course Objectives:

1. The course aims at imparting basic principles of thought process, reasoning and inferencing. Sustainability is at the core of Indian Traditional Knowledge Systems connecting society and nature.
2. Holistic life style of Yogic-science and wisdom capsules in Sanskrit literature are also important in modern society with rapid technological advancements and societal disruptions.
3. The course focuses on introduction to Indian Knowledge System, Indian perspective of modern scientific world-view and basic principles of Yoga and holistic health care system

Unit -1: Introduction to Traditional Knowledge	**Hours**
Define Traditional Knowledge- Nature and Characteristics- Scope and Importance-kinds of Traditional Knowledge- The historical impact of social change on Traditional Knowledge Systems- Value of Traditional knowledge in global economy.	**06**
Unit-2: Basic structure of Indian Knowledge System	
AstadashVidya- 4 Ved - 4 Upaved (Ayurved, Dhanurved, GandharvaVed & SthapthyaAdi), 6 vedanga (Shisha, Kalppa, Nirukha, Vykaran, Jyothisha & Chand),4 upanga(Dharmashastra, Meemamsa, purana & Tharka Shastra).	**06**
Unit–3: Modern Science and Indian Knowledge System	
Indigenous Knowledge, Characteristics- Yoga and Holistic Health care-case studies.	**06**
Unit–4: Protection of Traditional Knowledge	
The need for protecting traditional knowledge - Significance of Traditional knowledge Protection-Role of government to harness Traditional Knowledge	**06**
Unit–5: Impact of Traditions	
Philosophical Tradition (Sarvadarshan) Nyaya, Vyshepec, Sankhya, Yog, Meemamsa, Vedantha, Chavanka, Jain &Boudh - Indian Artistic Tradition - Chitrakala, Moorthikala, Vasthukala , Sthapthya, Sangeetha, NruthyaYevamSahithya	**06**

Text(T) / Reference(R) Books:	
T1	Traditional Knowledge System in India, by Amit Jha, 2009.
T2	Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, PratibhaPrakashan 2012.
T3	Sivaramakrishnan (Ed.), Cultural Heritage of India-course material, BharatiyaVidya
R1	Swami Jitatmanand, Holistic Science and Vedant, BharatiyaVidyaBhavan
R2	Yoga Sutra of Patanjali, Ramakrishna Mission, Kolkata
	Web Links: 1.https://www.youtube.com/watch?v=LZP1StpYEPM 2.http://nptel.ac.in/courses/121106003/ 3.https://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_21/wipo_grtkf_ic_21_ref_facilitators_text.pdf

Course Outcomes: On completion of this course, students can	
CO1	Identify the concept of Traditional knowledge and its importance.
CO2	Classify the Indian Traditional Knowledge
CO3	Compare Modern Science with Indian Traditional Knowledge system.
CO4	Analyze the role of Government in protecting the Traditional Knowledge
CO5	Understand the impact of Philosophical tradition on Indian Knowledge System.

1.3.1
IT

SITE 21

COURSE STRUCTURE AND DETAILED SYLLABUS

for

Bachelor of Technology
in
Information Technology

With effective from the

Academic Year 2021-22

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Department of Information Technology

I B. Tech I Semester Course structure for the Academic Year 2021-2022

S. No.	Code	Course Title	Hours			Credits
			L	T	P	
1	21CMEGT1010	Technical English	3	0	0	3
2	21CMMAT1020	Engineering Mathematics - I	3	0	0	3
3	21CMEET1030	Basic Electrical Engineering	3	0	0	3
4	21CMCST1040	Programming for Problem Solving	3	0	0	3
5	21ITMEL1050	Computer Aided Engineering Graphics	2	0	2	3
6	21CMEGL1060	English Communication Skills Lab	0	0	3	1.5
7	21CMEEL1070	Basic Electrical Engineering Lab	0	0	3	1.5
8	21CMCSL1080	Programming for Problem Solving Lab	0	0	3	1.5
9	21CMESN1090	Environmental Science	2	0	0	0
		Total	**16**	**0**	**11**	**19.5**

I B. Tech II Semester Course structure for the Academic Year 2021-2022

S. No.	Code	Course Title	Hours			Credits
			L	T	P	
1	21CMMAT2010	Engineering Mathematics - II	3	0	0	3
2	21ITPHT2020	Engineering Physics	3	0	0	3
3	21CMCHT2030	Engineering Chemistry	3	0	0	3
4	21CMCST2040	Python Programming	1	0	4	3
5	21ITITT2050	Data Structures	3	0	0	3
6	21ITPHL2060	Engineering Physics Lab	0	0	3	1.5
7	21CMCHL2070	Engineering Chemistry Lab	0	0	3	1.5
8	21ITITL2080	Data Structures Lab	0	0	3	1.5
9	21CMMSN2090	Constitution of India, Professional Ethics & Human Rights	2	0	0	0
		Total	**16**	**0**	**11**	**19.5**

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II B. Tech I Semester Course structure for the Academic Year 2022-2023

S. No.	Code	Course Title	Hours			Credits
			L	T	P	
1	21CMMAT3010	Probability Distributions & Statistical Methods	3	0	0	3
2	21ITECT3020	Analog & Digital Electronics	3	0	0	3
3	21ITITT3030	Computer Organization	3	0	0	3
4	21ITITT3040	Java Programming	3	0	0	3
5	21ITITT3050	Data Base Management Systems	3	0	0	3
6	21ITECL3060	Analog &Digital Electronics Lab	0	0	3	1.5
7	21ITITL3070	Java Programming Lab	0	0	3	1.5
8	21ITITL3080	Data Base Management Systems Lab	0	0	3	1.5
9	21ITITS3090	Data Science Using Python	0	0	3	2
10	21CMBIN3100	Biology for Engineers	2	0	0	0
		Total	**17**	**0**	**12**	**21.5**

II B. Tech II Semester Course structure for the Academic Year 2022-2023

S. No.	Code	Course Title	Hours			Credits
			L	T	P	
1	21CMMAT4010	Discrete Mathematics	3	0	0	3
2	21CMMST4020	Engineering Economics & Financial Management	3	0	0	3
3	21ITITT4030	Operating systems	3	0	0	3
4	21ITITT4040	Design and Analysis of Algorithms	3	0	0	3
5	21ITITT4050	Software Engineering	3	0	0	3
6	21ITITL4060	Operating systems Lab	0	0	3	1.5
7	21ITITL4070	Design and Analysis of AlgorithmsLab	0	0	3	1.5
8	21ITITL4080	Software Engineering Lab	0	0	3	1.5
9	21ITITS4090	MEAN Stack Technologies	2	0	0	2
		Total	**17**	**0**	**9**	**21.5**

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III B. Tech I Semester Course structure for the Academic Year 2023-2024

S. No.	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	PC	21ITITT5010	Automata Theory& Compiler Design	3	0	0	3
2	PC	21ITITT5020	Computer Networks	3	0	0	3
3	PC	21ITITT5030	Data Warehousing and Data Mining	3	0	0	3
4	PE-I	21ITITP504X	Professional Elective -I	3	0	0	3
5	OE-I	21ITXXO505X	Open Elective - I	3	0	0	3
6	PC	21ITITL5060	Computer Networks Lab	0	0	3	1.5
7	PC	21ITITL5070	Data Mining using Python Lab	0	0	3	1.5
8	SOC	21ITITS5080	Skill Oriented Course	1	0	2	2
9	MC	21ITITN5090	Mandatory course (AICTE suggested)	2	0	0	0
Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester)				0	0	0	1.5
						Total Credits	**21.5**
Honors/Minor courses(The hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4

Category	Credits
Professional Core Courses	12
Professional Elective courses	3
Open Elective Course	3
Skill oriented course	2
Summer Internship	1.5
Total Credits	**21.5**

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III B. Tech II Semester Course structure for the Academic Year 2023-2024

S. No.	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	PC	21ITITT6010	Machine Learning	3	0	0	3
2	PC	21ITITT6020	Big Data Analytics	3	0	0	3
3	PC	21ITITT6030	Object Oriented Analysis and Design	3	0	0	3
4	PE-I	21ITITP604X	Professional Elective -II	3	0	0	3
5	OE-I	21ITXXO605X	Open Elective-II	3	0	0	3
6	PC	21ITITL6060	Machine Learning Lab	0	0	3	1.5
7	PC	21ITITL6070	OOAD Lab	0	0	3	1.5
8	PC	21ITITL6080	R Programming Lab	0	0	3	1.5
9	SOC	21ITITS6090	Skill Oriented Course	1	0	2	2
10	MC	21ITITN6100	Mandatory course (AICTE suggested)	2	0	0	0
						Total credits	**21.5**
			Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

Category	Credits
Professional core Courses	13.5
Professional Elective courses	3
Open Elective Course	3
Skill oriented course	2
Total Credits	21.5

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IV B. Tech I Semester Course structure for the Academic Year 2024-2025

S. No.	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	PC	21ITITP701X	Professional Elective -III	3	0	0	3
2	PC	21ITITP702X	Professional Elective -IV	3	0	0	3
3	PC	21ITITP703X	Professional Elective -V	3	0	0	3
4	OE-I	21ITXXO704X	Open Elective - III	3	0	0	3
5	OE-II	21ITXXO705X	Open Elective - IV	3	0	0	3
6	HS-I	21ITXXO706X	Humanities and Social ScienceElective - I	3	0	0	3
7	SOC	21ITITS7070	**Skill Oriented Course**	1	0	2	2
Summer Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester)				0	0	0	3
						Total Credits	**23**
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4

IV B. Tech II Semester Course structure for the Academic Year 2024-2025

S. No.	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	Project	21ITITR8010	Project Work, Seminar and Internship in Industry	0	0	24	12
						Total Credits	12

Professional Electives

Professional Elective - I	
Course Code	**Course Title**
21ITITP504A	Artificial Intelligence
21ITITP504B	Fundamentals of Data Science
21ITITP504C	Mobile Application Development
Professional Elective - II	
Course Code	**Course Title**
21ITITP604A	Computer Graphics
21ITITP604B	User Interface
21ITITP604C	R Programming
Professional Elective - III	
Course Code	**Course Title**
21ITITP701A	Neural Networks and Soft Computing
21ITITP701B	Mobile Computing
21ITITP701C	Cloud Computing
Professional Elective - IV	
Course Code	**Course Title**
21ITITP702A	Software Testing Methodologies
21ITITP702B	Software Project Management
21ITITP702C	Software Architecture and Design Patterns
Professional Elective - V	
Course Code	**Course Title**
21ITITP703A	Deep Learning Techniques
21ITITP703B	Social Networks & Semantic Web
21ITITP703C	Intelligent Agents

sasi INSTITUTE OF TECHNOLOGY & ENGINEERING
autonomous
Department of Information Technology

Accredited by **NAAC** with **"A"** Grade
Recognised by **UGC** under section 2(f) &12(B)
Approved by **AICTE** - NEW Delhi
Permanently Affiliated to **JNTUK, SBTET**
Ranked as **"A" Grade** by Govt. of A.P.

OPEN ELECTIVES COURSES OFFERED BY IT TO OTHER DEPARTMENTS

V SEM OPEN ELECTIVE COURSES

S. No	Subject Code	Name of the subject	L	T	P	CREDITS
1.	21XXITO50XA	Operating Systems	3	0	0	3
2.	21XXITO50XB	Data Structures	3	0	0	3
3.	21XXITO50XC	Designing Data Base Management Systems	3	0	0	3

VI SEM OPEN ELECTIVE COURSES

S. No	Subject Code	Name of the subject	L	T	P	CREDITS
1.	21XXITO60XA	R Programming	3	0	0	3
2.	21XXITO60XB	Software Engineering	3	0	0	3
3.	21XXITO60XC	Mobile Application Development	3	0	0	3

VII SEM OPEN ELECTIVE COURSES

S. No	Subject Code	Name of the subject	L	T	P	CREDITS
1.	21XXITO707A	Open Source Software	3	0	0	3
2.	21XXITO707B	Cloud Computing	3	0	0	3
3.	21XXITO707C	E Commerce	3	0	0	3

Signature of the HoD

Head of the Department
Department of Information Technology
Sasi Institute of Technology & Engineering
TADEPALLIGUDEM, W.G.Dt., A.P.

ENVIRONMENTAL SCIENCE			
Subject Code	21CMCHN1090/2090	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Acquire knowledge on global environmental challenges.
2. Learn different types of natural resources
3. Create awareness on biodiversity and ecology.
4. Gain scientific knowledge on environmental pollution
5. Acquire knowledge on water conservation methods and environmental legislation

Module -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Role of Information Technology in Environment and human health.	**Hours – 6**
Module -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Floods, drought, , dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: Effects of modern agriculture - fertilizer-pesticide problems, water logging, eutrophication, biological magnification and salinity. Energy resources: Renewable and non-renewable energy resources Role of an individual in conservation of natural resources.	**Hours –6**
Module – 3	
ECOSYSTEM AND BIODIVERSITY **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the Forest and grassland ecosystem. **Biodiversity** - Introduction - Definition: genetic, species and ecosystem diversity. – Value of biodiversity: consumptive use, productive use, social, ethical and optional values - Hot-spots of	**Hours –8**

biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
Module – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Noise pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution.	**Hours –6**
Module – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act .	**Hours –6**

COURSE OUTCOMES:

On completion of the course student will be able to

1. Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion.
2. Preserve several natural resources
3. Summarize the concept of ecosystem
4. Control different types of pollution
5. Understand social issues and environmental legislation

QUESTION PAPER PATTERN:

1. Question paper consists of 10 questions.
2. Each full question carrying 14 marks.
3. Each full question will have sub question covering all topics under a unit.
4. The student will have to answer 5 full questions selecting one full question from each unit.

TEXT BOOKS:

1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi.
2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi.
3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeksha Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. Environmental Studies, P.N. Palaniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS SEMESTER - I/I			
Subject Code	21CMMSN1090	IA Marks	30
Number of Lecture Hours/Week	03	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit - I	
Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours – 10**
Unit - II	
Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours – 10**
Unit – III	
State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**Hours – 10**
Unit –IV	
Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	**Hours – 10**
Unit – V	
Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours – 10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity & Reliability

QUESTION PAPER PATTERN:

1. It will have 5 questions with internal choice.
2. Each question carries 14 marks.
3. Each full question comprises sub questions covering all topics under a unit.

TEXT BOOKS:

1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn., 2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma, **"Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

BIOLOGY FOR ENGINEERS
SEMESTER V

Subject Code	18CMMSN50A0	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	48	Exam Hours	03
Pre-requisite	Natural Science	Credits – 00	

Course Objectives:

This course will enable students to

1. Understand biology as an independent scientific discipline.
2. Understand the Hierarchy of life forms at various phenomenological level
3. Understand Gene and gene mapping
4. Understand molecules of life and enzymes
5. Understand proteins and enzymology
6. Understand microbiology and metabolis

Unit -1	**Hours**
Introduction- Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor.	8
Unit -2	
Classification- Hierarchy of life forms at phenomenological level- classification based on (a) cellularity- Unicellular or multicellular (b) ultra-structure- prokaryotes or eucaryotes. (c) energy and Carbon utilization - Autotrophs, heterotrophy, lithotropes (d) Ammonia excretion – aminotelic, uricoteliec, ureoteli (e) Habitata - acquatic or terrestrial (f) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D.Melanogaster, C. elegance, A. Thaliana, M. Musculus	10
Unit -3	
Genetics - Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be given not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	10
Unit – 4	
Enzymes: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification- Mechanism of enzyme action. - examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins:** Proteins- structure and function. Hierarchy in protein structure. Primary secondary, tertiary and Quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a	10

genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of genetic code. Define gene in terms of complementation and recombination	
Unit-5	
Microbiology & Metabolism: Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergonic reactions. Concept of Keq and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to CO2 + H2O (Glycolysis and Krebs cycle) and synthesis of glucose from CO2 and H2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms**. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10
Total	**48**

Course outcomes:

On completion of the course student will be able to

1. Able to describe how biological observations of 18th Century that lead to major discoveries.
2. Able to convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological
3. Able to demonstrate the highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring.
4. Able to convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine.
5. Able to classify enzymes and distinguish between different mechanisms of enzyme action.
6. Able to demonstrate that "Genetics is to biology what Newton's laws are to Physical Sciences".

Text Books:

1. Campbell, N. A, Reece, J. B, Urry, Lisa Cain, M, L. Wasserman, S. A. Minorsky, P. V. Jackson, R. B, Biology: A Global Approach: Pearson Education. Pearson Publishers, 11th Edition,2017
2. Conn, E.E, Stumpf, P.K, Bruening, G. Doi, R.H, Outlines of Biochemistry, John Wiley and Sons, 1987
3. L.M J.P. Harley and C.A. Klein, Microbiology, C. Brown Publishers, 2nd Edition, 1995.

