Department of Electrical Engineering
S. Y. B. Tech. Curriculum

Class	S. Y. B. Tech. Semester-III
Course Code and Course Title	0EEMC206, **Environmental Studies**
Prerequisite/s	--
Teaching Scheme: Lecture	02
Credits	--
Evaluation Scheme: ISE	50 (Grade)

Course Outcomes (COs)	
Upon successful completion of the course students will be able to:	
0EEMC206.1	Explain importance of environmental studies with necessary of acts.(K^2)
0EEMC206.2	Explain importance of public awareness on environmental problems (K^2)
0EEMC206.3	Write a technical report in team regarding course and impacts of environment related issues.(S^2)
0EEMC206.4	Discuss current concern of environment issues.(A^2)
0EEMC206.5	Describe the need of environment protection and ethics.(A^2)

Course Contents:

Unit 1: Nature of Environmental Studies

Definition, scope and importance. Multidisciplinary nature of environmental studies. Need for public awareness.

(02Hrs)

Unit 2: Natural Resources and Associated Problems

a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people; b) Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.

(04Hrs)

Unit 3: Ecosystems

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, characteristics features, structure and function of the following ecosystem :- a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem d)Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

(04Hrs)

Unit 4: Biodiversity and its conservation

Introduction- Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega- diversity nation. Western Ghat as a biodiversity region. Hot-spots of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man-wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

(05Hrs)

Unit 5: Environmental Pollution

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Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.

(04Hrs)

Unit 6: Social Issues and the Environment

Disaster management: floods, earthquake, cyclone, tsunami and landslides Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products.

(03Hrs)

Unit 7: Environmental Protection

From Unsustainable to Sustainable development Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights

(06Hrs)

Mini Project	**Mini project based on ;** Environmental assets River/Forest/Grassland/Hill/Mountain. OR A local polluted site Urban/Rural/Industrial/Agricultural. OR Study of common plants, insects, and birds. OR Study of simple ecosystems - ponds, river, hill slopes, etc. **(Mini Project report is Mandatory.)**

Assessment Method:

1. Mini Project report – 10 marks
2. ISE question paper format will be Multiple Choice Questions- 40 Marks

Unit No.	Topic Name	Weightage
1	Nature of Environmental Studies.	4 Marks
2	Natural Resources.	7 Marks
3	Ecosystems	7 Marks
4	Biodiversity and its conservation	7 Marks
5	Environmental Pollution	7 Marks
6	Social Issues and the Environment	8 Marks

IMPORTANT NOTES:

1. **ISE will be conducted in 14th week of semester.**
2. **Mini Project report will be submitted to course coordinator in 10th week of semester.**
3. **Students should get minimum 40% marks to get PP (PASS) grade.**
4. **Students getting less than 40% marks will be offered NP (NOT PASS) grade.**
5. **To get B. Tech. Degree PP grade in Environmental Studies is mandatory.**

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Environmental Studies	Dr. B. S. Chauhan	University Science Press, New Delhi	1st	2008
2	Environmental Studies	Dr. P. D. Raut	S. U. Kolhapur	3rd	2011

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Principals of Environmental Science and Engineering	Raman Sivakumar	Cengage learning Singapore	2	2005
02	Elements of Environmental Science and Engineering	P. Meenakshi	Prentice Hall of India Private Limited, New Delhi	-	2006
03	Environmental Science – working with the Earth	G.Tyler Miller Jr	Thomson Brooks /Cole	11	2006

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NDCET

Department of Electrical Engineering
S. Y. B. Tech. Curriculum

Class	S. Y. B. Tech. Semester-III
Course Code and Course Title	**1EEMC207, Environmental Studies**
Prerequisite/s	--
Teaching Scheme: Lecture	02
Credits	--
Evaluation Scheme: ISE	50 (Grade)

Course Outcomes (COs)	
Upon successful completion of the course students will be able to:	
1EEMC207_1	Explain importance of environmental studies with necessary of acts.(K^2)
1EEMC207_2	Explain importance of public awareness on environmental problems (K^2)
1EEMC207_3	Write a technical report in team regarding course and impacts of environment related issues.(S^1)
1EEMC207_4	Discuss current concern of environment issues.(A^2)
1EEMC207_5	Describe the need of environment protection and ethics.(A^2)

Course Contents		
Unit 1	Definition, scope and importance. Multidisciplinary nature of environmental studies, Need for public awareness.	**2 Hrs**
Unit 2	a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people; b) Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy, f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.	**4 Hrs**
Unit 3	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, characteristics features, structure and function of the following ecosystem :- a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem d)Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	**4 Hrs**
Unit 4	Introduction- Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega- diversity nation. Western Ghat as a biodiversity region. Hot-spots of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man- wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**5 Hrs**
Unit 5	Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.	**4 Hrs**
Unit 6	Disaster management: floods, earthquake, cyclone, tsunami and landslides Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products.	**3 Hrs**
Unit 7	From Unsustainable to Sustainable development Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights	**6 Hrs**

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Mini Project	**Mini project based on :** Environmental assets River/Forest/Grassland/Hill/Mountain. OR A local polluted site Urban/Rural/Industrial/Agricultural. OR Study of common plants, insects, and birds. OR Study of simple ecosystems - ponds, river, hill slopes, etc. **(Mini Project report is Mandatory.)**

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Department of Civil Engineering

Course Details:

Class	B. Tech, Sem.-VI (Elective)
Course Code and Course Title	0CVPE317, **Solid Waste Management**
Prerequisite/s	Basic chemistry
Teaching Scheme: Lecture/Tutorial	3/0
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Objectives:	
01	To study the importance of solid waste management.
02	To understand various operations of material and energy recovery in SWM
03	To describe concept of land filling and its controlling techniques.
04	To study different economical aspects and methods of refuse

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
0CVPE317 _1	**Discuss** the sources ,objective and functional outlines of Solid Waste Management (K^2)
0CVPE317 _2	**Describe** the various types of material and energy recovery operations .(K^2)
0CVPE317 _3	**Explain** various types of waste management systems (K^2)
0CVPE317 _4	**Illustrate** various economical aspects and methods of refuse (K^3)
0CVPE317 _5	**Illustrate** the concept of land filling and leachate controlling techniques. (K^3)

Course Contents:		
Unit 1	**Solid Waste Management:** Definition, objectives, effects, Functional outlines of solid waste, sources, types, refuse analysis, composition and quantity of refuse. Special MSW: waste from commercial establishments and other urban areas, solid waste from construction activities, biomedical wastes, Effects of solid waste on environment: air, soil, surface and ground water, health hazards.	**07 Hrs**
Unit 2	**Integrated Solid Waste Management System:** Collection, Storage, Segregation, Reuse and Recycling possibilities. Generation rate, Factors affecting generation rate, different methods of collection, collection systems, Storage, transfer and transportation of refuse, economic aspects of refuse collection & transport.	**07Hrs**
Unit 3	**Management of Wastes** Municipal, Biomedical, Nuclear, Electronic and Industrial Solid Wastes and the rules and regulations. Introduction to Hazardous waste management and Agricultural & animal waste management. Hazardous Waste: Risk assessment, Environmental legislation, characterization and site assessment.	**07Hrs**
Unit 4	**Reduce, Recycle, Reuse of solid waste (3R techniques)** Segregation and salvage, recovery of bye –products, use of solid waste as raw materials in industry, Concept of incineration, types of incineration, recycling of solid waste. plastic waste environmental significance and reuse. Reuse and Recycling possibilities	**07Hrs**

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Unit 5	**Concept of Composting and Solid waste management rules** Types, factors governing, processing, mechanical composting plant, Facility Development and operation, Site Remediation: Quantitative risk assessment, site. Solid waste management rules, Status of solid waste management in India	07Hrs
Unit 6	**Land Filling:** Types , site selection, construction techniques, design of landfill site, maintenance and precautions, leachate and its control, control of contamination of ground water, Operation monitoring ,Closure & end-use.	07Hrs