Reference Books:

1. Nelson, D. L. and Cox, M. M, Principles of Biochemistry, W.H. Freeman and Company, 7th Edition, 2017
2. Stent, G. S, Richard Calender, Molecular Genetics: An Introductory Narrative, W.H. Freeman and Co., 1978

ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE			
Subject Code	21CTCTN6100	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	30	Exam Hours	03
Credits– 03			

Course Objectives:

1. The course aims at imparting basic principles of thought process, reasoning and inferencing. Sustainability is at the core of Indian Traditional Knowledge Systems connecting society and nature.
2. Holistic life style of Yogic-science and wisdom capsules in Sanskrit literature are also important in modern society with rapid technological advancements and societal disruptions.
3. The course focuses on introduction to Indian Knowledge System, Indian perspective of modern scientific world-view and basic principles of Yoga and holistic health care system

Unit -1: Introduction to Traditional Knowledge	**Hours**
Define Traditional Knowledge- Nature and Characteristics- Scope and Importance-kinds of Traditional Knowledge- The historical impact of social change on Traditional Knowledge Systems- Value of Traditional knowledge in global economy.	**06**
Unit-2: Basic structure of Indian Knowledge System	
AstadashVidya- 4 Ved - 4 Upaved (Ayurved, Dhanurved, GandharvaVed & SthapthyaAdi), 6 vedanga (Shisha, Kalppa, Nirukha, Vykaran, Jyothisha & Chand),4 upanga(Dharmashastra, Meemamsa, purana & Tharka Shastra).	**06**
Unit–3: Modern Science and Indian Knowledge System	
Indigenous Knowledge, Characteristics- Yoga and Holistic Health care-case studies.	**06**
Unit–4: Protection of Traditional Knowledge	
The need for protecting traditional knowledge - Significance of Traditional knowledge Protection-Role of government to harness Traditional Knowledge	**06**
Unit–5: Impact of Traditions	
Philosophical Tradition (Sarvadarshan) Nyaya, Vyshepec, Sankhya, Yog, Meemamsa, Vedantha, Chavanka, Jain &Boudh - Indian Artistic Tradition - Chitrakala, Moorthikala, Vasthukala , Sthapthya, Sangeetha, NruthyaYevamSahithya	**06**

Text(T) / Reference(R) Books:	
T1	Traditional Knowledge System in India, by Amit Jha, 2009.
T2	Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, PratibhaPrakashan 2012.
T3	Sivaramakrishnan (Ed.), Cultural Heritage of India-course material, BharatiyaVidya
R1	Swami Jitatmanand, Holistic Science and Vedant, BharatiyaVidyaBhavan
R2	Yoga Sutra of Patanjali, Ramakrishna Mission, Kolkata
	Web Links: 1.https://www.youtube.com/watch?v=LZP1StpYEPM 2.http://nptel.ac.in/courses/121106003/ 3.https://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_21/wipo_grtkf_ic_21_ref_facilitators_text.pdf

Course Outcomes: On completion of this course, students can	
CO1	Identify the concept of Traditional knowledge and its importance.
CO2	Classify the Indian Traditional Knowledge
CO3	Compare Modern Science with Indian Traditional Knowledge system.
CO4	Analyze the role of Government in protecting the Traditional Knowledge
CO5	Understand the impact of Philosophical tradition on Indian Knowledge System.

INTELLECTUAL PROPERTY RIGHTS

Subject Code	21CACAN3100	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 00

	Hours
Unit -1:	
Introduction: Introduction to Intellectual property, types of intellectual property, importance of intellectual property rights, agencies Responsible for Intellectual property Registration, Regulatory – Compliance and Liability Issues.	08
Unit -2:	
Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, Transfer of Rights, protectable matter, selecting and evaluating trade mark, Registrations of Trade Marks, Claims. **Trade Secrets:** Determination of trade secret status, liability for misappropriations of trade secrets, protection for submission.	10
Unit – 3:	
Copy rights: Fundamental of copy right, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, notice of copy right. **Patents:** introduction, patent searching process, ownership rights and transfer	10
Unit – 4:	
Cyber Law – Information Technology Act – Cyber Crime and E-commerce – Data Security – Confidentiality – Privacy – International aspects of Computer and Online Crime.	10
Unit – 5:	
New development of Intellectual Property: Emerging trends in trade mark; copy rights, patent, International overview on intellectual property.	12

Text(T) / Reference(R) Books:

T1	Intellectual property right, Deborah, E. Bouchoux, cengage learning.
T2	Cyber Law. Text & Cases, South-Western's Special Topics collections
T3	R. Radha Krishnan, S. Balasubramanian: "Intellectual Property Rights", Excel Books, New Delhi
R1	A short course in International Intellectual Property Rights – Karla C. Shippey, World Trade Press – 2 nd Edition
R2	Intellectual Property Rights: N K Acharya: ISBN: 9381849309

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CST

COURSE STRUCTURE

SITE 21

REGULATIONS

For

Computer Science and Technology

With effective from the Academic Year 2020-21

SITE21 Regulations

COURSE STRUCTURE for B. Tech. (CST)

Semester I (First year I -I)

S.No	Subject Code	Course	Hours			Credits
			L	T	P	
1	21CMMAT1010	Engineering Mathematics- I	3	0	0	3
2	21CTPHT1020	Engineering Physics	3	0	0	3
3	21CMCHT1030	Engineering Chemistry	3	0	0	3
4	21CMCTT1040	Programming for Problem Solving	3	0	0	3
5	21CTMEL1050	Computer Aided Engineering Graphics	2	0	2	3
6	21CTPHL1060	Engineering Physics Lab	0	0	3	1.5
7	21CMCHL1070	Engineering Chemistry Lab	0	0	3	1.5
8	21CMCTL1080	Programming for Problem Solving Lab	0	0	3	1.5
9	21CMESN1090	Constitution of India, Professional Ethics & Human Rights	2	0	0	0
		Total Credits				**19.5**

Semester II (First year I -II)

S.No	Subject Code	Course	Hours			Credits
			L	T	P	
1	21CMEGT2010	Technical English	3	0	0	3
2	21CMMAT2020	Engineering Mathematics - II	3	0	0	3
3	21CMEET2030	Basic Electrical Engineering	3	0	0	3
4	21CMCTT2040	Python Programming	3	0	0	3
5	21CTCTT2050	Data Structures	3	0	0	3
6	21CMEGL2060	English Communication Skills Lab	0	0	3	1.5
7	21CMEEL2070	Basic Electrical Engineering Lab	0	0	3	1.5
8	21CTCTL2080	Data Structures Lab	0	0	3	1.5
9	21CMMSN2090	Environmental Science	2	0	0	0
		Total Credits				**19.5**

Semester III (Second year II-I)

S. No	Code	Course Title	Hours			Credits
			L	T	P	
1	21CMMAT3010	Probability Distributions & Statistical Methods	3	0	0	3
2	21CTECT3020	Analog & Digital Electronics	3	0	0	3
3	21CTCTT3030	Computer Organization	3	0	0	3
4	21CTCTT3040	Java Programming	3	0	0	3
5	21CTCTT3050	Data Base Management Systems	3	0	0	3
6	21CTCTL3060	Analog &Digital Electronics Lab	0	0	3	1.5
7	21CTCTL3070	Java Programming Lab	0	0	3	1.5
8	21CTCTL3080	Data Base Management Systems Lab	0	0	3	1.5
9	21CTCTS3090	Data Science Using Python	0	0	3	2
10	21CTMSN3100	Biology for Engineers	2	0	0	0
					Total Credits	**21.5**

Semester IV (Second year II-II)

S.No	Code	Course Title	Hours			Credits
			L	T	P	
1	21CMMAT4010	Discrete Mathematics	3	0	0	3
2	21CTMST4020	Engineering Economics& Financial Management	3	0	0	3
3	21CTCTT4030	Operating systems	3	0	0	3
4	21 CTCTT4040	Design and Analysis of Algorithms	3	0	0	3
5	21 CTCTT4050	Software Engineering	3	0	0	3
6	21CTCTL4060	Operating systems Lab	0	0	3	1.5
7	21CTCTL4070	Design and Analysis of Algorithms Lab	0	0	3	1.5
8	21CTCTL4080	Software Engineering Lab	0	0	3	1.5
9	21CTCTS4090	MEAN Stack Technologies	2	0	0	2
					Total Credits	**21.5**

Semester V (Third Year III-I)

S. No	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	PC	21CTCTT5010	Automata Theory& Compiler Design	3	0	0	3
2	PC	21CTCTT5020	Computer Networks	3	0	0	3
3	PC	21CTCTT5030	Data Warehousing and Mining	3	0	0	3
4	PE-I	21CTCTP504X	Professional Elective -I	3	0	0	3
5	OE-I	21CTXXO505X	Open Elective - I	3	0	0	3
6	PC	21CTCTL5060	Computer Networks lab	0	0	3	1.5
7	PC	21CTCTL5070	Data Warehousing and Mining Lab	0	0	3	1.5
8	SOC	21CMAHS5080	**Skill Oriented Course** Soft Skills & Aptitude Builder - 1	1	0	2	2
9	MC	21CTCTN5090	Intellectual Property Rights	2	0	0	0
Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester)				0	0	0	1.5
						Total credits	**21.5**
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4

Category	Credits
Professional core Courses	12
Professional Elective courses	3
Open Elective Course	3
Skill oriented course	2
Summer Internship	1.5
Total Credits	**21.5**

Professional Elective - I	
Code	**Course Title**
21CTCTP504A	Software Testing
21CTCTP504B	Artificial Intelligence
21CTCTP504C	Distributed Systems
21CTCTP504D	Software Project Management

Semester VI (Third year III-II)

S. No	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	PC	21CTCTT6010	Machine Learning	3	0	0	3
2	PC	21CTCTT6020	Devops	3	0	0	3
3	PC	21CTCTT6030	Unified Modelling Language	3	0	0	3
4	PE-I	21CTCTP604X	Professional Elective -II	3	0	0	3
5	OE-II	21CTXXO605X	Open Elective Course	3	0	0	3
6	PC	21CTCTL6060	Machine Learning Lab	0	0	3	1.5
7	PC	21CTCTL6070	Devops Lab	0	0	3	1.5
8	PC	21CTCTL6080	Unified Modelling Language Lab	0	0	3	1.5
9	SOC	21CMAHS6090	**Skill Oriented Course** Soft Skills & Aptitude Builder - 2	1	0	2	2
10	MC	21CTCTN6100	**Mandatory course** Essence of Indian Traditional Knowledge	2	0	0	0
						Total credits	**21.5**
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4

Category	Credits
Professional core courses	13.5
Professional Elective courses	3
Open Elective Course	3
Skill-oriented course/ soft skill course*	2
Mandatory course (AICTE)	0
Total Credits	**21.5**

Professional Elective - II	
Code	**Course Title**
21CTCTP604A	Software Quality Assurance
21CTCTP604B	Cyber Security
21CTCTP604C	Design Patterns
21CTCTP604D	Block-chain Technology

Semester VII (Fourth year IV-I)

S. No	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	PE	21CTCTP701X	Professional Elective -III	3	0	0	3
2	PE	21CTCTP702X	Professional Elective - IV	3	0	0	3
3	PE	21CTCTP703X	Professional Elective - V	3	0	0	3
4	OE-III	21CTXXO704X	Open Elective Course	3	0	0	3
5	OE-IV	21CTXXO705X	Open Elective Course	3	0	0	3
6	HS	21CTMST7060	Management Science	0	0	3	3
7	SOC	21CTCTS7070	**Skill Oriented Course** ETL Spark	1	0	2	2
	Summer Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester)			0	0	0	3
						Total credits	**23**
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4

Professional Elective - III	
Code	**Course Title**
21CTCTP701A	Big Data Analytics
21CTCTP701B	Network Programming
21CTCTP701C	Mobile Computing

Professional Elective - IV	
Code	**Course Title**
21CTCTP702A	Soft Computing
21CTCTP702B	Human Computer Interaction
21CTCTP702C	Computer Vision

Professional Elective - V	
Code	**Course Title**
21CTCTP703A	Deep Learning
21CTCTP703B	Data Visualization
21CTCTP703C	Wireless Network Security

Semester VIII (Fourth year IV-II)

S. No	Category	Code	Course Title	Hours			Credits
				L	T	P	
1	PR	21CTCTR8010	Project	0	0	12	12
						Total credits	**12**

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS SEMESTER - I/I			
Subject Code	21CMMSN1090	IA Marks	30
Number of Lecture Hours/Week	03	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit - I	
Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**Hours – 10**
Unit - II	
Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**Hours – 10**
Unit – III	
State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**Hours – 10**
Unit –IV	
Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	**Hours – 10**
Unit – V	
Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**Hours – 10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity & Reliability

QUESTION PAPER PATTERN:

1. It will have 5 questions with internal choice.
2. Each question carries 14 marks.
3. Each full question comprises sub questions covering all topics under a unit.

TEXT BOOKS:

1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn., 2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma, **"Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

ENVIRONMENTAL SCIENCE			
Subject Code	21CMCHN1090/2090	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Acquire knowledge on global environmental challenges.
2. Learn different types of natural resources
3. Create awareness on biodiversity and ecology.
4. Gain scientific knowledge on environmental pollution
5. Acquire knowledge on water conservation methods and environmental legislation

Module -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Role of Information Technology in Environment and human health.	**Hours – 6**
Module -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Floods, drought, , dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: Effects of modern agriculture - fertilizer-pesticide problems, water logging, eutrophication, biological magnification and salinity. Energy resources: Renewable and non-renewable energy resources Role of an individual in conservation of natural resources.	**Hours –6**
Module – 3	
ECOSYSTEM AND BIODIVERSITY **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the Forest and grassland ecosystem. **Biodiversity** - Introduction - Definition: genetic, species and ecosystem diversity. – Value of biodiversity: consumptive use, productive use, social, ethical and optional values - Hot-spots of	**Hours –8**

biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
Module – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Noise pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution.	**Hours –6**
Module – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act .	**Hours –6**
COURSE OUTCOMES: On completion of the course student will be able to 1. Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion. 2. Preserve several natural resources 3. Summarize the concept of ecosystem 4. Control different types of pollution 5. Understand social issues and environmental legislation	
QUESTION PAPER PATTERN: 1. Question paper consists of 10 questions. 2. Each full question carrying 14 marks. 3. Each full question will have sub question covering all topics under a unit. 4. The student will have to answer 5 full questions selecting one full question from each unit.	
TEXT BOOKS: 1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi. 2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi. 3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi	

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeksha Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. Environmental Studies, P.N. Palaniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

BIOLOGY FOR ENGINEERS			
Subject Code	18CMBIT5010	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 03			

Unit -1: Introduction	**Hours**
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology. How biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermo dynamics by referring to the original observation of Robert Brown and Julius Mayor.	**08**
Unit -2:Classification	
Plant Hierarchy of life forms at phenomenological level- classification based on (a) cellularity - Unicellular or multicellular (b) ultra- structure- prokaryotes or eukaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotrophs (d) Ammonia excretion – ammoniotelic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms for the study of biology come from different groups. E. coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**08**
Unit – 3:Genetics & Biomolecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics. **Molecules of life:** Monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	**12**
Unit – 4:Enzymes& Proteins	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions - Enzyme classification. Mechanism of enzyme action. -examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. **Proteins-** structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. **Information Transfer:** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of	**12**

genetic code. Define gene in terms of complementation and recombination	
Unit – 5:Microbiology& Metabolism	
Thermodynamics as applied to biological systems - Exothermic and endothermic versus undergone and exergoinc reactions. Concept of K_{eq} and its relation to standard free energy - Spontaneity - ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms.** Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	10

Text(T) / Reference(R) Books:	
T1	Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
T2	Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
T3	Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers
R1	Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
R2	Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
W1	https://ocw.mit.edu/courses/biological-engineering/
W2	https://onlinecourses.nptel.ac.in/noc16_ge03/preview

Course Outcomes: On completion of this course, students can	
CO1	Describe how biological observations of 18th Century that lead to major discoveries.
CO2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"

Course Outcomes to Program Outcomes Mapping: (1: Low, 2: Medium, 3: High)

	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	2	3	-	-	-	-	-	2	-
CO3	1	-	-	-	-	3		-	-	-	-	-	1	-
CO4	3	-	-	-	-		2	-	-	-	-	-	1	-
CO5	2	-	-	-	-	3		-	-	-	-	-	1	-
Course	1	-	-	-	-	3	2	-	-	-	-	-	1	-

INTELLECTUAL PROPERTY RIGHTS

Subject Code	21CACAN3100	IA Marks	30
Number of Lecture Hours/Week	3	Exam Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 00

Unit -1:	Hours
Introduction: Introduction to Intellectual property, types of intellectual property, importance of intellectual property rights, agencies Responsible for Intellectual property Registration, Regulatory – Compliance and Liability Issues.	08
Unit -2:	
Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, Transfer of Rights, protectable matter, selecting and evaluating trade mark, Registrations of Trade Marks, Claims. **Trade Secrets:** Determination of trade secret status, liability for misappropriations of trade secrets, protection for submission.	10
Unit – 3:	
Copy rights: Fundamental of copy right, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, notice of copy right. **Patents:** introduction, patent searching process, ownership rights and transfer	10
Unit – 4:	
Cyber Law – Information Technology Act – Cyber Crime and E-commerce – Data Security – Confidentiality – Privacy – International aspects of Computer and Online Crime.	10
Unit – 5:	
New development of Intellectual Property: Emerging trends in trade mark; copy rights, patent, International overview on intellectual property.	12

Text(T) / Reference(R) Books:

T1	Intellectual property right, Deborah, E, Bouchoux, cengage learning.
T2	Cyber Law. Text & Cases, South-Western's Special Topics collections
T3	R. Radha Krishnan, S. Balasubramanian: "Intellectual Property Rights", Excel Books, New Delhi
R1	A short course in International Intellectual Property Rights – Karla C. Shippey, World Trade Press – 2 nd Edition
R2	Intellectual Property Rights: N K Acharya: ISBN: 9381849309

ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE			
Subject Code	21CTCTN6100	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	30	Exam Hours	03
Credits– 03			

Course Objectives:

1. The course aims at imparting basic principles of thought process, reasoning and inferencing. Sustainability is at the core of Indian Traditional Knowledge Systems connecting society and nature.
2. Holistic life style of Yogic-science and wisdom capsules in Sanskrit literature are also important in modern society with rapid technological advancements and societal disruptions.
3. The course focuses on introduction to Indian Knowledge System, Indian perspective of modern scientific world-view and basic principles of Yoga and holistic health care system

Unit -1: Introduction to Traditional Knowledge	**Hours**
Define Traditional Knowledge- Nature and Characteristics- Scope and Importance-kinds of Traditional Knowledge- The historical impact of social change on Traditional Knowledge Systems- Value of Traditional knowledge in global economy.	**06**
Unit-2: Basic structure of Indian Knowledge System	
AstadashVidya- 4 Ved - 4 Upaved (Ayurved, Dhanurved, GandharvaVed & SthapthyaAdi), 6 vedanga (Shisha, Kalppa, Nirukha, Vykaran, Jyothisha & Chand),4 upanga(Dharmashastra, Meemamsa, purana & Tharka Shastra).	**06**
Unit–3: Modern Science and Indian Knowledge System	
Indigenous Knowledge, Characteristics- Yoga and Holistic Health care-case studies.	**06**
Unit–4: Protection of Traditional Knowledge	
The need for protecting traditional knowledge - Significance of Traditional knowledge Protection-Role of government to harness Traditional Knowledge	**06**
Unit–5: Impact of Traditions	
Philosophical Tradition (Sarvadarshan) Nyaya, Vyshepec, Sankhya, Yog, Meemamsa, Vedantha, Chavanka, Jain &Boudh - Indian Artistic Tradition - Chitrakala, Moorthikala, Vasthukala , Sthapthya, Sangeetha, NruthyaYevamSahithya	**06**

Text(T) / Reference(R) Books:	
T1	Traditional Knowledge System in India, by Amit Jha, 2009.
T2	Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, PratibhaPrakashan 2012.
T3	Sivaramakrishnan (Ed.), Cultural Heritage of India-course material, BharatiyaVidya
R1	Swami Jitatmanand, Holistic Science and Vedant, BharatiyaVidyaBhavan
R2	Yoga Sutra of Patanjali, Ramakrishna Mission, Kolkata
	Web Links: 1.https://www.youtube.com/watch?v=LZP1StpYEPM 2.http://nptel.ac.in/courses/121106003/ 3.https://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_21/wipo_grtkf_ic_21_ref_facilitators_text.pdf

Course Outcomes: On completion of this course, students can	
CO1	Identify the concept of Traditional knowledge and its importance.
CO2	Classify the Indian Traditional Knowledge
CO3	Compare Modern Science with Indian Traditional Knowledge system.
CO4	Analyze the role of Government in protecting the Traditional Knowledge
CO5	Understand the impact of Philosophical tradition on Indian Knowledge System.

REGULATIONS, COURSE STRUCTURE AND SYLLABUS

For

I & II B.Tech.

Electronics and Communication Technology

With effective from the Academic Year

2021-2022

sasi autonomous INSTITUTE OF TECHNOLOGY & ENGINEERING

...Values We Live...

Accredited by NAAC with "A" Grade
Recognised by UGC under section 2(f) &12(B)
Approved by AICTE - New Delhi
Permanently Affiliated to JNTUK, SBTET
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Department of Electronics & Communication Technology

Course Structure for SITE21

Course Structure for I B.Tech ECT Under the Regulations of SITE-21

Semester -I

S.No	Course Code	Subject Code	Course	L	T	P	C
1	BS	21CMMAT1010	Engineering Mathematics - I	3	0	0	3
2	BS	21ETPHT1020	Engineering Physics	3	0	0	3
3	BS	21CMCHT1030	Engineering Chemistry	3	0	0	3
4	ES	21CMCST1040	Programming for Problem Solving	3	0	0	3
5	ES	21ETMEL1050	Computer aided Engineering Graphics	2	0	2	3
6	BS LAB	21ETPHL1060	Engineering Physics Lab	0	0	3	1.5
7	BS LAB	21CMCHL1070	Engineering Chemistry Lab	0	0	3	1.5
8	ES LAB	21CMCSL1080	Programming for Problem Solving Lab	0	0	3	1.5
9	MC	21CMMSN1090	Constitution of India, Professional Ethics & Human Rights	2	0	0	0
			TOTAL				**19.5**

Course Structure for I B.Tech ECT Under the Regulations of SITE-21

Semester -II

S.No	Course Code	Subject Code	Course	L	T	P	C
1	HS	21CMEGT2010	Technical English	3	0	0	3
2	BS	21CMMAT2020	Engineering Mathematics - II	3	0	0	3
3	ES	21CMEET2030	Basic Electrical Engineering	3	0	0	3
4	ES	21CMCST2040	Python Programming	1	0	4	3
5	ES	21ETETT2050	Network Analysis	3	0	0	3
6	HS LAB	21CMEGL2060	English Communication Skills Lab	0	0	3	1.5
7	ES LAB	21CMEEL2070	Basic Electrical Engineering Lab	0	0	3	1.5
8	ES LAB	21ETMEL2080	Engineering Workshop Lab	0	0	3	1.5
9	MC	21CMCHN2090	Environmental Science	2	0	0	0
			TOTAL				**19.5**

Course Structure for II B.Tech ECT Under the Regulations of SITE-21

Semester -III

S.No	Course Code	Subject Code	Course	L	T	P	C
1	BS	21ECMAT3010	Engineering Mathematics - III	3	0	0	3
2	BS	21ETETT3020	Probability Theory & Stochastic Processes	3	0	0	3
3	PC	21ETETT3030	Semiconductor Devices	3	0	0	3
4	PC	21ETETT3040	Digital System Design	3	0	0	3
5	PC	21ETETT3050	Signals & Systems	3	0	0	3
6	PC	21ETETL3060	Semiconductor Devices Lab	0	0	3	1.5
7	PC	21ETETL3070	Digital System Design Lab	0	0	3	1.5
8	PC	21ETETL3080	Electrical circuits Lab	0	0	3	1.5
9	SOC	21ETETS3090	Skill Oriented Course –I (Data Science Using Python) **OR** (MATLAB FOR Engineers)	1	0	2	2
			TOTAL				**21.5**

Course Structure for II B.Tech ECT Under the Regulations of SITE-21

Semester -IV

S.No	Course Code	Subject Code	Course	L	T	P	C
1	PC	21ETETT4010	Management Science	3	0	0	3
2	PC	21ETETT4020	EM Waves & Transmission Lines	3	0	0	3
3	PC	21ETETT4030	Principles of Communication Theory	3	0	0	3
4	PC	21ETETT4040	Electronic Circuit Analysis	3	0	0	3
5	HS	21CMMST4050	Control Systems	3	0	0	3
6	PC	21ETETL4060	Principles of Communication. Lab	0	0	3	1.5
7	PC	21ETETL4070	Electronic Circuit Analysis Lab	0	0	3	1.5
8	PC	21ETETL4080	Signals and systems Lab	0	0	3	1.5
9	SOC	21ETETS4090	Skill Oriented Course -2 (Internet of Things (IOT)) **OR** (PCB Designing)	1	0	2	2

10	MC	21ETETN40A0	Pulse and Digital Circuits	2	0	0	0
Total							**21.5**
11		21ETETHXXX 21ETETMXXX	Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also	4	0	0	4

Semester V (Third year)

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ECECT5010	Digital Modulation and Coding	3	0	0	3
2	21ECECT5020	Radiation Systems	3	0	0	3
3	21ECECT5030	Linear IC Applications	3	0	0	3
4	21ECECP504X	Professional Elective-1	3	0	0	3
5	21ECXXO505X	Open Elective - 1	3	0	0	3
6	21ECECL5060	Digital Modulation and Coding Lab	0	0	3	1.5
7	21ECECL5070	Linear IC Applications Lab	0	0	3	1.5
8	21ECECS5080	Skill advanced course/ soft skill course-3* (Soft Skills & Aptitude Builder-1).	1	0	2	2
10	21ECECN5090	Biology for Engineers	2	0	0	0
10	21ECECR70A0	Summer Internship - 2 Months (Mandatory) after second year (to beevaluated during V semester	0	0	3	1.5
Total Semester Credits						**21.5**
11		Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

Professional Elective-I

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ETETP504A	Computer Organization and Microprocessors	3	0	0	3
2	21ETETP504B	Data Communications	3	0	0	3
3	21ETETP504C	System Design through Verilog	3	0	0	3

III B.Tech VI Semester

S.No	Subject Code	Name of the subject	L	T	P	C
1	21ETETT6010	Digital Signal Processing	3	0	0	3
2	21ETETT6020	Data Communications and Networking	3	0	0	3
3	21ETETT6030	Microcontrollers and Applications	3	0	0	3
4	21ETETP604X	Professional Elective-II	3	0	0	3
5	21ETXXO605X	Open Elective - II	3	0	0	3
6	21ETETL6060	Digital Signal Processing Lab	0	0	3	1.5
7	21ETETL6070	VLSI Design Lab	0	0	3	1.5
8	21ETETL6080	Microcontroller and Applications Lab	0	0	3	1.5
9	21ETETS6090	Skill advanced course/ soft skill course-4* Soft Skills and Aptitude Builder-2	1	0	2	2
10	21ETETN60A0	Essential of Indian Traditional Knowledge	2	0	0	0
		Total Semester Credits				**21.5**
11	H/M	Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

Professional Elective-2

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ETETP604A	Spread Spectrum Techniques	3	0	0	3
2	21ETETP604B	Advanced VLSI Design	3	0	0	3
3	21ETETP604C	Microwave Engineering	3	0	0	3

IV B.Tech VII Semester

S.No	Subject Code	Name of the subject	L	T	P	C
1	21ETETP701X	Professional Elective -III	3	0	0	3
2	21ETETP702X	Professional Elective -IV	3	0	0	3
3	21ETETP703X	Professional Elective -V	3	0	0	3
4	21ETXXO704X	Open Elective - III	3	0	0	3
5	21ETXXO705X	Open Elective - IV	3	0	0	3
6	21ETXXO706X	Humanities and Social Science Elective	3	0	0	3
7	21ETETS707A	Skill Advanced Course (Microwave Circuits and Antenna Design using HFSS)	1	0	2	2
	21ETETS707B	Skill Advanced Course (Deep Learning for Image Processing Applications)				
8	21ETETR7080	Research Internship - 2 Months (Mandatory) after Third year (to be	0	0	6	3

		evaluated during V semester				
					Total Semester Credits	**23**
9	H/M	Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4

Professional Elective-3

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ETETP701A	Digital Image Processing	3	0	0	3
2	21ETETP701B	Telecommunications and Switching Networks	3	0	0	3
3	21ETETP701C	CAD Tools for VLSI	3	0	0	3

Professional Elective-4

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ETETP702A	Bio-Medical Signal Processing	3	0	0	3
2	21ETETP702B	Global Position Systems	3	0	0	3
3	21ETETP702C	Optical Communication	3	0	0	3

Professional Elective-5

S.No	Subject Code	Name of the subject	L	T	P	Cr
1	21ETETP703A	RF System Design	3	0	0	3
2	21ETETP703B	Internet of Things	3	0	0	3
3	21ETETP703C	Radar and Satellite Communications	3	0	0	3

Course Structure for IV B. Tech ECT Under the Regulations of SITE-21

Semester -VIII

S. No	Subject Code	Name of the subject	L	T	P	C
1	XXXXXX	Project work, seminar and internship in industry	0	0	24	12

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS (Common to all Branches) SEMESTER I			
Subject Code	21CMMSN1090	IA Marks	30
Number of Lecture Hr/week	03	Exam Marks	70
Total Number of Lecture Hr	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit - I	**Hours**
Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	**10**
Unit - II	
Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	**10**
Unit – III	
State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	**10**
Unit –IV	
Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	**10**
Unit – V	
Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	**10**

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative

Societies, and

5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity & Reliability

Question paper pattern:

1 Question paper consists of 10 questions.
2 Each full question carrying 14 marks.
3 Each full question will have sub question covering all topics under a unit.
4 The student will have to answer 5 full questions selecting one full question from each unit.

TEXT BOOKS:

1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn., 2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

ENVIRONMENTAL SCIENCE			
Subject Code	21CMCHN1090/2090	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Acquire knowledge on global environmental challenges.
2. Learn different types of natural resources
3. Create awareness on biodiversity and ecology.
4. Gain scientific knowledge on environmental pollution
5. Acquire knowledge on water conservation methods and environmental legislation

Module -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Role of Information Technology in Environment and human health.	**Hours – 6**
Module -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Floods, drought, , dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: Effects of modern agriculture - fertilizer-pesticide problems, water logging, eutrophication, biological magnification and salinity. Energy resources: Renewable and non-renewable energy resources Role of an individual in conservation of natural resources.	**Hours –6**
Module – 3	
ECOSYSTEM AND BIODIVERSITY **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the Forest and grassland ecosystem. **Biodiversity** - Introduction - Definition: genetic, species and ecosystem diversity. – Value of biodiversity: consumptive use, productive use, social, ethical and optional values - Hot-spots of	**Hours –8**

biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
Module – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution c. Soil pollution d. Noise pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution.	**Hours –6**
Module – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act .	**Hours –6**
COURSE OUTCOMES: On completion of the course student will be able to 1. Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion. 2. Preserve several natural resources 3. Summarize the concept of ecosystem 4. Control different types of pollution 5. Understand social issues and environmental legislation	
QUESTION PAPER PATTERN: 1. Question paper consists of 10 questions. 2. Each full question carrying 14 marks. 3. Each full question will have sub question covering all topics under a unit. 4. The student will have to answer 5 full questions selecting one full question from each unit.	
TEXT BOOKS: 1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi. 2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi. 3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi	

REFERENCE BOOKS:

1. Text Book of Environmental Studies by Deeksha Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. Environmental Studies, P.N. Palaniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.

MANAGEMENT SCIENCE
(Common to ECE,CSE,ECT,IT& EEE)
SEMESTER IV

Subject Code	21CMMST4010	Internal Marks	30
Number of Lecture Hours/Week	03	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03

Credits – 03

Course objectives:
This course will enable the students to

- Understand the concepts of Management its nature & importance, Management theories and organization principles.
- Analyze the Work study, SQC, inventory management and its techniques.
- Learn various concepts like PERT, CPM and Project crashing and recent trends in management.

Unit -I	**Hours**
Introduction to Management: Concept –nature and importance of Management – Functions of Management – Evaluation of Management thought- Theories of Motivation – Decision making process-Designing organization structure- Principles of organization - Types of organization structure.	**10**
Unit –II	
Operations Management: Principles and Types of Layouts – Work study- Statistical Quality Control- Control charts (P-chart, R-chart, and C chart). Simple problems- Material Management: Need for Inventory control- EOQ, ABC analysis (simple problems) and Types of ABC analysis (HML, SDE, VED, and FSNanalysis).	**10**
Unit-III	
Functional Management&Strategic Management: **Functional Management**: Concept of HRM, HRD and PMIR- Functions of HRM - Marketing Management- Functions of Marketing, Marketing strategiesbasedonproductLifeCycle,Channelsofdistributions. **Strategic Management**: Vision, Mission, Goals, Strategy – Elements of Corporate Planning Process – Environmental Scanning – SWOT analysis- Steps in Strategy Formulation and Implementation, Generic Strategy alternatives	**12**
Unit –IV	
Project Management: **(PERT/CPM):** Development of Network – Difference between PERT and CPM Identifying Critical Path- Probability- Project Crashing (Simple Problems).	**10**
Unit-V	
Contemporary Management Practices: Basic concepts of MIS, MRP, Justin- Time (JIT) system, Total Quality Management (TQM), Six sigma , Supply ChainManagement, Enterprise Resource Planning (ERP), Business Process outsourcing (BPO), Business process Re-engineering and Bench Marking, Balanced ScoreCard.	**08**

Course outcomes:

On completion of the course student will be able to:

1. Execute the functions of Management, Principles of Management & Leadership styles.
2. Examine Statistical Quality Control Techniques, Methods of inspection, the concept of Inventory Management and Control
3. Predict the Customer Behaviour and Employees Contribution towards success of Organization.
4. Identify different Strategies for the Development of the Organization.
5. Analyze Project Management Techniques like CPM, PERT and Crashing.
6. Apply various contemporary issues in Management Practices like TQM, Business Process Reengineering and BPO etc.

Question paper pattern:

Section A:

1. This section contains ten one or two line answer question carrying 1 mark each.
2. Two questions from each unit should present.

Section B:

1. This Section will have 10 questions, 2 from each unit
2. Each full question carry 12 marks.
3. Each full question will have sub question covering all topics under a unit.
4. The student will have to answer 5 full questions selecting one full question from each unit

Text Books:

1. Dr. A. R. Aryasri – Management Science, TMH 2011.
2. Dr. P.G.Ramanujam,Dr. B.V.R.Naidu and Prof. P.V.Rama Sastry: Management Science, Himalaya Publishing House 2013.