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Sewage disposal and air pollution engineering	S.K.Garg	Khanna publishers	33rd	2015
02	Air Pollution	M.N. Rao and H.V.N. Rao	Tata McGraw-Hill Education Pvt. Ltd., New Delhi	19th	2010
03	Introduction to Environmental Engineering	P. Aarne Vesilind, Susan, M. Morgan, Thompson	Tata McGraw-Hill Education Pvt. Ltd., New Delhi	2nd	2008
04	Solid Waste Management	George Tchobanoglous	McGraw-Hill Book Company	2nd	2002
05	Integrated Solid Waste Management	Tchobanoglous, Theissen & Vigil.	McGraw Hill Publication	1st	2001

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Geoenvironmental Engineering: Site Remediation, Waste Containment and Emerging Waste Management Technologies	Sharma H.D., and Reddy K.R.	John Wiley & Sons,	1st	2004
2	Geoenvironmental Engineering: Site Remediation, Waste Containment and Emerging Waste Management Technologies	Sharma H.D., and Reddy K.R.	John Wiley & Sons, Inc. Hoboken, New Jersey	2nd	2004
3	Wastewater Engineering	Metcalf and Eddy	TMH Publication	4th	2003
4	Geotechnical aspects of landfill design and construction	Qian X., Koerner R. and Gray D.H.	Prentice Hall	2nd	2002

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ADCET

Department of Civil Engineering

Course Details:

Class	B. Tech, Sem.-VII
Course Code and Course Title	0CVPE410, **Green Building**
Prerequisite/s	1CVPC205,1CVPC209
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
0CVPE410_1	**Discus** orientation and lighting provision in building (K^2)
0CVPE410_2	**Explain** passive, active architecture and energy audit of building (K^2)
0CVPE410_3	**Explain** recycling and embodied energy of different building materials. (K^2)
0CVPE410_4	**Illustrate** various methods of improving efficiency of water uses in green building (K^3)
0CVPE410_5	**Apply** the different green building rating systems. (K^3)

Course Contents:		
Unit 1	**Orientation and lighting of green building :** Sustainable site selection orientation, building envelop, building plan layout, design of doors and windows, natural ventilation, solar energy - use of solar energy for water heating, solar photovoltaic panels, direct and indirect lighting, comparison of various lighting devices-electric tubes, incandescent lamps, CFL and LED lamps, Indirect lighting devices- fibre optic, Fresnel lens.	**10 hrs**
Unit 2	**Passive and active architecture:** Introduction to Passive and active architecture, Natural ventilation and air conditioning, Hybrid system of active and passive refrigeration and air-conditioning. Energy audit of building.	**06 hrs.**
Unit 3	**Water efficiency:** Rain water harvesting, potable water and bore well recharging, minimization of water use, dual flush, Waterless urinals, Smart controlled water tabs, Recycling of treated waste water for different non potable use, Domestic solid waste –segregation, green materials, water audit of building.	**06 hrs.**
Unit 4	**Recycling of building materials:** Exiting walls, roofs and floors, Materials use, Recycled content, Use of fly ash, foundrysand and other inert solid wastes in building, life cycle analysis. Concept of Embodied energy of various common building materials.	**06 hrs**
Unit 5	**GRIHA and SVAGRIH:** Introduction to GRIHA and SVAGRIHA. GRIHA and SVAGRIHA criteria.	**07 hrs**
Unit 6	**LEED:** Introduction to LEED. LEED Criteria	**07 hrs.**

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Text Books:					
Sr. No	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
01	National Building Code 2017.	Bureau of Indian Standards	Bureau of Indian Standards	1st	2016
02	Green Building: Principles and Practices in Residential Construction	Abe Kruger, Carl Seville	Delmar Learning	2nd	2012
03	Green Building Guidance	KarthikKaruppu	Notion Press	1st	2019
04	GRIHA Manuals	The Energy and Resources Institute	TERI Press	1st	2007
05	SVAGRIHA	The Energy and Resources Institute	TERI Press	1st	2007

Reference Books:					
Sr. No	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
01	Green Building – Guidebook for Sustainable Architecture	Michael Bauer, Peter Mosle and Michael Schwarz	Springer Publication	2nd	2014
02	Handbook of Green Building Design and Construction: LEED, BREEAM, and Green Globes	Sam Kubba	Elsevier	2nd	2012
03	Green Building with Concrete: Sustainable Design and Construction	Gajanan M. Sabnis	CRC Press	2nd	2015
04	Passive House Details	Donald B. Corner, Jan C. Fillinger, Alison G. Kwok	Routledge Press	1st	2017

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B Tech - CV. 24/89

ADCET

Department of Civil Engineering

Course Details:

Class	B. Tech, Sem. - VII
Course Code and Course Title	0CVOE413, **Air Pollution and Control**
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50

Course Outcomes(COs): Upon successful completion of the course, the student should be able to	
0CVOE413_1	**Discuss** physics of atmosphere (K^2)
0CVOE413_2	**Describe** concept of dispersion of pollutant in the atmosphere (K^2)
0CVOE413_3	**Illustrate** concept of particulate matters and various controlling equipment for particulate matter (K^3)
0CVOE413_4	**Discuss** various control measures for gaseous pollutant (K^2)
0CVOE413_5	**Summarize** various automobile source of pollution (K^2)

Course Contents:		
Unit 1	**Physics of atmosphere:** Solar radiation, Wind circulation, Lapse rate, Inversion, Stability conditions, Pasquil stability model, maximum mixing depth, Wind rose, Plume behavior, Heat island effect, Green house effect, Rain drop formation, Visibility, Photochemical reaction	**08 hrs**
Unit 2	**Dispersion of pollutants in the atmosphere:** Eddy diffusion model, the Gaussian dispersion model, point source, Line source, maximum ground level concentration, Determination of stack height, sampling time corrections, Effects of inversion trap.	**07 hrs**
Unit 3	**Particulate matter:** Definitions of different particulate matter, Distribution and source of SPM, Terminal settling velocity, Hood and duct design, Particulate collection design.	**07 hrs**
Unit 4	**Control equipment for particulate matter**: Settling chamber, Cyclone, Wet collectors, Fabric filter, Electrostatic precipitator, Problems on design of equipment, Component detailing collection efficiency	**06 hrs**
Unit 5	**General control of Gaseous pollutants:** Principles of absorption, Adsorption, Basic design of absorption and adsorption units, Incineration and after burner, Control of sulphuric dioxide, NOx.	**07 hrs**

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Unit 6	**Automobile source:** Emission of pollutants from automobiles, Reduction of emissions by different methods, Alternative fuels and their utilizations. Strategy for effective control of air pollution in India.	**07hrs**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Yearof Edition
01	Sewage disposal and air pollution engineering	S.K.Garg	Khanna publishers	33rd	2015
02	Environmental pollution and control	Dr. H.S. Bhatia	Galgotia Publications Pvt. Ltd.	2nd	2018
03	Air pollution and control	Keshav kant	Khanna publishing	1st	2018
04	Air pollution	Rao M. N. and Rao H.V.	Tata McGraw Hill	2nd	1990

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Environmental Engineering	H.S. Peavy, D.R.Rowe	McGraw Hill	2nd	1985
02	Chemistry for Environment Engineering	Sawyorand McCarthy	Tata McGraw Hill Publishing Company Ltd.	9th	1967
03	Air Pollution and Control	K.V.S.G. Murali Krishna	USP	1st	2017
04	Air Pollution Control :A Design Approach.	C David Cooper	Medtech	4th	2015

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Course Details:

Class	B. Tech, Sem.-VIII
Course Code and Course Title	0CVPE431, **Industrial Waste Water Treatment**
Prerequisite/s	0CVPC303, 0CVPC309
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50

Course Outcomes: Upon successful completion of the course, the student should be able to	
0CVPE431_1	Explain characterization of industrial waste water (K^2)
0CVPE431_2	Discuss various treatment processes and effluent quality standards for industrial waste water. (K^2)
0CVPE431_3	Describe various industrial waste water treatment techniques (K^2)
0CVPE431_4	Compute the various parameters of effluent treatment plant (K^3)
0CVPE431_5	Classify various industrial waste water and manufacturing processes (K^4)

Course Contents:		
Unit 1	**Basics of industrial waste water** : Water use in industry, Industrial water quality requirements, Deterioration of water quality, Classification and characterization of Industrial wastewater, Monitoring of wastewater flow in industries, Quality and quantity variations in waste discharge, Water budgeting	**06 Hrs.**
Unit 2	**Classification of Industrial Waste and Manufacturing processes**: Water usage, Sources, Quantities, and characteristics of effluents, Pollution effects, Methods of treatment, utilization and disposal, in industries viz. sugar, distillery, dairy, pulp and paper mill, fertilizer, tanning, steel industry, textile, petroleum refining, chemical and power plant.	**09 Hrs.**
Unit 3	**Effluent Quality Standard**: Treat ability aspects of raw industrial wastewater with domestic sewage, Partially treated industrial wastewater with domestic sewage, and Completely treated industrial wastewater with domestic sewage. Stream and Effluent standards	**06 Hrs.**
Unit 4	**Treatment Processes:** Waste volume reduction, Waste strength reduction, Neutralization, Proportioning, Equalization. Reuse and recycling concepts.	**07 Hrs.**
Unit 5	**Industrial waste water treatment techniques**: for removal of specific pollutants in industrial , wastewaters, e.g., oil and grease, cyanide, fluoride, calcium, magnesium, toxic organics, heavy metals, radioactivity.	**08 Hrs.**

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Unit 6	**Effluent treatment plant:** Concept, Objectives, Methodology, Cost benefit analysis, Design, Operation and maintenance.	**06 Hrs.**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Theories and Practices of Industrial waste treatment	Nelson Nemerow	Addison-Wesley	1st	1963
02	Waste Water Treatment	M.N.Rao	CBS Publishers and distributors Pvt. Ltd	3rd	2011
03	Industrial Waste Water	A.D. Patwardhan	Prentice Hall India Learning Private Limited	2nd	2017
04	Wastewater Engineering: Treatment and Reuse	Metcalf and Eddy	McGraw Hill Publication Education.	4th	2017

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Industrial Waste Water	Joseph D. Edwards	CRC Press	1st	1995
2	Industrial Waste Water Pollution Control	W. Eckenfelder	McGraw Hill Publication Education.	3rd	1999
3	The Industrial Waste Water Systems Handbook	Ralph L. Stephenson James B. Blackburn Jr.	CRC Press	1st	1997
4	Water and Waste Water Engineering	Mackenzie L. Davis	McGraw Hill Publication Education.	1st	2017

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B-Tech - CV - 68/89

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	1CVPE321, **Waste Treatment & Pollution Control**
Prerequisite/s	1CVES103, 1CVPC305
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II /ESE	10/30/10/50

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1CVPE321_1	**Explain** the sources, characteristics, and methods of wastewater collection. (K^2)
1CVPE321_2	**Illustrate** the standards and legislations for pollution Control. (K^2)
1CVPE321_3	**Summarize** the various low-cost wastewater treatment units. (K^2)
1CVPE321_4	**Apply** the knowledge of effluent standards for wastewater disposal as per MPCB norms. (K^3)
1CVPE321_5	**Develop** the primary and secondary wastewater treatment units. (K^3)

Course Contents:		**Hrs.**
Unit 1	**Wastewater Treatment:** Necessity of treatment, methods of sewage disposal, types of sewerage systems, and their suitability. Wastewater sources and flow rate, Components of wastewater flow, Variations in flow rates and strength and constituents, Characteristic of Municipal wastewater, Problems on B.O.D. calculations	**07**
Unit 2	**Design of Sewerage System:** Dry weather flow, factors affecting dry weather flow, Estimation of stormwater flow, rational method and empirical formulae of design of stormwater drain, hydraulic formulae for velocity, effects of flow variations on velocity, self-cleansing and non-scouring velocities, design of hydraulic elements for circular sewers flowing full and for partially full. Introduction to software in sewer network design	**07**
Unit 3	**Treatment of Sewage**: Principle, application, and design of following unit operations: **Primary Treatments:** screening, grit chambers, skimming tanks, primary sedimentation tank. **Secondary Treatments:** Activated sludge process, principle, and flow diagram, Modifications, design of ASP, Trickling filter, Novel treatment and Spent wash treatment.	**07**
Unit 4	**Sludge Treatment:** Characteristics, Treatment and disposal, Concept of anaerobic digestion, Fundamental concept of reactors. Sludge drying beds, sludge digestion and filter beds. **Low Cost Treatments:** Waste stabilization pond, Oxidation pond. Wetland and aquatic treatment systems; Types, application. Aerated Lagoon, Oxidation ditch, Sewage Farming Anaerobic Treatment Units- Anaerobic digestor, UASB, Anaerobic Lagoons, Design of Septic tank.	**07**

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Unit 5	**Stream pollution:** Stream Classification, Concept of Self Purification and DO sag curve. Streeter Phelp's Equation. Disposal of wastewater: methods, Effluents standards for stream and land disposal as per MPCB standards and legislation.	**07**
Unit 6	**Recent Advances and Pollution Control:** Water (Prevention and Control of Pollution) Act, 1947, Concept of Environmental Impact Assessment, Air pollution control strategies, Soil Pollution control Strategies	**07**

Text Book:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Sewage disposal and air pollution engineering	S.K.Garg	Khanna publishers	33rd	2015
02	Water Supply & Sanitary Engineering	G. S. Birdie	Dhanpat Rai & Sons, New Delhi	18th	2007
03	Waste Water Treatment, Disposal and Reuse	Metcalf and Eddy Inc.	Tata McGraw Hill Publications	2nd	2000
04	Wastewater Engineering	B.C. Punmia, Jain	Laxmi Publications (P) Ltd	2nd	1998
05	Air pollution	Rao M. N. and Rao H.V.	Tata McGraw Hill	2nd	1990

Reference Book:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Environmental Engineering	Peavy, Rowe and Tchobanoglous;	McGraw-Hill	2nd	2015
02	Industrial Wastewater Treatment, Recycling and Reuse.	Bhandari and Ranade	Elsevier	2nd	2014
03	Water and Waste water Technology	Hammer M.J.	Prentice-Hall of IndiaPrivate Limited	6th	2011
04	Water supply & sanitary engineering	E.W.Stee	Khanna Publishes	2nd	2008
05	Wastewater Treatment for Pollution Control	Arcievala, S.J.	Tata McGraw Hill.	2nd	2000
06	Environmental Engineering	H.S.Peavy, D. R. Rowe	McGraw Hill	2nd	1985
07	Introduction to Environmental Engineering and Science	Masters, G.M.	Prentice Hall of India.	2nd	1998

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TY CV-63183

Course Details:

Class	B. Tech, Sem.-VIII
Course Code and Course Title	1CVPE414, **Industrial Waste Water Treatment**
Prerequisite/s	0CVPC303, 0CVPC309.
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50

Course Outcomes: Upon successful completion of the course, the student should be able to:	
1CVPE414_1	**Explain** basics of industrial waste water and need for treatment
1CVPE414_2	**Classify** various industrial waste water and manufacturing processes
1CVPE414_3	**Discuss** various effluent quality standards for industrial waste water.
1CVPE414_4	**Describe** various industrial waste water treatment techniques
1CVPE414_5	**Explain** recent developments in industrial waste water treatment

Course Contents:

Unit No.	Title	Hrs
Unit 1	**Basics of industrial waste water** : Difference between municipal waste water and Industrial waste water, Water use in industry, Industrial water quality requirements, Deterioration of water quality, Classification and characterization of Industrial wastewater, Monitoring of wastewater flow in industries, Quality and quantity variations in waste discharge, Water budgeting. **Common Effluent Treatment Plant:** Location, Need, Design, Operation & Maintenance Problems	**08**
Unit 2	**Classification of Industrial Waste**: Water usage, Sources, Quantities, and characteristics of effluents, Pollution effects, Methods of treatment, utilization and disposal, in industries viz. sugar, distillery, dairy, pulp and paper mill, fertilizer, tanning, steel industry, textile, petroleum refining, chemical and power plant.	**07**
Unit 3	**Effluent Quality Standard**: Treatability aspects of raw industrial wastewater with domestic sewage, Partially treated industrial wastewater with domestic sewage, and Completely treated industrial wastewater with domestic sewage. Stream and Effluent standards, National River action plan.	**07**
Unit 4	**Treatment Processes:** Waste volume reduction, Waste strength reduction, Neutralization, Proportioning, Equalization. Reuse and recycling concepts.	**07**
Unit 5	**Industrial waste water treatment techniques**: Removal of specific pollutants in industrial , wastewaters, e.g., oil and grease, cyanide, fluoride, calcium, magnesium, toxic organics, heavy metals, radioactivity.	**07**
Unit 6	**Recent developments in industrial waste water treatment:** Biofilm Reactors for Final Treatment of Industrial Wastewater, High Rate Anaerobic Treatment Processes, Polymer Application.	**06**

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B-Tech - CV - 35142

Text Books:					
Sr. No	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
01	Theories and Practices of Industrial waste treatment	Nelson Nemerow	Addison-Wesley	1st	1963
02	Waste Water Treatment	M.N.Rao	CBS Publishers and distributors Pvt. Ltd	3rd	2011
03	Industrial Waste Water	A.D. Patwardhan	Prentice Hall India Learning Private Limited	2nd	2017
04	Wastewater Engineering: Treatment and Reuse	Metcalf and Eddy	McGraw Hill Publication Education.	4th	2017

Reference Books:					
Sr. No	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
01	Industrial Waste Water	Joseph D. Edwards	CRC Press	1st	1995
02	Industrial Waste Water Pollution Control	W. Eckenfelder	McGraw Hill Publication Education.	3rd	1999
03	The Industrial Waste Water Systems Handbook	Ralph L. Stephenson James B. Blackburn Jr.	CRC Press	1st	1997
04	Water and Waste Water Engineering	Mackenzie L. Davis	McGraw Hill Publication Education.	1st	2017

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Course Details:

Class	F. Y. B. Tech, Sem. I
Course Code and Course Title	1CVHS154, **Professional Ethics & Behavioral Science**
Prerequisite/s	-
Teaching Scheme: Lecture/Practical	00/02
Credits	01
Evaluation Scheme: ISE	25

Course Objectives:	
01	Understand the process and importance of Goal Setting in Profession
02	Acquire important and relevant skills of Decision Making
03	Gain Knowledge and importance of Emotions and Emotional Intelligence
04	Get insight into concepts of Attitude and Critical Thinking
05	Achieve competency to manage Stress

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1CVHS155_1	**Find** the importance of Goal Setting in Profession. (K^1)
1CVHS155_2	**Interpret** the importance of right Decision Making Skills. (S^2)
1CVHS155_3	**Explain** the concept of emotions, its types& Emotional Intelligence. (K^2)
1CVHS155_4	**Build** a right attitude and involve wisely in critical thinking. (K^3)
1CVHS155_5	**Identify** stress level, type & Utilize proper stress management techniques. (K^3)

Course Contents:		
Unit 1	Goal Setting – Locke's Goal setting theory, 7 steps of goal setting, SMART goal, +Activity	**2 Hrs.**
Unit 2	Decision Making – Importance of this skill, techniques of Decision-making, +activity	**2 Hrs.**
Unit 3	Emotions – body-emotion connection, emotions and thinking, + activity	**2 Hrs.**
.Unit 4	Emotional Intelligence – definition, components of emotional intelligence, +activity	**2 Hrs.**
Unit 5	Psychology of Attitude – definition, Characteristics, components of attitude, formation of attitude, types of attitude, + activity	**2 Hrs.**
Unit 6	Critical Thinking - The role of emotion, language and curiosity in critical thinking, + activity	**2 Hrs.**
Unit 7	Stress management – I – definition, types of stress, causes, +activity	**2 Hrs.**
Unit 8	Stress management – II symptoms of stress, coping styles, types of coping strategies, Activity	**2 Hrs.**

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F.Y.-CV-16/38

Text Books:					
Sr. No	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
01	Introduction to Psychology	Clifford T. Morgan	Mcgraw Hill Education	4th	2004
02	Behavior Science	Dr.Abha Singh	Willy	1st	2013

Reference Books:					
Sr. No	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
01	Introduction to Psychology	Clifford T. Morgan	Mcgraw Hill Education	4th	2004
02	Behavior Science	Dr.Abha Singh	Willy	1st	2013

~~Course Details~~:

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F·Y·CV-17/38

Course Details:

Class	B. Tech, Sem.-III/IV
Course Code and Course Title	0CSMC212, **Environmental Studies**
Prerequisite/s	--
Teaching Scheme: Lecture	02
Credits	--
Evaluation Scheme: ISE	50

Course Outcomes (COs) Upon successful completion of the course students will be able to:	
0CSMC212_1	**Explain** importance of environmental studies with necessary of acts.(K2)
0CSMC212_2	**Explain** importance of public awareness on environmental problems (K2)
0CSMC212_3	**Write** a technical report in team regarding course and impacts of environment related issues.(S2)
0CSMC212_4	**Discuss** current concern of environment issues.(A2)
0CSMC212_5	**Describe** the need of environment protection and ethics.(A2)

Course Contents:		
Unit No.	**Unit Name**	**Contact Hours**
Unit 1	**Nature of Environmental Studies** Definition, scope and importance. Multidisciplinary nature of environmental studies, Need for public awareness.	02 Hrs.
Unit 2	**Natural Resources and Associated Problems** a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people; b) Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy, f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.	04 Hrs.
Unit 3	**Ecosystems** 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, characteristics features, structure and function of the following ecosystem :- a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem d)Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	04 Hrs.
Unit 4	**Biodiversity and its conservation** Introduction- Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use,	05 Hrs.

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	productive use, social, ethical, aesthetic and option values. India as a mega-diversity nation. Western Ghat as a biodiversity region. Hot-spots of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man-wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
Unit 5	**Environmental Pollution** Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.	04 Hrs.
Unit 6	**Social Issues and the Environment** Disaster management: floods, earthquake, cyclone, tsunami and landslides Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products.	03 Hrs.
Unit 7	**Environmental Protection** From Unsustainable to Sustainable development Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights	06 Hrs

Mini Project	**Mini project based on :** Environmental assets River/Forest/Grassland/Hill/Mountain. OR A local polluted site Urban/Rural/Industrial/Agricultural. OR Study of common plants, insects, and birds. OR Study of simple ecosystems - ponds, river, hill slopes, etc. **(Mini Project report is Mandatory.)**

Assessment Method:

1. Mini Project report – 10 marks
2. ISE question paper format will be Multiple Choice Questions- 40 Marks

Unit No.	Topic Name	Weightage
1	Nature of Environmental Studies.	4 Marks
2	Natural Resources.	7 Marks
3	Ecosystems	7 Marks
4	Biodiversity and its conservation	7 Marks
5	Environmental Pollution	7 Marks
6	Social Issues and the Environment	8 Marks

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Annasaheb Dange College of Engineering and Technology, Ashta

Department of Computer Science &Engineering

Course Details:

Class	S. Y. B. Tech. Semester-III
Course Code and Course Title	1CSMC211, **Environmental Studies**
Prerequisite/s	--
Teaching Scheme: Lecture	02
Credits	--
Evaluation Scheme: ISE	50 (Grade)

Course Outcomes (COs)	
Upon successful completion of the course students will be able to:	
1CSMC211_1	Explain importance of environmental studies with necessary of acts.(K^2)
1CSMC211_2	Explain importance of public awareness on environmental problems (K^2)
1CSMC211_3	Write a technical report in team regarding course and impacts of environment related issues.(S^2)
1CSMC211_4	Discuss current concern of environment issues.(A^2)
1CSMC211_5	Describe the need of environment protection and ethics.(A^2)

Course Contents:

Unit 1: Nature of Environmental Studies

Definition, scope and importance. Multidisciplinary nature of environmental studies, Need for public awareness.