Reference Books:

1. Koontz & Weihrich: 'Essentials of Management' TMH 2011.
2. Seth & Rastogi: Global Management Systems, Cengage Learning, Delhi, 2011.
3. Robbins: Organizational Behaviors, Pearson Publications, 2011

Web References:

1. https://www.managementstudyguide.com/management_principles.htm
2. https://businessjargons.com/strategic-management.html

Course Outcomes to Program Outcomes mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
4	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
6	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Course	-	-	-	-	**1**	**1**	-	-	**3**	-	**2**	-	-	-	-

S.No.	Unit Name	Text Book Reference	Chapter No.
1	Introduction to Management	T1	1 & 3
		T2	1
2	Operations Management	T1	7,8,10&15
		T2	2
3	Functional Management&Strategic Management	T1	11,12 &14
		T2	3 & 5
4	Project Management: (PERT/CPM)	T1	16 & 17
		T2	4
5	Contemporary Management Practices	T1	20
		T2	8

Soft Skills & Aptitude builder - 1 SEMESTER - V			
Subject Code	21CMAHS5080	**IA Marks**	**15**
Number of Lecture Hours/Week	**2**	**Exam Marks**	**35**
Total Number of Lecture Hours	**32**	**Exam Hours**	**3**
Credits - 2			

Unit – 1A: Intrapersonal Communication	**Hours**
Introduction to Soft Skills and its significance **Personal Effectiveness**: Who am I and What am I: My strengths and weaknesses, SWOT analysis; SMART Goal Setting, Being Proactive **Principles of Personal Vision**: Beginning with the end in mind Time management: Understanding priorities: put first-things-first **Activity**: Psychometric tests and SWOT analysis, SMART goal setting	**6**
Unit 2A: Interpersonal Communication	
Principles of Creative Cooperation and Organisation Skills: Think win-win; Seek first to understand then to be understood; Synergize; Life-long learning **Emotional Intelligence**: Self-awareness, self-regulation, Empathy, Assertiveness, Adoptability, Managing emotions **Activity**: Resolving a conflict with your friend, colleague, or a family member; Group discussions & Debates	**5**
Unit – 3A: 21st Century Skills	
What are 21st century skills? Learning skills- Digital literacy- Life skills **Critical Thinking**: Active listening, Observation, Introspection, Analytical thinking, Open mindedness **Problem Solving**: Understanding the complexity of the problem, defining the problem, cause and effect analysis, exploring possible solutions, planning actions, analysing results of your actions, getting feedback, redefining the problem, The problem solving cycle **Decision Making**: Managing conflict, conflict resolution, methods of decision making, effective decision making in teams – methods & styles **Activity**: Case study	**5**

Section-A: Text (T) / Reference (R) Books:	
T1	**English and Soft Skills, Dr. S. P. Dhanvel, Orient Blackswan, 2011**
R1	**Seven Habits of Highly Effective People, Stephen R Covey**
R2	**Emotional Intelligence, Daniel Goleman, Bantom Book, 2006**
R3	**21st Century Skills: Learning for Life in our Times, Bernie Trilling, Charles Fadel; John Wiley & Sons**

Course Outcomes: On completion of this course, students can	
Section A: Soft Skills	
CO 1	**re-engineer attitude and understand its influence on behaviour**
CO 2	**develop interpersonal skills and be an effective goal oriented team player**
CO 3	**develop holistic personality with a mature outlook to function effectively in different circumstances**

Course Outcomes to Programs Outcomes Mapping: (1: Low, 2: Medium, 3: High)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	-	-	-	-	-	-		1	-	3	-	-	-
2	-	-	-	-	-	-	-	-	2	1	-	3	-	-	-
3	-	-	-	-	-	-	-	-	1	1	-	3	-	-	-
4	-	-	-	-	-	-	-	-	-		-	-	-	-	-
5	-	-	-	-	-	-	-	-	-		-	-	-	-	-
Course	-	-	-	-	-	-	-	-	-		-	-	-	-	-

Soft Skills & Aptitude Builder - 2			
Subject Code	21ETETS6090	**IA Marks**	**15+15**
Number of Lecture Hours/Week	**2**	**Exam Marks**	**35+35**
Total Number of Lecture Hours	**32**	**Exam Hours**	**3**
Credits - 2			

Unit – 1: Communicative Competence	**Hours**
Verbal Reasoning: Reading Comprehension-Text Completion- Sentence EquivalenceSpotting Errors, Sequencing of Sentences, Parallelism in Structure E-Mail Etiquette, Reporting NewsActivity: Completing Exercises	6
Unit 2: Career and Employability Skills	
What is a Career: Career vs Job, Career Values & Grid, Skills vs Strengths, Spotting Skills/Reflection of Present Skills, Meeting the Expectation of your Employer, Matching your Skills with the Required Skills, Preparing Resume, Preparing for Interviews & Structuring Answers Activity: Resume Building, Interviews	6
Section B,Aptitude Builder	
Unit – 3: Time and Work	
Pipes and Cisterns: Problems on Unitary method, Relation between Men, Days, Hours and Work, Problems on Man-Day-Hours Method, Problems on Alternate Days, Problems on Pipes and Cisterns. **Time , Distance and Speed, Problems on Trains, Boats and Streams:** Relation between Speed, Distance and Time, Converting km/h into m/s and vice versa , Problems on Average Speed, Problems on Relative Speed, Problems on Circular Tracks, Problems on Races **Problems on Trains:** Two Trains Moving in Opposite Direction, Two Trains Moving in same Direction, A Train Crossing a Stationary Object of a Given Length like a Platform or Bridge, A Train Crossing a Stationary Object like a Pole or a Man **Boats and Streams:** Time Based, which can be considered as a Point Object Speed Based, Distance Based, Average Speed Based	6
Unit – 4: Logical and Analytical Reasoning	
Seating Arrangement: Linear Arrangement, Circular Arrangement, Tabler, Triangular Arrangement, Complex Arrangement. **Clocks :** Finding the Angle When the Time is Given, Finding the Time When the Angle is Known, Relation between Angles, Minutes and Hours, Position of Hands of the Clock, Time Gained or Lost by the Clock, Mirror /Water Image-based Time. **Calendars :** Definition of a Leap Year, Finding the Number of Odd Days, Framing the Year Code for Centuries, Finding the Day of any Random Calendar Date **Syllogisms:** Finding the Conclusions using Venn Diagram Method, Finding the Conclusions using Syllogism Method **Simple Interest:** Definitions, Problems on Interest and Amount, Problems when Rate of Interest and Time Period are Numerically Equal **Compound Interest:** Definition and Formula for Amount in Compound Interest,	7

Difference between Simple Interest and Compound Interest for 2 Years on the Same Principle and Time Period.	
Unit – 5: Permutations, Probability, Areas and Volumes	
Definition of permutation , Problems on Permutations , Definition of Combinations , problems on Combinations **Probability:** Definition of Probability, Problems on Coins, Problems on Dice, Problems on Deck of Cards , Problems on Years **Mensuration - 2D:**Formulas for Areas, Formulas for Volumes of Different Solids, Problems on Areas **Mensuration - 3D:** Problems on Volumes, Problems on Surface Areas	7

Text (T) / Reference (R) Books:	
For Units 1 & 2	
T1	**Enhance Your Employability Skills, David Winter and Laura Brammar, University of London**
T2	**R.S. Agarwal, Verbal & Non-Verbal Reasoning, S. Chand & Co., Latest ed. 2003**
R2	**How to Prepare for Verbal Ability and Reading Comprehension, Arun Sharma, Meenakshi Upadhay, Mc Graw Hill**
For Units 3, 4, & 5	
T1	R S Agarwal, S Chand, 'Quantitative Aptitude'
T2	R S Agarwal, S.Chand , 'A modern approach to Logical reasoning'
R1	Quantitative Aptitude for CAT By Arun sharma
R2	GL Barrons, Mc Graw Hills, Thorpe's verbal reasoning, LSAT Materials
Course Outcomes: On completion of this course, students can	
Section A: Soft Skills	
CO 1	**learn and practice effective communication skills**
CO 2	**develop broad career plans, evaluate the employment market, and become industry ready**
Section B: Aptitude Builder	
CO 3	**develop accuracy on time and distance and units related solutions**
CO 4	**solve the real-time problems for performing job functions easily**
CO 5	**solve problems related to permutations and combinations, probability, areas and volumes**

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KAIML

COURSE STRUCTURE AND DETAILED SYLLABUS

SITE 21 REGULATIONS

for

Artificial Intelligence and Machine Learning

With Effective from the academic year 2021-22

sasi INSTITUTE OF TECHNOLOGY & ENGINEERING
autonomous
Accredited by NAAC with "A" Grade
Recognised by UGC under section 2(f) &12(B)
Approved by AICTE - NEW Delhi
Permanently Affiliated to JNTUK, SBTET
Ranked as "A" Grade by Govt. of A.P.
Department of Artificial Intelligence & Machine Learning

Course Structure for I B.Tech AIML Under the Regulations of SITE-21							
Semester -I							
S.No	Course Code	Subject Code	Course	L	T	P	C
1	HS	21CMMAT1010	Engineering Mathematics – I	3	0	0	3
2	BS	21AMPHT1020	Engineering Physics	3	0	0	3
3	ES	21CMCHT1030	Engineering Chemistry	3	0	0	3
4	ES	21CMCST1040	Programming for Problem Solving	3	0	0	3
5	ES	21AMMEL1050	Computer Aided Engineering Graphics	2	0	2	3
6	HS	21AMPHL1060	Engineering Physics Lab	0	0	3	1.5
7	ES	21CMCHL1070	Engineering Chemistry Lab	0	0	3	1.5
8	ES	21CMCSL1080	Programming for Problem Solving Lab	0	0	3	1.5
9	MC	21CMMSN1090	Constitution of India, Professional Ethics & Human Rights	2	0	0	0
TOTAL				**16**	**0**	**11**	**19.5**

Course Structure for I B.Tech AIML Under the Regulations of SITE-21							
Semester -II							
S.No	Course Code	Subject Code	Course	L	T	P	C
1	BS	21CMEGT2010	Technical English	3	0	0	3
2	BS	21CMMAT2020	Engineering Mathematics - II	3	0	0	3
3	BS	21CMEET2030	Basic Electrical Engineering	3	0	0	3
4	ES	21CMCST2040	Python Programming	1	0	4	3
5	ES	21AMAMT2050	Data Structures	3	0	0	3
6	BS	21CMEGL2060	English Communication Skills Lab	0	0	3	1.5
7	BS	21CMEEL2070	Basic Electrical Engineering Lab	0	0	3	1.5
8	ES	21AMAML2080	DS Lab	0	0	3	1.5
9	MC	21CMCHN2090	Environmental Science	2	0	0	0
TOTAL				**16**	**0**	**11**	**19.5**

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Proposed Course Structure for II B.Tech AIML Under the Regulations of SITE-21

Semester -III

S.No	Subject Code	Course Code	Course	L	T	P	C
1	BS	21AMMAT3010	Probability and statistics	3	0	0	3
2	PC	21AMAMT3020	Foundations of Artificial Intelligence	3	0	0	3
3	PC	21AMAMT3030	Database Management Systems	3	0	0	3
4	PC	21AMAMT3040	Operating Systems	3	0	0	3
5	PC	21AMAMT3050	Analog &Digital Electronics	3	0	0	3
6	PC	21AMAMT3060	Artificial Intelligence Lab	0	0	3	1.5
7	PC	21AMAMT3070	Operating Systems Lab	0	0	3	1.5
8	PC	21AMAMT3080	Database Management Systems Lab	0	0	3	1.5
9	SOC	21AMAMC3090	Python for Data Science	1	0	2	2
10	MC	21CMBIN3100	MC: Biology for Engineers	3	0	0	0
			TOTAL				**21.5**

Proposed Course Structure for II B.Tech AIML Under the Regulations of SITE-21

Semester -IV

S. No	Subject Code	Course Code	Course	L	T	P	C
1	BS	21AMMAT4010	Discrete Mathematics	3	0	0	3
2	PC	21AMAMT4020	Introduction to Machine Learning	3	0	0	3
3	PC	21AMAMT4030	Design and Analysis of Algorithms	3	0	0	3
4	ES	21AMAMT4040	Java Programming	3	0	0	3
5	PC	21AMAMT4050	Optimization Techniques for AI	3	0	0	3
6	PC	21AMAML4060	Machine Learning Lab	0	0	3	1.5
7	PC	21AMAML4070	Design and Analysis of Algorithms Lab	0	0	3	1.5
8	ES	21AMAML4080	Java Programming Lab	0	0	3	1.5
9	SOC	21AMAMC4090	SOC: Fundamentals of Programming and Simulation using MATLAB for AI	1	0	2	2
			TOTAL				**21.5**
Internship 2 Months (Mandatory) during summer vacation							

Proposed Course Structure for III B.Tech AIML Under the Regulations of SITE-21							
Semester -V							
S. No	Subject Code	Course Code	Course	L	T	P	C
1	HSS	21CMMST5010	Engineering Economics & Financial Management	3	0	0	3
2	PC	21AMAMT5020	Computer Networks	3	0	0	3
3	PC	21AMAMT5030	Software Engineering	3	0	0	3
4	PE	21AMAMT504X	Professional Elective-1	3	0	0	3
5	OE	21AMXXT5050	Open Elective-1	3	0	0	3
6	PC	21AMAML5060	Computer Networks Lab	0	0	3	1.5
7	PC	21AMAML5070	Software Engineering Lab	0	0	3	1.5
8	SOC	21CMAHS5080	Soft Skills & Aptitude builder I	1	0	2	2
9	MC	21AMAMN5090	MC: Intellectual Property Rights	2	0	0	0
10		21AMAMR5100	Summer Internship (Mandatory) after second year (to be evaluated during V semester	0	0	0	1.5
			TOTAL				**21.5**
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4

Professional Electives I

S.No.	Course Code	Course
1.	21AMAMT504A	Graph Theory
2.	21AMAMT504B	Web Programming
3.	21AMAMT504C	Computer Vision & Robotics
4.	21AMAMT504D	Computer Graphics

Proposed Course Structure for III B.Tech AIML Under the Regulations of SITE-21							
Semester -VI							
S.No	Subject Code	Course Code	Course	L	T	P	C
1	BS	21AMAMT6010	Deep learning	3	0	0	3
2	BS	21AMAMT6020	Compiler Design	3	0	0	3
3	PC	21AMAMT6030	Natural Language Processing	3	0	0	3
4	PC	21AMAMT604X	Professional Elective -2	3	0	0	3
5	PC	21AMAMT6050	Open Elective -2	3	0	0	3
6	PC	21AMAMT6060	Deep learning Lab	0	0	3	1.5
7	PC	21AMAMT6070	Compiler Design Lab	0	0	3	1.5
8	PC	21AMAMT6080	Natural Language Processing Lab	0	0	3	1.5
9	SOC	21AMAMC6090	Soft Skills & Aptitude builder II	2	0	0	2
10	MC	21AMAMC6100	Mandatory Course : Essence of Indian Traditional Knowledge	2	0	0	0
			TOTAL				**21.5**

Professional Electives II

S.No.	Course Code	Course
1.	21AMAMT604A	Software Testing Methodologies
2.	21AMAMT604B	Information Retrieval Systems
3.	21AMAMT604C	Cryptography and Network Security
4.	21AMAMT604D	Pattern Recognition

Proposed Course Structure for IV B.Tech AIML Under the Regulations of SITE-21

Semester -VII

S.No	Subject Code	Course Code	Course	L	T	P	C
1	PC	21AMAMT701X	Professional Elective-3	3	0	0	3
2	PC	21AMAMT702X	Professional Elective-4	3	0	0	3
3	PC	21AMAMT703X	Professional Elective-5	3	0	0	3
4	PC	21AMXXT704X	Open Elective-3	3	0	0	3
5	PC	21AMXXT705X	Open Elective-4	3	0	0	3
6	HS	21AMMST7060	Management Science	3	0	0	3
7	SOC	21AMAMC7070	Skill Oriented Course	1	0	2	2
		21AMAMR7080	Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester	0	0	0	3
			TOTAL				**23**

Professional Electives III

S.No.	Course Code	Course
1.	21AMAMT701A	**Internet of Things**
2.	21AMAMT701B	Reinforcement Learning
3.	21AMAMT701C	DevOps
4.	21AMAMT701D	Block Chain Technologies

Professional Electives IV

S.No.	Course Code	Course
1.	21AMAMT702A	Robotic Process Automation
2.	21AMAMT702B	Expert Systems
3.	21AMAMT702C	Big Data Analytics
4.	21AMAMT702D	Soft Computing

Professional Electives V

S.No.	Course Code	Course
1.	21AMAMT703A	Cloud Computing
2.	21AMAMT703B	Data Mining & Data Warehousing
3.	21AMAMT703C	AI chatbots
4.	21AMAMT703D	Semantic Web

Proposed Course Structure for IV B.Tech AIML Under the Regulations of SITE-21							
Semester -VIII							
S.No	Subject Code	Course Code	Course	L	T	P	C
1	PC	21AMMAT5010	Project Work	3	0	0	12
			TOTAL				**12**

Open Electives: (Offered by AI&ML Department for other department students)

S. No	Subject Code	Name of the subject	L	T	P	C
1.	21XXAMOXXXA	Artificial Intelligence	3	0	0	3
2.	21XXAMOXXXB	Operating Systems Concepts	3	0	0	3
3.	21XXAMOXXXC	Designing Database Management Systems	3	0	0	3
4.	21XXAMOXXXD	R Programming	3	0	0	3
5.	21XXAMOXXXE	Java Programming	3	0	0	3
6.	21XXAMOXXXF	Introduction to Machine Learning	3	0	0	3
7.	21XXAMOXXXG	Internet of Things	3	0	0	3
8.	21XXAMOXXXH	Optimization Techniques for AI	3	0	0	3

Minor Courses

S.No	Course Code	Name of the Course	L	T	P	C
1	21YYAMMXXXX	Soft Computing	3	1	0	4
2	21YYAMMXXXX	Introduction to AI & Machine Learning	3	1	0	4
3	21YYAMMXXXX	Introduction to Data Science	3	1	0	4
4	21YYAMMXXXX	Deep Learning	3	1	0	4
5	21YYAMMXXXX	IOT	3	1	0	4
6	21YYAMMXXXX	EXPERT SYSTEMS	3	1	0	4
		Total Credits (Any 4 Courses)				16

NOTE:

- TWO, NPTEL courses of minimum 12-week duration covering a total of 4 credits (offered by AI & ML Department) should be completed, Student can register at any time after the completion of II B.Tech. I Sem.

CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS (Common to all Branches) SEMESTER I			
Subject Code	21CMMSN1090	IA Marks	30
Number of Lecture Hr/week	03	Exam Marks	70
Total Number of Lecture Hr	50	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course help the students to

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

Unit - I	Hours
Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.	10
Unit - II	
Directive Principles of State Policy & Relevance of Directive Principles State Policy Fundamental Duties. Union Executives – President, Prime Minister Parliament Supreme Court of India.	10
Unit – III	
State Executives – Governor, Chief Minister, State Legislature High Court of State. Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th, 86th &91st Amendments.	10
Unit –IV	
Special Provision for SC & ST Special Provision for Women, Children & Backward Classes Emergency Provisions. Human Rights –Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India Powers and functions of Municipalities, Panchyats and Co - Operative Societies.	10
Unit – V	
Scope & Aims of Engineering Ethics, Responsibility of Engineers Impediments to Responsibility. Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering.	10

COURSE OUTCOMES:

On completion of the course student will

1. Have general knowledge and legal literacy and thereby to take up competitive examinations.
2. Understand state and central policies, fundamental duties.
3. Understand Electoral Process, special provisions.
4. Understand powers and functions of Municipalities, Panchayats and Co-operative

Societies, and
5. Understand Engineering ethics and responsibilities of Engineers
6. Understand Engineering Integrity & Reliability

Question paper pattern:

1 Question paper consists of 10 questions.
2 Each full question carrying 14 marks.
3 Each full question will have sub question covering all topics under a unit.
4 The student will have to answer 5 full questions selecting one full question from each unit.

TEXT BOOKS:

1. Durga Das Basu: **"Introduction to the Constitution on India",** (Students Edn.) Prentice – Hall EEE, 19th / 20th Edn., 2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **"Engineering Ethics"** Thompson Asia, 2003-08-05.

REFERENCE BOOKS:

1. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. M.Govindarajan, Natarajan, V.S.Senthilkumar, **"Engineering Ethics",** Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
3. Brij Kishore Sharma,**" Introduction to the Constitution of India"**, PHI Learning Pvt. Ltd., New Delhi, 2011.
4. Latest Publications of Indian Institute of Human Rights, New Delhi

ENVIRONMENTAL SCIENCE Semester II			
Subject Code	21CMCHN2090	IA Marks	30
Number of Lecture Hours/Week	2	Exam Marks	70
Total Number of Lecture Hours	32	Exam Hours	03
Credits – 00			

COURSE OBJECTIVES:

The objectives of this course, help the students to

1. Acquire knowledge on global environmental challenges.
2. Learn different types of natural resources
3. Create awareness on biodiversity and ecology.
4. Gain scientific knowledge on environmental pollution
5. Acquire knowledge on water conservation methods and environmental legislation

Module -1	
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES **Environment** - Definition, Introduction - Scope and Importance - Global environmental challenges, global warming & climate change - Acid rains, ozone layer depletion - Role of Information Technology in Environment and human health.	**Hours – 6**
Module -2	
NATURAL RESOURCES Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use, deforestation - Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Floods, drought, , dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: Effects of modern agriculture - fertilizer-pesticide problems, water logging, eutrophication, biological magnification and salinity. Energy resources: Renewable and non-renewable energy resources Role of an individual in conservation of natural resources.	**Hours –6**
Module – 3	
ECOSYSTEM AND BIODIVERSITY **Ecosystem** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the Forest and grassland ecosystem. **Biodiversity** - Introduction - Definition: genetic, species and ecosystem diversity. – Value of biodiversity: consumptive use, productive use, social, ethical and optional values - Hot-spots of biodiversity - Threats to biodiversity: habitat loss - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**Hours –8**
Module – 4	
ENVIRONMENTAL POLLUTION Definition, Cause, effects and control measures of : a. Air pollution b. Water pollution	**Hours –6**

c. Soil pollution d. Noise pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution.	
Module – 5	
SOCIAL ISSUES AND THE ENVIRONMENT Urban problems related to energy -Water conservation, rain water harvesting, Resettlement and rehabilitation of people its problems and concerns. Environment Protection Act - Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act - Forest Conservation Act .	**Hours –6**
COURSE OUTCOMES: On completion of the course student will be able to 1. Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion. 2. Preserve several natural resources 3. Summarize the concept of ecosystem 4. Control different types of pollution 5. Understand social issues and environmental legislation	
QUESTION PAPER PATTERN: All questions should be answered, each question carries 14 marks	
TEXT BOOKS: 1. E. Bharucha (2003), "Environmental Studies", University Publishing Company, New Delhi. 2. J.G. Henry and G.W. Heinke (2004), "Environmental Science and Engineering", Second Edition, Prentice Hall of India, New Delhi. 3. G.M. Masters (2004)" Introduction to Environmental Engineering and Science", Second Edition, Prentice Hall of India, New Delhi	
REFERENCE BOOKS: 1. Text Book of Environmental Studies by Deeksha Dave & P. Udaya Bhaskar, Cengage Learning. 2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada. 3. Environmental Studies, P.N. Palaniswamy, P. Manikandan, A. Geeta and K. Manjula Rani, Pearson Education, Chennai.	

BIOLOGY FOR ENGINEERS SEMESTER – VI			
Subject Code	**21CMBIT6100**	Internal Marks	30
Number of Lecture Hours/Week	2	External Marks	70
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 0			

Course Objectives:

This course will enable students to:

1. To convey that Biology is as important a scientific discipline as Mathematics, Physics and Chemistry
2. To convey that classification per se is not what biology is all about. The underlying criterion, such as morphological, biochemical or ecological be highlighted.
3. To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"
4. To convey that all forms of life has the same building blocks and yet the manifestations are as diverse as one can imagine
5. To convey that without catalysis life would not have existed on earth
6. The molecular basis of coding and decoding genetic information is universal

Unit -1 Introduction	
Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology? Discuss how biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor. These examples will highlight the fundamental importance of observations in any scientific inquiry	**Hours – 12**
Unit -2 Classification	
Hierarchy of life forms at phenomenological level. A common thread weaves this hierarchy Classification. Discuss classification based on (a) cellularity- Unicellular or multicellular (b) ultra structure- prokaryotes or eucaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophy, lithotropes (d) Ammonia excretion – aminotelic, uricoteliec, ureotelic (e) Habitata- acquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. A given organism can come under different category based on classification. Model organisms for the study of biology come from different groups. E.coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. Musculus	**Hours – 10**
Unit – 3 Genetics & Bio molecules	
Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics.	**Hours – 10**

Molecules of life: In this context discuss monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	
Unit – 4 Enzymes & Information Transfer Purpose	
Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions? Enzyme classification. Mechanism of enzyme action. Discuss at least two examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis. Information Transfer Purpose: The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosides. Concept of genetic code. Universality and degeneracy of genetic code. Define gene in terms of complementation and recombination	**Hours – 10**
Unit – 5 Microbiology & Metabolism	
Macromolecular analysis Purpose: How to analyses biological processes at the reductionistic level Proteins- structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements. Thermodynamics as applied to biological systems. Exothermic and endothermic versus endergonic and exergoinc reactions. Concept of Keq and its relation to standard free energy. Spontaneity. ATP as an energy currency. This should include the breakdown of glucose to CO2 + H2O (Glycolysis and Krebs cycle) and synthesis of glucose from CO2 and H2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge **Concept of single celled organisms**. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics	**Hours – 8**
Course outcomes: On successful completion of this course, students are able 1. Describe how biological observations of 18th Century that lead to major discoveries. 2. Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological 3. Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring 4. Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine 5. Classify enzymes and distinguish between different mechanisms of enzyme action.	
Text Books: 1. Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd, 2020 2. Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons, 2006	
Reference Books: 1. Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company, 2017	

2. Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher
Online resources: 1. https://onlinecourses.nptel.ac.in/noc19_ge31/preview

1.3.1
MS

COURSE STRUCTURE AND DETAILED SYLLABUS

for
Master of Business Administration
(MBA)

Effective from the academic year 2021-2022

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Department of Management Science

Credit Distribution for MBA Program

S.No.	Category	No. of Credits	
		Suggested by AICTE	Proposed
1.	Core Courses	54	75
2.	Electives	42	32
3.	Project work/ Internship & Mini Project	06	05
Total Credits		**102**	**112**

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MBA I Semester Course structure for the Academic Year 2021-2022

S. No	Subject Code	Title of the Course	T	L	C	Internal	External	Total
1.	21MS01T1	Principles of Management	4	-	4	40	60	100
2.	21MS01T2	Managerial Economics	4	-	4	40	60	100
3.	21MS01T3	Accounting for Managers	4	-	4	40	60	100
4.	21MS01T4	Managerial Communication & Soft Skills	4	-	4	40	60	100
5.	21MS01T5	Quantitative Analysis for Business Decisions	4	-	4	40	60	100
6.	21MS01T6	Business Environment	4	-	4	40	60	100
7.	21CS01L7	Information Technology Lab	-	3	2	40	60	100
8.	21MS01C8	Case Study – I	2	-	1	-	-	-
Total Credits for I Semester (A)					**27**	**280**	**420**	**700**

MBA II Semester Course structure for the Academic Year 2021-2022

S. No	Subject Code	Title of the Course	T	L	C	Internal	External	Total
1.	21MS02T1	Financial Management	4	-	4	40	60	100
2.	21MS02T2	Marketing Management	4	-	4	40	60	100
3.	21MS02T3	Human Resource Management	4	-	4	40	60	100
4.	21MS02T4	Production & Operations Management	4	-	4	40	60	100
5.	21MS02T5	Research Methodology	4	-	4	40	60	100
6.	21MS02T6	Organisational Behaviour	4	-	4	40	60	100
7.	21MS02P7	Mini Project	2	-	2	-	-	100
8.	21MS02C8	Case Study – II	2	-	1	-	-	-
Total Credits for II Semester (B)					**27**	**240**	**360**	**700**

MBA III Semester Course structure for the Academic Year 2021-2022

S. No	Subject Code	Title of the Course	T	L	C	Internal	External	Total
1.	21MS03T1	Strategic Management	4	-	4	40	60	100
2.	21MS03T2	Legal Aspects of Business	4	-	4	40	60	100
3.	21MS03T3	Business Ethics & Corporate Governance	4	-	4	40	60	100
4.	21MS03F4/ M4/H4	Elective – I	4	-	4	40	60	100
5.	21MS03F5/ M5/H5	Elective – II	4	-	4	40	60	100
6.	21MS03F6/ M6/H6	Elective – III	4	-	4	40	60	100
7.	21MS03F7/ M7/H7	Elective – IV	4	-	4	40	60	100
8.	21MS03B8	Startup Business Plan	2	-	1	-	-	-
Total Credits for III Semester (C)					**29**	**280**	**420**	**700**

The students may choose **ONE** Specialization among the following:

Subject code	Finance	Subject code	Marketing	Subject Code	HR
21MS03F4	Security Analysis & Portfolio Management	21MS03M4	Consumer Behaviour	21MS03H4	Leadership Management
21MS03F5	Banking & Insurance Management	21MS03M5	Retail Management	21MS03H5	Compensation and Reward Management
21MS03F6	Project Management	21MS03M6	Customer Relationship Management	21MS03H6	Performance Management
21MS03F7	Strategic Financial Management	21MS03M7	Digital & Social Media Marketing	21MS03H7	Strategic Human Resource Management

MBA IV Semester Course structure for the Academic Year 2021-2022

S. No	Subject Code	Title of the Course	T	L	C	Internal	External	Total
1.	21MS04T1	Logistics & Supply Chain Management	4	-	4	40	60	100
2.	21MS04T2	Entrepreneurship Development	4	-	4	40	60	100
3.	21MS04F3/M3/H3	Elective – V	4	-	4	40	60	100
4.	21MS04F4/M4/H4	Elective – VI	4	-	4	40	60	100
5.	21MS04F5/M5/H5	Elective – VII	4	-	4	40	60	100
6.	21MS04/F6/M6/H6	Elective – VIII	4	-	4	40	60	100
7.	21MS04P7	Internship/Project and Viva Voce	-	-	5	-	-	100
Total Credits for IV Semester (D)					**29**	**240**	**360**	**700**

The students may choose **ONE** Specialization among the following:

Subject Code	Finance	Subject Code	Marketing	Subject code	HR
21MS04F3	Financial Markets & Services	21MS04M3	Services Marketing	21MS04H3	Global HRM
21MS04F4	Global Financial Management	21MS04M4	Promotion & Distribution Management	21MS04H4	Organizational Development and Change Management
21MS04F5	Financial Risk Management	21MS04M5	Global Marketing Management	21MS04H5	Labour Welfare Legislation
21MS04F6	Tax Management	21MS04M6	Rural Marketing	21MS04H6	Management of Industrial Relations

Number of Credits for each semester:

SEMESTER	CREDITS
I	27
II	27
III	29
IV	29
TOTAL	**112**

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MANAGERIAL ECONOMICS			
Subject Code	21MS01T2	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	04	Exam Hours	03

Credits – 04

COURSE OBJECTIVES:

- To outline the basic concepts of Economics pertinent to business Decision Making
- To familiarise the various concepts of Managerial Economics
- To illustrate the various market structures and price determination in various markets.

Unit -1	
Introduction to Managerial Economics: Definition, Nature and Scope, Relationship with other areas in Economics, The role of managerial economist. Concept of opportunity cost, Incremental concept, time Perfective, Discounting Principle, Risk & uncertainty.	**Hours – 10**
Unit -2	
Demand Analysis: Elasticity of demand, types and significance of Elasticity of Demand - Measurement of price Elasticity of Demand – Need for Demand forecasting, forecasting techniques, Law of Supply.	**Hours – 10**
Unit – 3	
Production Analysis: Production functions, Production function with one/two variables, Marginal Rate of Technical Substitution, Cobb-Douglas Production Function, Returns to Scale and Laws of returns.	**Hours – 10**
Unit – 4	
Cost theory and Estimation: Cost concepts, Opportunity Cost, Fixed Cost vs. Variable Cost, Explicit vs. Implicit Cost Determinants of cost, cost - output relationship in the short run and long run –, Short – run Average cost curves – Average total cost Curve – Cost - Volume – Profit analysis.	**Hours –10**
Unit – 5	
Market Structures and Pricing practices: Features and Types of different Markets – Price- Output determination in Perfect competition, Monopoly, Monopolistic competition and Oligopoly both in the long run and short run. Pricing methods in practice – Managerial Theories of a firm – Marris & Williams Models.	**Hours – 10**

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

COURSE OUTCOMES:

1. Students are experienced with various economic concepts
2. Students are aware the various concepts of Managerial Economics
3. Students are aware the various market structures and know the various price determination in each market structure

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

2. D.N. Dwivedi, Managerial Economics, 8th Edition, *Vikas Publishing House, 2015*
3. Dr. Atmanand , Managerial Economics, Excel Books, 2012
4. R.H. Dahlokia, A.N. Oza, Micro Economics for Management, *Oxford University Press,*
5. 1999.
6. Pual G. Keat, Philip K.Y. Young, Sreejata Benerjee, Managerial Economics, Economic Tools for Today's Decision Makers, *Pearson Education,* 2011.
7. Mark Hirshey & Bentzen, Managerial Economics, *Cengage International,* 2016.
8. Paul, Koushil: "**Managerial Economics**", Cengage Learning, New Delhi.
9. E. Narayana Nadar & S. Vijayan, Managerial Economics, *Prentice Hall of India,*
10. Vanita Agarwal, Managerial Economics, *Pearson Education, 2013*

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	-	3	-	-	-	-	-	-
2	-	-	-	2	-	-	-	-
3	-	-	-	-	-	2	-	-
4	-	-	-	-	2	-	-	-
5	-	-	-	-	3	-	-	-

3 – High; 2 – Medium; 1 – Low; 0 = No Matching

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PRINCIPLES OF MANAGEMENT			
Subject Code	**21MS11T1**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

COURSE OBJECTIVES:

- To Describe the development of Management Thought and its relevance to business
- To Demonstrate the concepts of Planning and Organising and their components.
- To Examine the various Directing and Controlling techniques.
- To Familiarize the various Decision Making Types and Models
- To Examine the various contemporary issues in Management

Unit –I	
Introduction of Management: Management: Definition – Importance – Managerial Roles – Functions of management – Evolution of Management Thought – Motivation Theories - Classical theory – Scientific management - Administrative theory – Behavioral Theory	**Hours – 10**
Unit –II	
Planning and Organizing: Nature and Definition of Planning – Principles of Planning – Objectives of planning – Planning process – Types of plans – Benefits and pitfalls of planning. Principles of organizing – Organization levels – Organizational designs and structure – Line and staff organizations – Approaches – Delegation of Authority – Factors affecting delegation of authority – Departmentation - Span of management – Centralization and decentralization of Authority.	**Hours – 10**
Unit – III	
Directing and Controlling: Definition of Co-ordination – Significance and principles of Coordination– Leadership behavior and styles – Leadership in cross cultural environment. Nature and importance of controlling – Controlling process – Requirements of effective control – Establishing controlling system – Controlling techniques.	**Hours – 10**
Unit – IV	
Decision making: Meaning of decision – types of decisions – Rationale decision making process – Models of decision making – Problem solving and decision making – increasing participation in decision making – Vroom"s Participative decision making model – challenges and problems in decision making	**Hours –10**

Unit – V	
Contemporary issues in Management: MBO - Management By Walking Around – Out of the Box Thinking – Balanced Score Card –Time Management – BPOs – Stress Management causes and remedies – JIT – TQM – Six Sigma – BPR.	**Hours – 10**
Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.	