(02Hrs)

Unit 2: Natural Resources and Associated Problems

a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people; b) Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy, f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.

(04Hrs)

Unit 3: Ecosystems

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, characteristics features, structure and function of the following ecosystem :- a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem d)Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

(04Hrs)

Unit 4: Biodiversity and its conservation

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SY-CSE-41/43

Introduction- Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega- diversity nation. Western Ghat as a biodiversity region. Hot-spots of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man- wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
(05Hrs)
Unit 5: Environmental Pollution
Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.
(04Hrs)
Unit 6: Social Issues and the Environment
Disaster management: floods, earthquake, cyclone, tsunami and landslides Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products.
(03Hrs)
Unit 7: Environmental Protection
From Unsustainable to Sustainable development Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights
(06Hrs)

Mini Project	**Mini project based on :** Environmental assets River/Forest/Grassland/Hill/Mountain. OR A local polluted site Urban/Rural/Industrial/Agricultural. OR Study of common plants, insects, and birds. OR Study of simple ecosystems - ponds, river, hill slopes, etc. **(Mini Project report is Mandatory.)**

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Assessment Method:

1. Mini Project report – 05 marks
2. Seminar – 05 marks
3. ISE question paper format will be Multiple Choice Questions- 40 Marks

Unit No.	Topic Name	Weightage
1	Nature of Environmental Studies.	4 Marks
2	Natural Resources.	7 Marks
3	Ecosystems	7 Marks
4	Biodiversity and its conservation	7 Marks
5	Environmental Pollution	7 Marks
6	Social Issues and the Environment	8 Marks

IMPORTANT NOTES:

1. **ISE will be conducted in 14th week of semester.**
2. **Mini Project report will be submitted to course coordinator in 10th week of semester.**
3. **Students should get minimum 40% marks to get PP (PASS) grade.**
4. **Students getting less than 40% marks will be offered NP (NOT PASS) grade.**
5. **To get B. Tech. Degree PP grade in Environmental Studies is mandatory.**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Environmental Studies	Dr. B. S. Chauhan	University Science Press, New Delhi	1st	2008
2	Environmental Studies	Dr. P. D. Raut	S. U. Kolhapur	3rd	2011

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Principals of Environmental Science and Engineering	Raman Sivakumar	Cengage learning Singapore	2	2005
02	Elements of Environmental Science and Engineering	P. Meenakshi	Prentice Hall of India Private Limited, New Delhi	-	2006
03	Environmental Science – working with the Earth	G.Tyler Miller Jr	Thomson Brooks /Cole	11	2006

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SY – CSE – 43/43

Department of Computer Science & Engineering

Course Details:

Class	B. Tech, Sem. V
Course Code and Course Title	**1CSPR356- Mini Project**
Prerequisite/s	-
Teaching Scheme: Practical	2
Credits	1
Evaluation Scheme: ISE /ESE	50/50

Course Outcomes: Students should be able to	
1CSPR356_1	**Identify** specific problem statement from a selected domain.(K^3)
1CSPR356_2	**Analyze** the hardware and/or software requirements of the proposed work (K^4)
1CSPR356_3	**Identify** and use relevant tools and technologies for documentation, designing, coding, testing and debugging the software / hardware pertaining to their major project (K^3)
1CSPR356_4	**Defend** or argue or appraise the results obtained during project work (K^5)
1CSPR356_5	**Design and construct** a software system, component, or process to meet desired needs.(K^6)
1CSPR356_6	**Improve** writing skills to compose project report professionally. (S^3)
1CSPR356_7	**Follow** given instructions during practical performance. (A^2)

Course Contents: **Platforms:** Free and Open source software.	
1	Three students (Maximum) in a group shall carry out a mini project. A batch of practical / shall be divided into mini project groups.
2	Mini project topics and the work for these groups in the batch shall be guided by a teacher for the batch, preferably on one of the topics which is selected by the students in his/her domain.
3	Alternatively, a group may select another topic of relevance in consultation with senior students and teachers.
4	A group shall undertake IBM TGMC (The Great Mind Challenge) projects, past Smart India Hackathon, KPIT Sparkle topic Or the topic related to the courses the students have studied/studying.
5	The teacher shall periodically assess the performance of individual student in the mini project, jointly with a teacher of another batch. This assessment will be used for determining ISE marks of the mini project.
6	Project group shall submit hardcopy of project report along with related code and documentation in soft form at the end of the semester..

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AnnasahebDange College of Engineering and Technology, Ashta
Department of Computer Science & Engineering

Course Details:

Class	B. Tech, Sem. VI
Course Code and Course Title	**1CSHS313- Entrepreneurship Development and Planning**
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial	3/0
Credits	03
Evaluation Scheme: ISE	10/30/10/50

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1CSHS313_1	**Explain** the nature and function of entrepreneurship (K^2)
1CSHS313_2	**Explain** what characterizes an attractive business opportunities and common pitfalls during the entrepreneurial process (K^2)
1CSHS313_3	**Identify** Finance and marketing solutions for Business (K^3)
1CSHS313_4	**Explain** Concept and Characteristics of Small Scale Industry(K^2)
1CSHS313_5	**Develop** Business plan (K^3)

Course Syllabus

Course Contents:		
Unit 1	**Entrepreneur and Entrepreneurship** The Entrepreneur : Definition and Concept, Entrepreneurship : scope in local and global Market, Charms of becoming an intrapreneur/ Entrepreneur. Entrepreneurial Traits, Characteristics and skills, Classification of entrepreneurship, Entrepreneur vs Professional Manager, The role of entrepreneurship in economic development, Concept of entrepreneurship, Theories of entrepreneurship, Forms of Business Ownership, mistakes of entrepreneurship and how to avoid them; entrepreneurial failure. Available Governments schemes to support entrepreneurship promotion like startup India, Mudra Yojana, ATAL Innovation Mission , Software Technology Park (STP) etc.	**08 Hrs.**
Unit 2	**Identification of Business Opportunities** Introduction, An Illustration: choice of product, Project ideas, Scanning of Business Environment and Identifying business idea, Selection of Product/ Service, core competence, product life cycle, new product development process, mortality curve, creativity and innovation in product modification/development. Concept of Project, Importance of Project Identification, Project Profile	**07 Hrs.**
Unit 3	**Sources of Finance** Sources of Finance, identifying the sources of finance; angel investing and venture finance; managing cash flow, Project Financing, Institutional Finance to Entrepreneurs, Financial Intuitions, Role of consultancy organization	**06 Hrs.**
Unit 4	**Marketing** Methods of Marketing, Functions of marketing, Marketing strategies, 5 Essential Steps for a Successful Strategic Marketing Process, Marketing Mix, Marketing Channels, Marketing Institutions and Assistance, E-Commerce, Digital Marketing,	**07 Hrs.**

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Unit 5	**Concept and Characteristics of Small Scale Industry** Introduction, SSI Units, Characteristics of SSI, Importance of Small Enterprise, Advantages of Small-scale Enterprises, Challenges and Opportunities, Role of SSI in economic Development, Components of macro and micro business environment;	**06 Hrs.**
Unit 6	**Business Plan Development** Creativity and Business idea, Legal issues for entrepreneur, protection of intellectual property involving patents, trademarks, and copyrights., Trade secrets, Licensing Creating business plan, Feasibility analysis, Technical or Operational analysis, Production/Operation plan, Organizational Plan, Business model canvas, Guidelines by Planning Commission for Project report, Project report preparation and Evaluation, Starting the venture	**08 Hrs.**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	The Dynamics of Entrepreneurial Development and Management	Vasant Desai	Himalaya Publishing House	6th	2018
02	Small-Scale Industries and Entrepreneurship – In the twenty-first century	Vasant Desai	Himalaya Publishing House	9th	2011

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Entrepreneurship	Dean Shepherd, Michael Peters	Tata McGraw Hill Edition Pvt Ltd	6th	2008
02	Entrepreneurship : Successfully Launching New Ventures	Barringer and Ireland	Pearson	3rd	2006
03	All In Startup : Launching a new Idea when Everything Is on the Line	Diana Kander	Wiley	3rd	2014
04	Disciplined Entrepreneurship : 24 Steps to a Successful Startup	Bill Aulet	Wily	3rd	2013