COURSE OUTCOMES:

- Students are able to understand the development of management thought
- Clearly know the concepts of Planning, Organizing and their components.
- Understand the methods and techniques of Directing and Controlling
- Familiar with the various Decision Making tools.
- Know the various contemporary issues.

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)9398742717

REFERENCE BOOKS:

1. William, Tripathy: "**MGMT (including instructor recourses)**", Cengage Learning, New Delhi, 2013.
2. Harold Koontz, Heinz Weihrich, Essentials of Management, *McGraw Hill Education,* 2010.
3. ***P.Subba Rao, Management Theory & Organisational Behaviour, Text & Cases*** Himalaya Publishing House, New Delhi, 2012,
4. V.S.P. Rao, Management Text & Cases, Excel Books Second Edition, 2012
5. Peter F. Drucker, Management, Tasks, Responsibilities, Practices, *Routledge International*, 1978
6. Dr.P.Subba Rao and Prof. N.SambasivaRao:"**Management and Organizational Behaviour - (Text and Cases)**", Himalaya Publishing House, Mumbai.
7. Neeta Baporikar, Case Method – Cases in Management, Himalya Publishing House, 2009.

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	0	0	0	0	0	0	0
CO2	3	0	0	0	0	0	0	0
CO3	0	3	0	0	0	0	0	0
CO4	0	0	0	0	3	0	0	0
CO5	0	0	0	2	0	0	0	3

3 – High; 2 – Medium; 1 – Low; 0 = No Matching

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BUSINESS ENVIRONMENT			
Subject Code	**21MS11T6**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

COURSE OBJECTIVES:

- To understand the overview of business environment at National and International Level.
- To describe the overview of Indian Economy with Economic Reforms
- To familiarize the various policies of the Government of India pertaining to Indian Business
- To illustrate the Foreign Trade Policy of India with global perspective
- To describe the Legal framework of Government of India

Unit –I	
Business Environment: Importance at national and international level – problems and challenges – factors both internal and external influencing business environment. Industrial policies since independence and their significance – regulatory and promotional framework - Five-year plans and their importance.	**Hours – 10**
Unit –II	
Structure of Indian economy – Nature and significance – Economic systems – structure of Indian industry – Economic reforms in various sectors – nature – challenges – social justice – Disinvestment mechanism – problems and procedures – Sickness in Indian industry, competition Act 2002.	**Hours – 10**
Unit – III	
Fiscal Policy: nature and significance – public revenues – expenditure- debt, development activities allocation of funds – critical analysis of the recent fiscal policy of Government of India. Balance of Payments: Nature – structure – major components – causes for disequilibrium in balance of payments – correction measures.	**Hours – 10**
Unit – IV	
India's Trade Policy: Nature – Magnitude and direction of Indian international trade – problems – bilateral and multilateral trade agreements. International business environment: Nature – significance– challenges and mechanisms. WTO: Agreements in the Uruguay round including TRIPS, TRIMS and GATS – Disputes Settlement Mechanism – Dumping and Antidumping Measures.	**Hours –10**
Unit – V	
Legal Frame: special features of the SICA (special provisions) 1985, BIFR,	**Hours – 10**

Consumer protection act 1986, Environmental laws (pertaining to the control and prevention of Air and Water pollution) and the Essential Commodities Act 1955 Intellectual Property Rights Laws.	

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

COURSE OUTCOMES:

- Students are learned with the knowledge of business environment.
- Students are able to gain knowledge regarding fiscal policy, balance of payment, trade policies and consumer protection act-1986
- Ability to know the various components of Indian Economy
- Know the overview of Indian Foreign Trade Policy with global perspective.
- Understand the Legal framework of Government of India

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. ShaikhSaleem: "**Business Environment**", Pearsons, New Delhi,
2. VeenaKeshavPailwar: "**Economic Environment of Business**", PHI Learning, New Delhi, 2012
3. Aswathappa K: "**Essentials of Business Environment**", Himalaya Publishing House, New Delhi, 2011.
4. RuddarDutt& KPM Sundaram, Indian Economy, S.Chand Publishing
5. Faisal Ahmed, M.AbsarAlam, Business Environment, Indian & Global Perspective, *Prentice Hall of India, 2017, New Delhi*
6. Francis Cherunilam, Business Environment, Text & Cases, *Himalaya Publishing House, Mumbai, 2017.*
7. B.N.Ghosh, Business Environment, Oxford University Press, New Delhi, 2014.
8. Rosy Joshi, SangamKapoor: "**Business Environment**", Kalyani Publishers, New Delhi, 2011.

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	0	0	0	0	0	0	0	2
2	0	3	0	0	3	0	0	2
3	0	0	0	3	0	0	0	0
4	0	0	0	3	0	0	2	0
5	0	0	0	3	0	0	0	3

3 – High; 2 – Medium; 1 – Low; 0 = No Matching

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Department of Management Science

Syllabus- MBA II Semester for the Autonomous Batch starting from A.Y. 2021-2022

MARKETING MANAGEMENT			
Subject Code	**21MS12T2**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

COURSE OBJECTIVES:

- To describe the basic concepts of Marketing & discuss the Indian Marketing Environment
- To discuss the Segmenting, Targeting and Positioning Strategies of companies
- To understand the basics of Pricing strategy
- To describe the concept of Marketing Communication process and Communication Mix
- To describe the concept of Marketing Organisation and also discuss the various marketing controls

Unit –I	
Introduction to Marketing: Needs, Wants, Demands, Products, Exchange, Transactions, Market, Marketing, Production Concept, Product Concept, Sales Concept, Marketing Concept, Societal Marketing Concept, Societal Marketing Concept. Marketing Intelligence system, marketing decision system.	**Hours – 10**
Unit –II	
Market Segmentation and Targeting: Identification of Market Segments, - Consumer and Institutional/corporate Clientele - Segmenting Consumer Markets, Segmentation Basis, Selecting Target Markets, Segmentation and Targeting as a Basis for Strategy Formulation. Developing and Communicating a Positioning Strategy.	**Hours – 10**
Unit – III	
Product & Pricing Strategy: Levels of the Product – Product Line and Mix – Product Life Cycle. Objectives of Pricing, Methods of Pricing, Selecting the final price, Adopting price, initiating the price cuts, imitating price increases, responding to Competitor's price changes.	**Hours – 10**
Unit – IV	
Marketing Communication: the communication process, Communication mix, Managing advertising sales promotion, Public relations and Direct Marketing. Sales force Objectives, Sales force structure and size, Sales force Compensation.	**Hours –10**
Unit – V	
Marketing Organization and Control: Evolution of Marketing Department, Organizing the Marketing Department, Marketing Implementation, Control of Marketing Performance, Annual Plan Control, Profitability Control, Efficiency Control, Strategic Control.	**Hours – 10**

COURSE OUTCOMES:

- Ability to understand the basic concepts of Marketing & adhere the Indian

Marketing Environment

- Ability to understand the Segmenting, Targeting and Positioning Strategies
- Familiar the process of finalization of the prices of the production and know the various pricing strategies
- Understand the concept of Marketing Communication and communication mix
- Adhere the concept of Marketing orgnaisation and ability to understand the various marketing controls.

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. Phillip Kotler: "**Marketing Management** ", Pearson Publishers, New Delhi, 2013.
2. RajanSexena: "**Marketing Management**", Tata McGraw Hill, New Delhi, 2012.
3. R.Srinivasan: "**Case Studies in Marketing**", PHI Learning, New Delhi, 2012
4. V.S.RamaSwamy, S. Nama Kumari, Marketing Management, McGraw Hill, 2013
5. PingaliVenuGopal, Marketing Management A Decision Making Approach, *Response Books*, 2010.
6. Lamb, Hair, Sharma: "**MKTG**" Cengage Learning , New Delhi, 2013

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	0	1	0	3	0	0
CO2	0	2	0	0	0	3	0	0
CO3	0	2	0	0	0	3	0	0
CO4	0	2	0	2	0	3	0	0
CO5	0	2	0	0	0	3	0	0

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Syllabus- MBA II Semester for the Autonomous Batch starting from A.Y. 2021-2022

HUMAN RESOURCE MANAGEMENT			
Subject Code	**21MS12T3**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

COURSE OBJECTIVES:

- To describe the concept of Human Resource, HR functions & its implementation process in the firm.
- To familiarize the concept of Manpower Planning, Recruitment, Training and development and its methods and techniques
- To discuss the various Performance Evaluation Methods
- To familiarize the various Wage Concepts
- To describe the important aspects of Industrial Relations in organsiations.

Unit –I	
HRM: Significance - Definition and Functions – evolution of HRM- Principles - Ethical Aspects of HRM- - HR policies, Strategies to increase firm performance - Role and position of HR department –aligning HR strategy with organizational strategy - HRM at global perspective- challenges – cross-cultural problems – emerging trends in HRM.	**Hours – 10**
Unit –II	
Investment perspectives of HRM: HR Planning –demand and supply forecasting - Recruitment and Selection- sources of recruitment - Tests and Interview Techniques - Training and Development – methods and techniques– training evaluation - retention - Job Analysis – job description and specifications. Management development - HRD concepts – mechanisms – career planning and counseling.	**Hours – 10**
Unit – III	
Performance Evaluation: Importance – methods – traditional and modern methods – Latest trends in performance appraisal - Career Development and Counseling- Compensation, Concepts and Principles- Influencing Factors- Current Trends in Compensation- Methods of Payments - compensation mechanisms at international level.	**Hours – 10**
Unit – IV	
Wage and Salary Administration: Concept- Wage Structure- Wage and Salary Policies- Legal Frame Work- Determinants of Payment of Wages- Wage Differentials - Job design and Evaluation- - Incentive Payment Systems. Welfare management: Nature and concepts – statutory and non-statutory welfare measures – incentive mechanisms.	**Hours –10**
Unit – V	
Managing Industrial Relations: Trade Unions-Employee Participation	**Hours – 10**

Schemes-Collective Bargaining–Grievances and disputes resolution mechanisms. –Safety at work – nature and importance – work hazards – safety mechanisms - Managing work place stress. HR accounting and auditing: Nature and significance –problems – HR audit - process – HRIS - methods.	

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

COURSE OUTCOMES:

- Able to understand the concept of Human Resource Management.
- Students able to understand the concept of Manpower Planning, Recruitment and Training development
- Ability to understand the various methods and techniques of Performance Evaluation.
- Students are able to understand the wage concepts
- Ability to understand the important actors in Industrial Relations.

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. K Aswathappa: "***Human Resource and Personnel Management***", Tata McGraw Hill, New Delhi, 2013
2. Subba Rao P: "***Personnel and Human Resource Management-Text and Cases***", Himalaya Publications, Mumbai, 2013.
3. N.Sambasiva Rao and Dr. Nirmal Kumar: "**Human Resource Management and Industrial Relations**", Himalaya Publishing House, Mumbai
4. Mathis, Jackson,Tripathy:"***Human Resource Management:Asouth-Asin Perspective***", Cengage Learning, New Delhi, 2013
5. Jayant Mukherjee, Designing Human Resource Management Systems, A Leader's Guide, *Sage International*
6. Garry Dessler, Human Resource Management, 12th Edition, *Pearson Education,*

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	1	0	0	0	3	0	0
CO2	0	2	0	0	0	3	0	0
CO3	0	2	0	0	0	3	0	0
CO4	0	0	0	0	0	3	0	0
CO5	0	0	0	0	0	3	0	0

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Syllabus- MBA II Semester for the Autonomous Batch starting from A.Y. 2021-2022

ORGANISATIONAL BEHAVIOUR			
Subject Code	**21MS12T6**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

Course Objectives

- To demonstrate the key concepts of Organisational Behaviour
- To describe the Perception, Motivation and Leadership concept
- To analyse the various Leadership skills and significance of Groups
- To familiarize the various Team Building techniques and conflict resolutions in teams and groups.
- To describe the concepts Organizational Culture, Design and Development

Unit – I	
Introduction - Nature and scope – linkages with other social sciences - Individual Roles and Organizational Goals - Perspectives of Human Behavior, Approach to Organizational behavior - models of organizational behavior.	**10 hours**
Unit – II	
Perceptual Management: Nature - Process – selection, organization and interpretation – Influencing factors -Motivation – Concepts - Needs and Motives and theories. Leadership and Motivating people - Leadership Theories. Attitudes and Values: formation - Types – Changes and Behavior Modification Techniques.	**10 hours**
Unit – III	
Personality Development: Nature - Stages, Determinants of Personality, - Johari Window - Transactional Analysis, Learning Processes - Theories, Creativity and Creative - Thinking. Leadership nature and skills. - Decision Making Process: Behavioral Dimensions, Groups and their formation - Group Dynamics, Informal Organizations, Group versus Individual Interaction.	**10 hours**
Unit – IV	
Inter-Personal Communication: Listening, Feedback, Collaborative Processes in Work Groups, Team Building, Team Decision Making, Conflict Resolution in Groups and Problem Solving Techniques.	**10 hours**
Unit – V	
Organizations: Determinants of Structure, Functional Aspects of Structure,. Principles and Design of Organizations, Organizational Culture, Power and Authority. Stress in Organization. Organizational Development processes, Change – Resistance to Change.- Interventions, OD techniques and applications.	**`10 hours**

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

COURSE OUTCOMES:

- Understand the principles and concept of organisational behaviour
- Understand the concepts of Perception, Leadership and Motivation
- Familiar with the various Leadership skills and know the importance of Groups

- Understand the various team building techqniques and also familiar with conflict resolution concept.
- Familiar the concepts of Organizational Culture, Design and Development

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

Reference Books

1. K.Aswathappa: "Organizational Behavior-Text, Cases and Games", Himalaya Publishing House, New Delhi, 2008,
2. Jai B.P.Sinha: "Culture and Organizational Behavior", Sage Publication India Private Limted, New Delhi, 2008.
3. P. Subba Rao, Organizational Behaviour, Himalaya Publishing House, 2009, Mumbai
4. Steven L McShane, Mary Ann Von Glinow, Radha R Sharma: "Organizational Behavior", Tata McGraw Hill Education, New Delhi, 2008.
5. Jerald Greenberg and Robert A Baron: "Behavior in Organizations", PHI Learning Private Limited, New Delhi, 2009.
6. PareekUdai: "Understanding Organizational Behavior", Oxford University Press, New Delhi, 2007.
7. John W. New Strom, Keith A. Davis, Organisational Behaviour: Human Behaviour at Work, *McGraw Hill Higher Education,* 2001.

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	3	-	-	-	-	-	-	2
2	-	-	-	-	3	-	-	-
3	-	3	-	-	-	-	-	-
4	-	-	-	-	3	-		-
5	-	-	-	-		-	-	2

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Syllabus- MBA III Semester for the Autonomous Batch starting from A.Y. 2021-2022

STRATEGIC MANAGEMENT			
Subject Code	**21MS13T1**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

COURSE OBJECTIVES:

- To enable students have a grasp basic concepts of Strategic Management
- To discuss the importance of Environmental Scanning in Strategic formulation
- To give a snapshot on strategy formulation framework.
- To describe procedures, considerations in strategy implementation process
- To explain the significant procedures in Strategy Evaluation and Control

Unit –I	
Introduction: Concepts in Strategic Management, Strategic Management as a process – Developing a strategic vision, Mission, Objectives, and Policies – Factors that shape a company's strategy – Crafting a strategy - Industry and Competitive Analysis.	**Hours – 10**
Unit –II	
Environmental Scanning and Leadership: Methods. SWOT Analysis – Strategies and competitive advantages in diversified companies and its evaluation. Strategic Analysis and Choice: Tools and techniques- Strategic Leadership: Leadership and Style – Key Strategic Leadership Actions - Developing Human Capital and Social Capital – Balanced Scorecard.	**Hours – 10**
Unit – III	
Strategy Formulation: Strategy Framework For Analyzing Competition, Porter's Value Chain Analysis, Competitive Advantage of a Firm, Exit and Entry Barriers - Formulation of strategy at corporate, business and functional levels. Types of Strategies – Tailoring strategy to fit specific industry – restructuring and diversification strategies – different methods Turnaround strategy and diversification strategies.	**Hours – 10**
Unit – IV	
Strategy Implementation : Strategy and Structure, Leadership, culture connection - Strategies for competing in Globalizing markets and internet economy – Organizational Values and Their Impact on Strategy – Resource Allocation – Planning systems for implementation.	**Hours –10**
Unit – V	
Strategy Evaluation and control – Establishing strategic controls - Measuring performance – appropriate measures- Role of the strategist – using qualitative and quantitative benchmarking to evaluate performance - strategic information systems – problems in measuring performance – Strategic surveillance -strategic audit.	**Hours – 10**

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

COURSE OUTCOMES:

- Ability to understand the basic concept of Strategic Management and its significance
- Know the importance of Environmental Scanning in Strategic formulation
- Understand the important considerations in strategy formulation
- Familiar with the various strategy implementation process
- Understand the key considerations in Strategy Evaluation and Control.