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Course Details:

Class	B. Tech, Sem. VII
Course Code and Course Title	1CSPR456- **Project Phase I**
Prerequisite/s	Miniproject
Teaching Scheme: Lecture/Tutorial/Practical	0/0/4
Credits	04
Evaluation Scheme: ISE/ESE	50/50

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1CSPR456_1	**Identify** and formulate the real-world problem for their major project in the field of their own interest (K2)
1CSPR456_2	**Survey** technical literature, blogs, documents about latest technological trends etc. to come-up with an innovative idea for technical project (K2)
1CSPR456_3	**Analyze**thehardwareand/orsoftwarerequirementsofthe proposed work (K4)
1CSPR456_4	**Identify** and use relevant tools (from industry) and technologies for documentation, designing, coding, testing and debugging the software / hardware pertaining to their major project (K3)
1CSPR456_5	**Defend** or argue or appraise the results obtained during project work (K5)
1CSPR456_6	**Design** the prototype of the selected idea (K6)
1CSPR456_7	**Exercise** all the managerial (project planning, scheduling) and behavioral skills in a team to accomplish the goals of their project (A3)
1CSPR456_8	**Develop** summarizing, writing, documentation and presentation skills to showcase their ideas in the conferences / journals leading to effective communication. (S3)

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Course Contents:

1. Project Phase I work is to be carried out in the group of three to four students.

   Someone has said that choosing teammates for project is way more significant than choosing life partner. So here you will develop team building skills. On the contrary, students must learn how to adjust with unknown team members and get the work done.

2. Project Phase Iis intended to help the students become better learners and better engineers.

3. The students shall select the project by reviewing the literature in the domain of their interest and with the consultation of the respective supervisor / guide and approval from the department and submit the brief document discussing outline of the project with clear objectives

4. The students are encouraged to acquire and exercise professional skills such as inter-personal communication, presentation skills etc.

5. The students shall be exposed to all the standard tools used in the industry with help of industry experts.

6. The skills that students acquire during pre-project are intended to make them better prepared for accomplishing their Major project with a great success.

7. The students are supposed to learn to manage time to achieve the scheduled milestones of their project work.

8. Students shall be trained on how to get prepared to change their (or company's) plans midway. Adapt and survive.

9. Students should maintain a project log book containing weekly progress of theproject.

10. Duringsemester project will be evaluated progress-wise as per the project calendar provided by thedepartment.

11. The students will prepare a prototype of their work by the end of the semester and it will be showcased along with a technical poster in the event organized by the department.

12. Project Phase I report should be prepared using Latex and submitted in soft and hardform

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ANNASAHEB BANGE COLLEGE OF ENGINEERING & TECHNOLOGY ASHTA 416 301

Course Details:

Class	B. Tech, Sem. VII
Course Code and Course Title	**0CSHS457- Design Thinking**
Prerequisite/s	--
Teaching Scheme: Theory/Practical	0/2
Credits	01
Evaluation Scheme: ISE	50

Course Objectives:	
1.	To familiarize students with design thinking concepts and principles as a tool for innovation
2.	To know the various frameworks used in Design Thinking
3.	To expose the student with state of the art perspectives, ideas, concepts, and solutions related to the design and execution of innovation driven projects using design thinking principles
4.	To explore ways to solve problems from end users' perspective
5.	Provide an authentic opportunity for students to develop teamwork and leadership skills

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
0CSHS457_1	**Develop** a strong understanding of the Design Process and propose a concrete, feasible, viable and relevant innovation project/challenge (K^3)
0CSHS457_2	**Recognize** the latest and future issues / challenges in innovation and apply the design thinking approach to model real world situations (K^3)
0CSHS457_3	**Create** physical prototypes / a visual representation of an idea, test it and present the solution (K^6)
0CSHS457_4	**Develop** and test innovative ideas through a rapid iteration cycle (K^6)
0CSHS457_5	**Develop** Professional skills, leadership and teamwork skills, shouldering responsibilities, motivating co-workers/ team members, building strong networks, resolving conflicts (S^3)
0CSHS457_6	**Exhibit** ethical practices in professional work ethics. (A^5)

Course Contents:		
Expt. No.	**List of Activity**	**Contact Hours**
1	Overview of Design Thinking – What, Why and How? Using a case study	1 Hr
2	Process of Design Thinking Multiple frameworks – TCS 4D, Stanford DT, Cooper Method	1 Hr
3	Discovery - Understanding the problem from users perspective (User Research) - Who are the users?	8 Hrs

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B.Tech-CSE-31/34

	- Goals, motivations, behaviors, pain areas, opportunities - Activities – planning, questionnaire, context of use, interviews	
4	Introduction to Ideation and Prototyping Strategies Envisioning (Defining and Conceptualizing) Story boarding, Ideation, Brainstorming	4 Hrs
5	Prototype Iteration – 1	2 Hrs
6	Prototype Iteration – 2	2 Hrs
7	Introduction to Design Research Strategies and Synthesis	2 Hrs
	Testing with end users, Refinement	

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1.	Understanding Design Thinking, Lean, and Agile	Jonny Schneider	O'Reilly	-	2017
2.	Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days	Jack Knapp and others	Simon & Schuster	-	2009

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1.	Design for How People Think	John Whalen	O'Reilly	-	2019
2.	Change by Design	Tim Brown	HarperCollins	-	2009
3.	Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School	IdrisMootee	Wiley	-	2013
4	Creative Confidence: Unleashing the Creative Potential Within Us All	Kelley, D. & Kelley, T	New York: William Collins	-	2014
5	The Achievement Habit: Stop Wishing, Start Doing, and Take Command of Your Life	Roth, B	Harper Business	-	2015
6	The Design of Business: Why Design Thinking is the Next Competitive Advantage. Boston	Roger, M	Harvard Business Review Press	-	2013

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Department of Computer Science & Engineering

Course Details:

Class	B. Tech, Sem. V
Course Code and Course Title	**1CSMC310 – Technical Writing**
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial	1/1
Credits	-
Evaluation Scheme: -	Grade

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1CSMC310_1	**Apply** knowledge of what goes into the key sections of a report to produce your own report (K3)
1CSMC310_2	**Apply** the skills for abstract writing and summarizing technical documents (S3)
1CSMC310_3	**Communicate**clearly and effectively in written, verbal, visual, and interpersonal contexts. (S3)
1CSMC310_4	**Impart** the ethics in scientific and technical communication (A3)
1CSMC310_5	**Use** various tools for preparing reports, drawing flowcharts, diagrams etc. (S3)
1CSMC310_6	**Evaluate** what a good report looks like (S5)

Course Contents:	
1	Introduction to Technical Writing, Types of Technical Documents
2	Components of Technical Report
3	TOC vs Index, Use of Language and Tense
4	Writing Introduction to the topic, defining problem statement, writing objectives and Limiting the scope
5	Carrying out Literature Survey and identifying research gaps, Citing and referencing
6	Writing Methodology
7	Presenting equations and nomenclature, Figures, diagrams and labelling
8	Reporting results: Graphs and Charts (Gnatt Chart), Tables in Technical Writing
9	Images in Technical Writing and Tools to draw HD images
10	Writing abstract, identifying keywords
11	Writing Conclusion, Future scope, Bibliography and References
12	Ethics in Technical writing, plagiarism, indexing and metrics of journals/proceedings

Note: The assignments will be strictly written/ completed using LATEX

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Technical Report Writing for Engineers	Andrew Garrard	The University of Sheffield		-
02	Technical Writing Essentials		Alison		-
03	Technical Writing		Coursera - Moscow Institute of Physics and Technology		-
04	Handbook of Technical	David A.	Cengage Learning	1st	2008

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	Writing	McMurrey, Joanne Buckley			

Reference Books:					
Sr. No	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Technical Writing – A practical Guide for Engineers and Scientists	Phillip A. Laplante	CRC Press	1st	2015
2	LaTeX		en.wikibooks.org		2016
3	Learn LaTeX		http://www.learnlatex.org/en/		

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TY CSE - 37169

Department of Computer Science & Engineering

Course Details:

Class	B. Tech, Sem. VI
Course Code and Course Title	**1CSPR363- Internship/Intra institute /Inter institute activity**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	--
Credits	01
Evaluation Scheme: ISE	50

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1CSPR363_1	**Make use of** technology for solving real world problem **(K3)**
1CSPR363_2	**Take part in** developing solutions byexamining the situations **(K4)**
1CSPR363_3	**Justify** the solutions for given problem **(K5)**
1CSPR363_4	**Plan and create** the detailed module for proposed solution **(K5)**

Course Contents:

The Internship Program allows T.Y. students to gain practical experience in the workplace before receiving their undergraduate degrees. The internship is a required academic course. The student identifies companies willing to hire him/her on a full time basis for 2 Weeks (80-90 hrs) period (minimum required). The Internship Program supervises the students and awards academic credits (1) upon successful completion of all the required assignments.

After completion of Internship, the student should prepare a comprehensive report to indicate what he has observed and learnt in the training period. The student may contact Industrial Supervisor/ Faculty Mentor/TPO for assigning special topics and problems and should prepare the final report on the assigned topics.

Daily diary will also help to a great extent in writing the industrial report since much of the information has already been incorporated by the student into the daily diary. The training report should be signed by the Internship Supervisor, TPO and Faculty Mentor.

The Internship report will be evaluated on the basis of following criteria:

i. Originality.
ii. Adequacy and purposeful write-up.
iii. Organization, format, drawings, sketches, style, language etc.
iv. Variety and relevance of learning experience.
v. Practical applications, relationships with basic theory and concepts taught in the course.

And/Or

If student has an innovative idea then he/she can work on that idea as step towards a technical Startup. Student is expected to enroll in pre incubation/incubation center to work on his idea.

Activity will be evaluated on the basis of following criteria

i. Market analysis
ii. Business plan/module
iii. IP ownership (Patent Search) etc.

He/she has to prepare a detailed report under guidance of mentor provided by department and submit the report of the activity carried out.

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And/Or

Student is expected to participate in any technical national / international competition like Programming hackathon / Project competition with a significant achievement anytime during the semester during weekends or holidays.

Activity will be evaluated on the basis of following criteria

i. Participation in National / International technical symposium or hackathon/ Programming / Project Competition.
ii. Achievement in the event if any with evidence of certificates
iii. Demonstration of the same work at department with a report of the event and/or project report

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Class	B. Tech, Sem. VIII
Course Code and Course Title	1CSPR457- **Internship* or Institute Project Phase II**
Prerequisite/s	1CSPR456
Teaching Scheme: Lecture/Tutorial/Practical	0/0/27
Credits	8
Evaluation Scheme: ISE/ESE	50/50

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1CSPR457_1	**Identify**, formulate and solve a problem. (K3)
1CSPR457_2	**Analyze** the hardware and/or software requirements of the system (K4)
1CSPR457_3	**Use** different tools available in the market for design, coding, testing and deployment and documentation (K3)
1CSPR457_4	**Design** and construct a hardware and/or software system, component, or process to meet desired requirements of the problem undertaken. (K6)
1CSPR457_5	**Defend** or argue or appraise the results obtained during project work (K5)
1CSPR457_6	**Demonstrate** the developed project / product and its usage to the customers.(K3)
1CSPR457_7	**Develop** summarizing, writing, documentation and presentation skills to showcase their ideas in the conferences / journals leading to effective communication. (S3)
1CSPR457_8	**Exercise** all the managerial (project planning, scheduling) and behavioral skills in a team to accomplish the goals of their project (A3)

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ANANTRAO PAWAR COLLEGE OF ENGINEERING & TECHNOLOGY ASHTA 416 301

B-Tech - CSE - 30/32

Course Contents:

1. Internship* or Institute Project Phase II is the task based work leading to partial or complete solution to a problem identified by industry / institute. This final year project is intended to work on real-world problem solving and hence the students may be allowed to work as interns at various industries or institutes of national importance or the research labs.
2. If the students opt for internships at industry, they will work on the problem statements defined by industry with contribution from internal mentor as well. The students who opt for in-house project will be encouraged to formulate their own ideas to solve the real-world problems in the domain of their interests leading to concrete solution to the problem in the institute premises. OR they can be part of any live ongoing research project in the department. The topics being selected should be from the thrust areas and sub-domains of computer science and engineering. The ideas sponsored by industry to be implemented at institute will also be encouraged. Also, it is advised that the students opting for in-house projects should extend their ideas identified in pre-project phase in semester VII. The promising ideas from the students having potential for startups will be encouraged.
3. Irrespective of Industry sponsored project to be implemented at industry or in-house project, project group will select a project topic with consent from guide and approval from the department and submit the brief document discussing outline of the project with clear objectives. The students are required to undergo literature survey, formulate the problem and propose a methodology to achieve the objectives.
4. Project work should involve analytical, experimental, design or combination of these in the area of Computer Science and Engineering; multi-disciplinary work is also encouraged.
5. Students should maintain a project log book containing weekly progress of the project.
6. The project evaluation committee will evaluate the project throughout the semester. The progress of the project will be monitored and assessed as per the project calendar provided by the department.
7. On completion of the work, students should prepare an article and should submit the same to national / international conference, research symposiums, national / international peer reviewed journals. The students should participate in the project exhibitions / competitions in and outside the institute at state / national level.
8. On completion of the work, a project report should be prepared using Latex and the soft and print copy of the same should be submitted to the department.
9. Students need to undergo all the modes of evaluation scheduled by the department time-to-time.

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B-Tech-CSE-31/32

Class	B. Tech, Sem. VIII
Course Code and Course Title	1CSPR458- **Socio Outreach**
Prerequisite/s	
Teaching Scheme: Lecture/Tutorial/Practical	0/0/0
Credits	1
Evaluation Scheme: ISE	50

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1CSPR458_1	**Contribute** in various social activities with effective interpersonal, communication skills.
1CSPR458_2	**Showcase**social, professional and ethical responsibilities to help / assist the needy.
1CSPR458_3	**Make use of**technical skills to provide awareness about digital literacy.
1CSPR458_4	**Build** foundation to work for environmental sustainability.
1CSPR458_5	**Develop** understanding of working with people of diversity including age, gender, race, ethnicity, religion without discrimination.

Institute organizes extensive programs of social outreach activity, including on-campus and off-campus social awareness workshops, competitions and donation drives. These activities aim to raise awareness of the vital role that engineering has in our society. The students always participate in such activities throughout the tenure of undergraduate program at institute. This course is included to encourage and reward the students to volunteer and participate in the various Social Outreach Programs.

Based on their participation and contribution towards social activities the students will be evaluated for this course on submitting evidences of their work.

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ANNASAHEB DANGE COLLEGE OF ENGINEERING & TECHNOLOGY ASHTA 416 301

Course Details:

Class:	B.Tech Semester VII
Course Code and Course Title:	0FTPC451 **Food Biotechnology Laboratory**
Prerequisite/s:	Food Microbiology
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes: After completion of this course students will be able to	
0FTPC451_1	Apply the knowledge of mutational theory
0FTPC451_2	Isolation and separation of DNA and proteins.
0FTPC451_3	Handle tools and equipment used for various biotechnology experiments
0FTPC451_4	Analyze the food sample using the biotechnological tools
0FTPC451_5	Generate biomass from food waste
0FTPC451_6	Degrade the food sludge using microbial culture

Course Contents:

Exp. No	**Title of Experiment**
1	Micropropagation through Tissue Culture
2	Strain Improvement through UV Mutation for Lactose Utilization
3	Chemical mutagenesis using chemical mutagens
4	Isolation of DNA from bacterial cell
5	Separation of protoplast using cellulytic enzymes
6	Immobilizing cells using alginate solution
7	Production of biomass from kitchen waste
8	SDS-PAGE for food analysis
9	Use of chromatographic technique to separate dyes
10	ELISA test
11	Agarose gel electrophoresis for DNA separation
12	Pesticide degradation by pseudomonas species