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. AzharKazmi, Strategic Management and Business Policy, McGraw Hill, 2008
2. UpendraKachru, Strategic Management, Excel Books, 2009
3. Vijaya Kumar P,.Hitt A : **Strategic Management**, Cengage learning, New Delhi,2010
4. John A PearceII, AmitaMital: **"Strategic Management"**, TMH, New Delhi, 2012.
5. Sanjay Mohapatra: **"Cases Studies in Strategic Management"**, Pearson, New Delhi,2012
6. Adrian Haberberg&Alison: **Strategic Management**, Oxford University Press, New Delhi, 2010

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	3	-	-	-	-	-	-	-
2	-	3	-	-	-	-	-	-
3	-	3	-	-	3	-	-	-
4	-	-	-	-	3	-	-	-
5	-	3	-	-	-	-	-	-

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Syllabus- MBA III Semester for the Autonomous Batch starting from A.Y. 2021-2022

BUSINESS ETHICS & CORPORATE GOVERNANCE			
Subject Code	**21MS13T3**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

COURSE OBJECTIVES:

- To make students understand the importance of Ethics
- To describe the impact of globalization on Indian Business ethics
- To familiarize the ethical aspects in functional departments strategies
- To make students aware of good Business and Corporate Governance
- To illustrate the Indian Scenario of Corporate Governance

Unit –I	
Importance of Business Ethics: Values and Ethics- Business Ethics and Law – Ethics in Work Place – Ethical Decision Making- Theories of Business Ethics – Management and Ethics- Indian Ethical Traditions	**Hours – 10**
Unit –II	
Impact of Globalization on Indian Business Ethics: Reasons for Unethical Practices among Indian companies – Development of Indian Capital Markets – Various studies on Ethical Attitudes of Managers Major Indian Scams	**Hours – 10**
Unit – III	
Ethics in Marketing, HRM and Finance: Product safety and Pricing-Ethical responsibility in Product- Advertising and Target Marketing Ethics of sales, advertising and product placement and Consumer Autonomy. Ethics in HRM & Finance – HR related ethical issues - Institutional Culture – Frauds in Banks - Measures against Bank Frauds – Frauds in Insurance sector	**Hours – 10**
Unit – IV	
Corporate Governance: An overview – Theory and Practice of Governance- Indian model of Governance- Good Corporate Governance – Land marks in	**Hours –10**

emergence of Governance OECB Principles – Sarbanes-Oxley Act 2002- SEBI Initiatives	
Unit – V	
Corporate Governance Indian Scenario: Role of Government in Ensuring Corporate Governance – Governance issues relating to Board of Directors – Duties and responsibilities of Auditors – Governance under limited competition – Role of Media – Corporate Governance in Developing and Transiting Economies.	**Hours – 10**
Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.	

COURSE OUTCOMES:

- Ability to understand the importance of Ethics
- Understand the impact of Globalization on Indian Business ethics
- Familiar with the Ethical aspects in Marketing, Finance and HR
- Ability to understand the significance on Corporate Governance in Business
- Students aware about the Indian model of Corporate Governance

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. A.C. Ferando, Business Ethics, Perason Education, 2009
2. SK Mandal, Business Ethics & Corporate Governance, McGraw Hill2010
3. A.C. Fernando, Corporate Governance, Person Education, 2010

OURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	-	3	-	-	-	-	-	3
2	-	-	-	3	-	-	-	-
3	-	-	2	-	-	3	-	-
4	-	3	-	-	3	-	-	-
5	-	-	-	-	3	-	-	-

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Syllabus- MBA III Semester for the Autonomous Batch starting from A.Y. 2021-2022

CUSTOMER RELATIONSHIP MANAGEMENT			
Subject Code	**21MS13M6**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

COURSE OBJECTIVES:

- To describe the importance of Customer Relationship Management in Marketing Decision Making
- To demonstrate the various CRM strategies adopted by the companies.
- To familiarize the various Marketing aspects in Customer Relationship Management
- To illustrate the various customer retention strategies and other relavant topics
- To describe the various operational and implementation aspects in Customer Relationship Management

Unit –I	
Introduction: Definition of CRM –Elements of CRM – CRM Processes and systems, Importance of CRM, Critical success factors for a winning CRM program – Advantages of CRM – Integrated CRM system –Planning and Managing CRM Programme - Application areas.	**Hours – 10**
Unit –II	
CRM as an integrated business strategy: Nature of CRM strategy – Contents of CRM Strategy – Description of Customer – Supplier Relationships, The dynamics of Relationships, The relationship oriented organization.	**Hours – 10**
Unit – III	
CRM marketing aspects: Customer knowledge, value of customer knowledge, utilization of data as an asset, multi-channels and communication- Influence of the channels on pricing and the formation of relationships – The relationship policy to improve size, quality and relationship with the customer base.	**Hours – 10**
Unit – IV	
Analytical CRM: Relationship data management – Expanding the size of customer database - Data analysis and data mining – Concept of customer loyalty – customer value assessment – Customer Retention strategies – Retention and Cross – sell analyses – effect of marketing activities – Reporting the results	**Hours –10**
Unit – V	
Operational CRM and CRM implementation: Call center Management – internet and the websites – traffic building – Providing quality during the visit to the website – Process of developing, producing, sending and following – up direct mailings. Causes for disappointing CRM results – The best CRM implementation	**Hours – 10**

strategies –Privacy and ethics Consideration in CRM implementation	

COURSE OUTCOMES:

- Ability to understand the importnace of Customer Relationship Management in Marketing Decision Making
- Familiar with the various CRM strategies adopted by companies.
- Adhere the various marketing aspects in CRM
- Understand the various customer retention strategies
- Familiar with the operational and implementational aspects of CRM.

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. S.Shanmugasundaram: "Customer Relationship Management" Prentice Hall of India.
2. Jagadish N. Seth, AtulParvatiyar, G. Sahinesh, Customer Relationship Management, McGraw Hill, 2008.
3. Ed Peelen: "Customer Relationship Management" Pearson, Education
4. Roger J Baran, Robert J Galka and Daniel P Strunk: "Customer Relationship Management" Cengage learning
5. V. Kumar, Wener J. Reinartz, Customer Relationship Management, Wiley India 2003.
6. Kaushik Mukherjee, Customer Relationship Management, Prentice Hall of India, 2009.

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	-	-	-	-	-	3	-	2
2	-	-	-	-	3	-	-	-
3	-	-	-	-	3	-	-	-
4	-	-	-	-	3	-	-	-
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Syllabus- MBA III Semester for the Autonomous Batch starting from A.Y. 2021-2022

STRATEGIC FINANCIAL MANAGEMENT			
Subject Code	**21MS13F7**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

COURSE OBJECTIVES:

- To acquaint the students with concepts of corporate strategic Financial Planning.
- To present the various corporate financial strategies
- To understand the various techqniues of Corporate Investment strategy
- To familiarize the various types of Mergers and its procedures in corporate world
- To describe the various Corporate Restructuring strategies.

Unit –I	
Corporate Policy: Strategic Financial Planning- changing complexion of regulatory framework - Shareholder Value Creation (SCV): Market Value Added (MVA) – Market-toBook Value (M/BV) – Economic Value Added (EVA) – Managerial Implications of Shareholder Value Creation- Corporate Risk Management – Understanding the firms Strategic Exposure.	**Hours – 10**
Unit –II	
Corporate Financial Strategies: Capital Structure Planning- EBIT,EPS,ROE analysis- Shareholders' Risk — Financial Options and Value of the Firm – Dividend Policy and Value of the Firm – Growth and External Financing Requirement. (Problems)	**Hours – 10**
Unit – III	
Corporate Investment Strategy: Techniques of Investment Appraisal Under Risk and Uncertainty – Risk Adjusted Net Present Value – Risk Adjusted Internal Rate of Return – Capital Rationing – Decision Tree Approach for Investment Decisions – Evaluation of Lease Vs Borrowing Decision- Long term investment plans analysis with risk and return. (Problems)	**Hours – 10**
Unit – IV	
Corporate Financial Engineering: Merger Strategy – Theories of Mergers – Horizontal and Conglomerate Mergers – Merger Procedure – Valuation of Firm – Financial Impact of Merger – Merge and Dilution Effect on Earnings Per Share – Merger and Dilution Effect on Business Control. (Problems)	**Hours –10**
Unit – V	
Corporate Restructuring: Takeover Strategy – Types of Takeovers – Negotiated and Hostile Bids – Takeover Procedure – Takeover Defenses –	**Hours – 10**

Takeover Regulations of SEBI – Distress Restructuring Strategy – Sell offs – Spin Offs – Leveraged Buyouts- Buy back shares – Alignment of Interest – Corporate Governance . (Problems)	

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

COURSE OUTCOMES:

- Students areable to understand the concepts of corporate strategic Financial Planning.
- Familiar with the various corporate financial strategies
- Know the various techqniues of Corporate Investment strategy
- Familiar with the various types of Mergers and its procedures in corporate world
- Understand the various Corporate Restructuring strategies..

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. AswathDamodaran, Corporate Finance, Theory and Practice, Wiley India Private Limited.
2. Preeti Singh: Investment Management, Himalaya Publishing House, New Delhi, 2009
3. M.Ranganadham: Investment Analysis and Portfolio Management , Pearson Education, New Delhi, 2009
4. Prasanna Chandra , Projects: Planning, Analysis, Financing Implementation and Review, 5/e TMH, New Delhi, 2003
5. V.K. Bhalla, Financial Management and policy.,Anmol Publications Pvt. Ltd.

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	-	-	-	-	-	3	-	-
2	-	-	-	-	-	3	-	-
3	-	-	-	-	-	3	-	-
4	-	-	-	-	-	3	-	2
5	-	-	-	-	-	3	-	2

3 – High; 2 – Medium; 1 – Low; 0 = No Matching

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Department of Management Science

Syllabus- MBA IV Semester for the Autonomous Batch starting from A.Y. 2021-2022

ENTREPRENEURSHIP DEVELOPMENT			
Subject Code	**21MS14T2**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

COURSE OBJECTIVES:

- To expose the students about the concepts and fundamentals of Entrepreneurship
- To create awareness about the various Entrepreneurial Training Programmes
- To familiarize the considerations in Project Feasibility study
- To know the various regulatory policies of MSME and know the resons for sickness.
- To understand the various supporting agencies in Entrepreneurship

Unit - I	
Entrepreneurship: Importance and growth - Characteristics and Qualities of Entrepreneur- Role of Entrepreneurship, Ethics and Social Responsibilities. Women Entrepreneurship: Role & Importance, Problems of Women Entrepreneurs – corporate entrepreneurship – mobility of entrepreneur – entrepreneurial motivation.	**Hours – 10**
Unit – II	
Training: Designing Appropriate Training Programme to inculcate Entrepreneurial Spirit - Training for New and Existing Entrepreneurs, Feedback and Performance of Trainees. Creativity and Entrepreneurship: Sources and Methods of Ideas Planning and Development of Programmes	**Hours – 10**
Unit – III	
Planning and Evaluation of Projects: Growth of Firm – Project identification and selection - Factors inducing growth- - Project Feasibility Study - Post Planning of Project-Project Planning and Control.	**Hours – 10**
Unit – IV	
Small and Micro Enterprises: Importance, definitions – policies and their support to MSMEs - growth and growth strategies – sickness in small business and remedies – small entrepreneurs in International business.	**Hours –10**
Unit – V	
Institutional Support to Entrepreneur and MSMEs: Role of Government - Role of IDBI, NIESBUD, SISI, DIC - Financial Institutions-Commercial Banks, Entrepreneurial Development Institutes, Universities and other Educational Institutions offering Entrepreneurial Development Programme.	**Hours – 10**

COURSE OUTCOMES:

- Understand the concepts and fundamentals of Entrepreneurship
- Familiar with the various Entrepreneurial Training Programmes
- Ability to understand the various considerations in Project feasibility study
- Know the various policie of MSME and familiar with the reaons for sickness
- Understand the process of business idea generation and converting the idea into a business model.

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. Rajeev Roy: "Entrepreneurship", Oxford University Press, New Delhi,2012
2. Charantimath, Entrepreneurship Development, Small Business Development, Perason Education, 2011
3. Vasanth Desai, Entrepreneurship Development, Himalaya Publishing House, 2010.
4. Gordon NataRajan, Entrepreneurship Development, Himalaya Publishing House, 2010.

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	-	-	-	-	-	-	-	3
2	-	-	-	-	-	-	-	3
3	-	-	-	-	-	-	-	3
4	-	-	-	-	-	-	-	3
5	-	-	-	-	-	-	-	3

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Department of Management Science

Syllabus- MBA IV Semester for the Autonomous Batch starting from A.Y. 2021-2022

SERVICES MARKETING			
Subject Code	**21MS14M3**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

COURSE OBJECTIVES:

- To uderstand the theory and concepts pertaining to Services marketing.
- To familirise the key deiensions in Service Marketing
- To describe the Services Marketing Mix elements
- To familiarize the various Services marketing strategies in various sectors
- To familiarize the Marketing pratices in various service indsutries

Unit - I	
Introduction to Services Marketing: Scope and Definition- Services Marketing Environment- Definition- Goods and Services- Components of Service- Characteristics- Service Delivery as a System- Service Facility Design and Layout- HRM Issues- -Building Services Aspirations- Tracking Customer Behavior-.	**Hours – 10**
Unit – II	
Key Dimensions of Services Marketing: Introduction- Service Environment- Service Blue Printing- Service Encounter- Customer Expectations- Demand-Supply Management- Service Quality- Service Quality Gap- Service Quality Audit-Delivering Quality ServicesCommunication Strategies- Bench Marking-TQM-Customer Satisfaction Measurement Techniques- MPQ-ROQ- Service Guarantees.	**Hours – 10**
Unit – III	
Management of Services Marketing: Introduction- Marketing Mix- Developing a Package- Product Attractiveness- Components of Promotion Mix- Strategic Services Marketing- Service Target Segments- Positioning the Services- Creating and Maintaining Value Relationship- Market Leadership Strategies	**Hours – 10**
Unit – IV	
Service Marketing Practices I: Marketing of Financial and Insurance Services- Major Characteristics- Technological Innovations- Regulatory Mechanism- Marketing of Hospitality, Travel and Tourism Products- Marketing for Travel and Tourism- Segmentation- Tourism Marketing Strategies- Yield Management- Services Delivery- Global Service Quality- Marketing of Educational, Software and other Professional Services	**Hours –10**
Unit – V	
Service Marketing Practices II: Marketing of Health Care, Celluar and Entertainment Services Health Care Marketing Strategy- Major Hospital Products- Cellular Promotion Mix- Entertainment Marketing Mix- Emerging Influence of Retailing and Shopping Malls- Internationalization of Services- Liberalization of Services- Off shoring – ITES- Industry Structure- Business	**Hours – 10**

Models	
Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.	
COURSE OUTCOMES: • Develop familiarity with the concepts of Services Marketing • Ability to know the key deiensions in Service Marketing • Adhere the the Services Marketing Mix elements • Familiar with the various Services marketing strategies in various sectors • Understand the Marketing pratices in various service indsutries	
QUESTION PAPER PATTERN: **SECTION A:** • Five one page answer questions from each unit. **SECTION B:** • Three easy type questions out of five questions. **SECTION C:** • Case Study (Compulsory question)	
REFERENCE BOOKS: 1. Rajendra Nargundkar: Services Marketing, TMH, New Delhi 2011. 2. Christian Gronroos: Service Management and Marketing, Wiley India, New Delhi,2010 3. Ram Mohan Rao, K: "Services Marketing", Pearson Education, New Delhi, 2013. 4. Govind Apte: Services Marketing, Oxford University Press, New Delhi, 2010 5. Varlic Zeithamal Services Marketing, Tata McGraw Hill.	

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
1	-	-	-	-	-	3	-	-
2	-	-	-	-	-	3	-	-
3	-	-	-	-	-	3	-	-
4	-	-	-	-	-	3	-	-
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Syllabus- MBA IV Semester for the Autonomous Batch starting from A.Y. 2021-2022

GLOBAL MARKETING MANAGEMENT			
Subject Code	**21MS14M5**	Internal Marks	40
Number of Lecture Hours/Week	04	External Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
Credits – 04			

COURSE OBJECTIVES:

- To describe conceptual framework of global marketing
- To discuss the international marketing strategy
- To familiarize the International product strategies
- To specify the Global Marketing Channels and Promotion
- To familiarize the export and import procedures

Unit - I	
Introduction to Global Marketing: Scope and Significance of global Marketing, - Difference between global and domestic marketing – The growing attractiveness of developing country market – International orientations, Stages of internationalization, Driving and restraining forces of global markets, Participants in international marketing.	**Hours – 10**
Unit – II	
International marketing strategy: Entry strategies in Global markets – modes of entries in global markets – global market segmentation – international targeting – criteria for targeting, selecting a global target market – Global product positioning strategy. Business Customs in global Market – strategies for FDI and FIIs - Entry Strategies of Indian Firms	**Hours – 10**
Unit – III	
Global Product & Price management: International product mix – Managing Global Research and Development for product management– Product diffusion and adoption in global markets – International Product Life Cycle – Product and culture – Global brand leadership – : Environmental influences on Pricing Decisions – Grey Market goods – Transfer pricing – Global Pricing – Policy Alternatives – Constraints on global pricing	**Hours – 10**
Unit – IV	
Global Marketing Channels and Promotion for global markets: channels – Innovations in global channels – Channel strategy for new market entry – Distribution Structures – Global Distribution Patterns - Challenges in Managing An Global Distribution Strategy – Selecting Foreign Country Market intermediaries - Global Advertising and branding - Export Policy Decisions of a firm - Export costing and pricing – EXIM policy of India.	**Hours –10**
Unit – V	
Export procedures and documents: Preliminaries: inquiry and offer – confirmation of offer – export license – finance – production /procurement of	**Hours – 10**

goods – shipping space – packing and marketing – quality control and pre – shipment inspection – excise clearance – customs formalities – negotiation and documents – standardization and aligned pre-shipment documents – documents related to goods – documents related to shipments.	

COURSE OUTCOMES:

- Ability to understand conceptual framework of global marketing
- Familiar with the international marketing strategy
- Understand the International product strategies
- Understand the Global Marketing Channels and Promotion
- Know the export and import procedures

QUESTION PAPER PATTERN:

SECTION A:

- Five one page answer questions from each unit.

SECTION B:

- Three easy type questions out of five questions.

SECTION C:

- Case Study (Compulsory question)

REFERENCE BOOKS:

1. Warren Keegan, Global marketing Management, Pearson Education,
2. P.K. Vasudeva, International Marketing, Excel Books
3. Czinkota: International Marketing, Cengage Learning, New Delhi, 2009
4. Philip R. Cateora, John L. Graham, International Marketing 11/e, Tata McGraw-Hill Co. Ltd., 2002.
5. R.Srinivasan: International Marketing, Prentice-Hall of India Pvt. Ltd., 2010
6. U.C Mathur: International Marketing Management, Sage Publications, New Delhi 2008
7. FracisCherunilam, International Marketing , Himalaya Publishing House
8. Ravi Sarathy, VernnTrepestra, Intenational Marketing, Thomson South – Western
9. Subhash C. Jain, International Marketing, Thomson South – Western.

COURSE OUTCOMES TO PROGRAM OUTCOMES MAPPING:

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1	-	-	-	2	-	3	-	-
2	-	-	-	-	-	3	-	-
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5	-	-	-	-	-	3	-	2

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Women Welfare-Sexual Harassment Eradication Cell

Academic Year 2018-19

Annual Report

I. Executive Summary:

The committee is pleased to present the annual report for the academic year 2018-19. This year has been marked by one two events. The committee tried its best in utilising the opportunities for student activities.

II.Events Highlights:

Celebrating the Special Days: Awareness Laws related to women & International women's day. Throughout the year, we conducted two programs for educating our rural background students in all aspects.

Awareness on program on **Laws related to women** was conducted by Women Welfare - Sexual Harassment Eradication Cell to create awareness on Laws related to women at our college. On the occasion of International Women's day "**Awareness on legal provision for women protection and women empowerment**", Just A Minute (JAM) on "The role of women in society", Online quiz on "Rights & Laws related to women" , Role play on "Laws related to women".

Smt Vanka Rajakumari, Joint Managing Director, Vanka group of companies who was the Chief Guest of the function, advised all the girl students to know the Legal Rights available to protect women Life from birth to death.

Ms Vanka Ravali, lawyer addressed the gathering and created awareness on legal rights of women. Smt Meka Kranthi sudha, Executive director advised the students to look the problem from different angles and try to come up with innovative solutions.

International women's day

As per the directions of Vice Chairman and with the permission of Principal we have conducted games & sports meet 2018 on the occasion of women's day on 07-03-2018 at Sasi Institute of Technology & Engineering, Tadepalligudem.

The following are the events conducted

1) Throw ball

2) Tennicoit

Students from various colleges have participated in the events. Around 160 Students from various colleges and 5 physical directors have attended the meet .

Prize distribution was held at the MLA office tadepalligudem on 10/03/2018. Our college students have received Trophy, medels& certificates by our Honorable MLA Sri P.Manikyala Rao at party camp office in Tadepalligudem.

III. Student Participation:

S.No	Name of the Event	Date of Activity	Number of students participated
1	Awareness on laws related to women	22-11-2018	360
2	International women's day	08-03-2019	453

IV. Conclusion: The committee is proud of the accomplishments of the past year. We remain committed to our mission of empowering girls to next generation.

Committee Coordinator

Mrs. K. Usha Maheswari

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Academic Year 2019-20
INTERNAL COMPLAINT COMMITTE

Annual Report

I. Executive Summary:

The committee is pleased to present the annual report for the fiscal year 2019-20. This year has been marked by oneWomen welfare events. The committee tried its best in utilising the opportunities for student activities.

II.Events Highlights:

Celebrating the Special Days: National Science Day &International women's day. Throughout the year, we conducted two event for educating our rural background students in all aspects.

National Science Day

National Science Day was celebrated on 28th February, 2020 at Government Girls High School, Tadepalligudem, to create awareness among the students regarding the importance of Science & Technology, Nirbhaya Act 2013 and Disha Act 2019 by SITE Women Welfare Committee along with SITE NSS team.

On this occasion girl student volunteers delivered their talk on the importance of Science & Technology and created awareness on Nirbhaya Act 2013 and Disha Act 2019. They gave some inputs to the students of 10th class towards preparation of State Board Examinations.

International Women's Day

International Women's Day was celebrated on 8th March, 2019 at the college premises. All the female students and female staff of SITE participated in the celebrations.In this regard, Women Welfare Committee of the college organized 3K run for the female students of the college. Along with the girl students our beloved guests Dr.Chityala Padmini, M.B.B.S.,Dermatologist, Smt.Seetharama Lakshmi, Member of parliament,Rajya Sabha, Dr.K.Padmaja and Executive director M.Kranthi sudha participated in the event.

Later she spoke about the theme of International women's day-2019 "Balance for Better" .Our college Executive Director, M.Kranthi Sudha spoke about the equal rights for women. Our Chief guest , Dr.Kodey Prabha Devi,MD,DGO,Professor & HOD,Department of Obstetrics & Gynaecology,NRI Medical college & hospital,Chinakakani, Guntur District, spoke about women health issues and precautions to take about their personal health care.

III. Student Participation:

S.No	Name of the Event	Date of Activity	Number of students participated
1	National Science Day	28-02-2020	90
2	International women's day	08-03-2020	411

IV. Conclusion: The committee is proud of the accomplishments of the past year. We remain committed to our mission of Empowwering girls to next genaration.

Committee Coordinator

Mrs. T. Bhavani

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Women Welfare-Sexual Harassment Eradication Cell

Academic Year 2020-21

Annual Report

I. Executive Summary:

The committee is pleased to present the annual report for the academic year 2020-21. This year has been marked by one Women welfare event. The committee tried its best in utilising the opportunities for student activities after COVID.

II.Events Highlights:

Celebrating the special days: International Women's day. Throughout the year, we conducted only one program because of the pandemic situation.

International women's day was organized by the Women Welfare Committee has organized "An interaction with Directors of ISSA Designer Studios, Hyderabad" .Smt. M Kranthi Sudha executive director had addressed gathering with her pleasant smile and valuable Suggestions in the form of take away.

Later Guest Mrs. Swathi Ravi had addressed gathering by the way that she scaled heights in this profession with her passion and commitment.

Guest Mrs. Chetana Sagiraju had addressed the gathering from the initiation of ISSA Designer Studios. Business Techniques what were used and the way to handle downfall. Later she told that business is a Sinusoidal Wave. Students interaction followed by felicitation with shawls to Chief Guests was done along with Mrs. Yamini, Mother of Vice Chairman Mr. M Narendra Krishna. Face arts were presented to them. Later they had disclosed the present in front of the gathering. Later students were provoked with the real life challenges of an Entrepreneur.

III. Student Participation:

S.No	Name of the Event	Date of Activity	Number of students participated
1	International women's day	8-3-21	569

IV. Conclusion: The committee is proud of the accomplishments of the past year. We remain committed to our mission of empowering girls to next generation.

Committee Coordinator

Mrs. Y. Priyanka

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Women Empowerment Cell
Academic Year 2021-22

Annual Report

I. Executive Summary:

The committee is pleased to present the annual report for the academic year 2021-22. This year has been marked by a series of some Women welfare events. The committee tried its best in utilising the opportunities for student activities aftermath of the pandemic.

II. Events Highlights:

Celebrating the Special Days: National Girls Day and International Women's day at Kondruprolu, International women's day at SITE. Throughout the year, we conducted several events on the important days like national and international events.

National Girls Day event was conducted by Women Welfare Committee & Internal Complaint Committee at Govt.Girls High School, beside NIT-AP, Kadakatla .Volunteers organized Essay Writing & Drawing Contest on various topics related to Girls Safety to school students perusing 6th to 10th classes. Volunteers created awareness on the following topics to school students with NSS Girl Student volunteers &also conducted cultural activities

Topics: Importance of Education to Girl Students, Crime against Girls, Health & Hygiene, Academics during COVID pandemic etc. In this event SITE management distributed Sanitizers, Masks & Snacks to school students. Govt. Girls high school I/c H.M. Sri. K. Rama Krishna & their staff, Ward Mahila Police Ms. Pratima, Parents Committee Chairman Sri. Daniel Raj appreciated the efforts of SITE – NSS Unit volunteers on National Girl Child Day.

International women's Day at kondruprolu, was conducted by ICC of SITE attended women welfare meeting. The meeting addressed by different village government authorities and discussion goes on different activities and issues in kondruprolu village issues like hygienic environment, rural area problems, cleaning activities and finally celebrated internal women's day at the village.

Myself as a coordinator of ICC interacted with the women in village by discussion on different issues and encouraged them to take a part on leading your family financial matters by empowering yourself with small scale business. **International women's Day at SITE:** On the eve of International Women's day, **ICC** of SITE organized an interaction with Chekka Priyanka, Deputy Collector CEO karimnagar. Mrs. Chekka Priyanka had addressed gathering by the way that she scaled heights in this work with her passion and commitment. She shared her view and thoughts with the student and shared her experience in Sasi as a student. Discipline is the main thing that is required as a student which is thought by Sasi place a main role to build the career. Students interaction followed by felicitation with shawls to chief guest was done with Mrs.Yamini, Director Sasi Educational Society

III. Student Participation:

S.No	Name of the Event	Date of Activity	Number of students participated
1	National Girls Day	24-01-2022	50
2	International women's day	07-03-2022	50
3	International women's day	08-03-2022	351

IV. Conclusion

The committee is proud of the accomplishments of the past year. We remain committed to our mission of empowering girls to next generation.

Committee Coordinator

Mrs. N.Sannajaji
Asst. Professor

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Women Empowerment Cell
Academic Year 2022-23
Annual Report

I. Executive Summary:

The committee is pleased to present the annual report for the fiscal year 2022-23. This year has been marked by a series of some successful Women welfare events.. The committee tried its best in utilising the time and opportunities for student activities aftermath of the pandemic.

II. Events Highlights:

Celebrating the Special Days: Awareness on Women Safety & Importance of Disha App, National Girls Day, International Women's day, Awareness on Women Empowerment.
Throughout the year, we conducted several events on the eve of important days like national and international events.

Awareness on Women Safety & Importance of Disha App - Internal Complaint Committee in association with NSS Unit of Sasi Institute of Technology & Engineering organized **"Awareness on Women Safety & Importance of Disha App"** in association with AP Police, Tadepalligudem on 04.06.2022 in their respective classes. In this program Tadepalligudem, Rural Sub Inspector Mr. N. Srinivasa Rao and his staff Mahila Police demonstrated about the importance of Disha app and precautions for women safety has been explained.

National Girls Day - event Human Chain – with a theme based rangoli at the center on the occasion of National Girl Child Day on 24th January, 2023 in front of Pascal Block .The objective of the event is to spread this year's theme: "Digital Generation – Our Generation", to increase awareness about the declining child sex ratio in India and to ensure equal opportunities for the girls in the field of education, health, legal rights, honor, protection etc.,

Awareness on "Countering Cyber Attacks and Cyber Frauds" - Women Empowerment Cell of SITE attended online event with JNTUK, related to Cyber Security Awareness on "Countering Cyber Attacks and Cyber Frauds on Women" on 04.02.2023 .The meeting was started with the address of Honorable Vice Chancellor and launched an app "World of Women". The app is related to health & security of women.

Dr. A.S.N. Chakravarthy, Special Officer SDC, WDC and BMC, JNTUK, discussed on cyber attacks –

- Internet is invaluable source of activities.
- Cyber security is more powerful ever before.
- Women should be taught how to be privacy.
- Lack of knowledge on cyber security tools makes women to be victim in this fast growing world.

The key steps in cyber security –

- How to protect against Ransonware software?
- How to protect yourself?
- Authentication of user.
- General Security – Antivirus Software.

Finally, the meeting was ended with the vote of thanks by the convener Dr. M. Swaroopa Rani, Director Empowerment of Women & Grievance, JNTU, Kakinada

International women's day - "An interaction with Ms. Divya Reddy, an entrepreneur, social activist and founder of Divya Reddy foundation" for all B. Tech female students. She had addressed the gathering with her pleasant smile and valuable suggestions.

1. Beware of toxic people in life.

2. Types of Narcissism like Vulnerable Narcissism, Communal Narcissism etc.,

3. Three give a ways:

   a. Self love

   b. Financially Independent

   c. Marry when you are ready for it

Awareness on Women Empowerment - event is organized at Krishanpuram village, Nilladripuram Mandal, West Godavari District on May 27th, April 2023.

Dr. P. R. Krishna Veni, Coordinator of Women Empowerment Cell SITE, addressed the gathering and the speaker of the program was Dr. Manohari Velamati, Founder and Managing Trustee, Gramdeep Trust, Kovavali village, Denduluru Mandal, Eluru District.

In her speech, she mainly focused on topics related to

1. Reservation about women
2. Harassments being faced by women now-a-days
3. Waste shed management
4. Employment for women
5. Confidence development in reaching goal

III. Student Participation:

S.No	Name of the Event	Date of Activity	Students participated
1	Awareness on Women Safety & Importance of Disha App	04-06-2022	78
2	National Girls Day	24-01-2023	78
3	Awareness on "Countering Cyber Attacks and Cyber Frauds"	04-02-2023	85
4	International women's day	04-03-2023	815
5	"Awareness on Women Empowerment"	27-03-2023	62

IV. Conclusion

The committee is proud of the accomplishments of the past year. We remain committed to our mission of empowering girls to next generation.

Committee Coordinator

Dr. P. R. Krishna Veni,

(Assoc. Prof.)

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Gender Sensitization Activities

S.No.	Academic Year	Date(s) of Event	Name of the Event
1.	2018-19	22-11-18	Awareness on laws related to women
2.		08-03-19	International women's day
3.	2019-20	28-02-20	National Science Day
4.		08-03-20	International women's day
5.	2020-21	08-03-21	International women's day
6.	2021-22	24-01-22	National Girls Day
7.		07-03-22	International women's day
8.		08-03-22	International women's day
9.	2022-23	04-06-22	Awareness on Women Safety & Importance of Disha App
10.		24-01-23	National Girls Day
11.		04-02-23	Awareness on "Countering Cyber Attacks and Cyber Frauds"
12.		04-03-23	International women's day
13.		27-03-23	"Awareness on Women Empowerment"

IQAC Coordinator

Coordinator, IQAC
Sasi Institute of Technology & Engineering (A), Tadepalligudem, W.G.Dist., A.P.

Principal

Principal
Sasi Institute of Technology & Engineering (A)
Tadepalligudem, W.G.Dt., A.P.

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Environment and Sustainability Activities

S.No.	Academic Year	Date(s) of Event	Name of the Event
1	2021-22	12.10.21	Clean India (Swatch Bharat-Swatch Campus)
2	2019-20	02.10.19	Swatch Bharat-Swatch Tadepalligudem
3	2022-23	18.10.22	Swatch Bharat-(Clean India) 2.0
4	2022-23	26.04.23	Plantation, Swachh Bharath – Swachh gramam, Awareness on No Plastic Usage
5	2021-22	07.03.22 to 13.03.22	Heathy Youth for Healthy India
6	2022-23	29.08.22	Clay Ganesh Idols (Save Environment Awareness Campaign)
7	2018-19	26.01.19	Plantation Program
8	2021-22	09.12.21 & 10.12.21	Plants Sampling Distribution
9	2021-22	21.12.21	Plantation & Blood Donation Camp
10	2021-22	24.02.22	Udyana Sndarshana -2022

IQAC Coordinator

Coordinator, IQAC
Sasi Institute of Technology &
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Principal

Principal
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