Text Booksand references:

Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Biotechnology procedures and experiments handbook	S.Harisha	Laxmi Publications Pvt. Ltd	--	2008
2	Food Biotechnology Practical Manual	Stuart Smith	Deakin University	--	2010

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B-Tech- FT-15141

Course Details:

Class:	B.Tech Semester VII
Course Code and Course Title:	0FTPC452 **Process Instrumentation and Control Laboratory**
Prerequisite/s:	Unit Operations, Food Engineering-I, Food Engineering-II
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes: After completion of this course students will be able to	
0FTPC452_1	Illustrate the different methods for the measurement of process parameters
0FTPC452_2	Elucidate the construction and working of various industrial devices used to measure pressure, temperature and flow
0FTPC452_3	Explicate the construction and working of various industrial devices used to measure level, vibration, viscosity and humidity
0FTPC452_4	Analyze, formulate and select suitable sensor for the given industrial applications
0FTPC452_5	Apply the mathematical basis for the design of control systems
0FTPC452_6	Specify the required instrumentation and final elements to ensure that well-tuned control is achieved

Course Contents:	
Exp. No	**Title of Experiment**
1	Measurement of basic quantities using static and dynamic instruments
2	Measurement of temperature thermocouple and pyrometer.
3	Measurement of pressure using Bourdon gauge.
4	Measurement of liquid level through differential method.
5	Measurement of flow through venture meter.
6	Calibration of rotameter.
7	Determination of relative humidity using wet and dry bulb temperature method.
8	Measurement of viscosity by drop method.
9	Measurement of pH value.
10	Study of controllers.
11	**Project 1:** Development of temperature sensors
12	**Project 2:** Development of level sensors

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Principles of Industrial Instrumentation	Patranabis, D.	Tata McGraw Hill Publishing Company	2nd	1999
2	Industrial Instrumentation	Eckman, D. P.	Wiley Eastern Ltd.	-	2004
3	Process Control	Johnson C.D.	Prentice Hall of	8th	2014

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B-Tech-FT-16/41

	Instrumentation Technology		India.		
4	Fundamentals of Industrial Instrumentation and Process Control	Dunn, W.C.	Tata McGraw-Hill Education Private Limited	1st	2009

Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Transducers and Instrumentation	Murty, D.V.S.	Prentice Hall of India.	2nd	2008
2	Process system analysis and control	Donald, R.C. and LeBlanc, S.E.	McGraw-Hill	3rd	1990
3	Chemical process control: an introduction to theory and practice	Stephanopoulos, G.	Prentice-Hall	-	1984
4	Industrial Control and Instrumentation	Bolton, W L.	Universities Press	-	1991

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B-Tech - FT-17|41

Course Details:

Class:	B.Tech Semester VIII
Course Code and Course Title:	0FTPE453 **Biochemical Engineering Laboratory**
Prerequisite/s:	Principles of Food Preservations, Food Microbiology
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes: After completion of this course students will be able to	
0FTPE453_1	Demonstrate the use of different parameters of the fermenter
0FTPE453_2	Perform tests to understand the enzyme activity of the product
0FTPE453_3	Evaluate the different stages of microbial growth
0FTPE453_4	Use enzymes to carry out different processes
0FTPE453_5	Illustrate the different types of fermentations
0FTPC453_6	Develop a fermented product

Course Contents:	
Exp. No	**Title of Experiment**
1	Instrumentation and their control in fermentation industry - physical parameter
2	Instrumentation and their control in fermentation industry – chemical parameter,
3	To study the different parts and operation of laboratory fermentors
4	To study the thermal stability of peroxidase enzyme in potato
5	To assess the amylase activity from given foods sample
6	To measure the microbial growth during fermentation
7	Digestion of protein into amino acid
8	Starch hydrolysis by amylase
9	Batch submerged fermentation of baker's yeast in a shaker flask
10	Wine fermentation of fruit juices
11	To study the time temperature relationship for destruction of microorganisms
12	To study the ethyl alcohol production through bioconversion

Text Books and References:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Biochemical Engineering A Laboratory Manual	Das-Das	Routledge	1st	2021

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B-Tech -FT-18141

Course Details:

Class:	B.Tech, Semester VIII
Course Code and Course Title:	0FTPE454 **Wealth from Food Waste laboratory**
Prerequisite/s:	Principles of Food Preservations
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPE454_1	Analyze and compare Waste water and treated water
0FTPE454_2	Minimize and control waste generation and environment pollution
0FTPE454_3	Extraction of value-added products from waste
0FTPE454_4	Modify process of manufacturing to lower the waste

Course Contents:

Exp. No.	Title of Experiment
1	Identification of useful products from agricultural waste and food processing waste
2	Estimation of COD, BOD, TDS, sludge value of effluent and treated water
3	Fat, oil and grease content, heavy metal contents of effluent and treated water
4	Extraction of oilseed or cake proteins
5	Extraction of pectin from waste of fruits
6	Extraction of banana fiber
7	Extraction of lycopene from tomato waste
8	Extraction of oil from wheat germ
9	Oil extraction from different waste
10	Preparation of beverages from whey
11	Project 1 – Value added product preparation from waste
12	Project 2 – Industrial visit (ETP Plant)

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Waste Management for the Food Industries	Ioannis Arvanitoyannis		1st Edition	2007
2	Food Processing Waste Management: Treatment and Utilization Technology	V.K. Joshi (Editor)			2011
3	Principles of Food Sanitation.	Marriott PhD Norman G.		5th Edition	2006

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		and Gravani Robert B.			
4	Postharvest Technology of Fruits and Vegetables: Handling, Processing, Fermentation and Waste Management.	Verma L.R. and Joshi V.K.	Indus Publishing Co. New Delhi		2000
5	Solid Waste Management in Developing Countries.	Bhide A. D. and Sundaresan B. B.			2010
6	Handbook of Solid Waste Management.	Tchobanoglous George and Kreith Frank			2002

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Course Details:

Class	B.Tech Semester VII
Course Code and Course Title	0FTPR456 – Project (Phase-I)
Prerequisite/s	Mini project, Minor Project
Teaching Scheme: Practical	04
Credits:	02
Evaluation Scheme: ISE/ESE	50/50

Course Outcomes: After completing this course students will be able to	
0FTPR456_1	Apply knowledge of food engineering
0FTPR456_2	Design problem statement
0FTPR456_3	Carry out material and energy balance calculations of selected problem
0FTPR456_4	Use modern tools to solve problem
0FTPR456_5	Prepare a project report
0FTPR456_6	Present the solution of problem effectively

Sr. No.	**Guidelines/steps to complete Mini Project**
1	Identify the problem related to food process industry with the help of supervisor/guide
2	Design the problem statement by applying the knowledge of basic Food Technology/Engineering courses
3	Carry Out Literature Survey
4	Design the experiments/methodology
5	Carry out experimentation/simulation
6	Analyze the Results
7	Compare with standards available in literature
8	Prepare report
9	Present project idea in National/International conference

Text/Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	How to Write Dissertations & Project Reports	Dr Kathleen McMillan, D r Jonathan Weyers	Pearson Education Limited	--	2012
2	Dissertations and Project Reports: A Step by Step Guide	Stella Cottrell	Palgrave Macmillan	--	2014
3	Tips For Project Report Writing For Engineering All Streams	Virendra Dilip Thoke	FSP Media Publications	--	2018

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Course Details:

Class:	B. Tech, Semester VIII
Course Code and Course Title:	0FTPC457 **Process Equipment Design Laboratory**
Prerequisite/s:	Process calculations, Unit Operations
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes: After completion of this course students will be able to	
0FTPC457_1	Implement standard symbols of process flow diagrams.
0FTPC457_2	Assess basics of process equipment design and important parameters of equipment design
0FTPC457_3	Impart the knowledge of mechanical aspects of pressure vessel design
0FTPC457_4	Apply mechanical design specifications in to fabrication drawings for plant erection.
0FTPC457_5	Draw detailed dimensional drawings include sectional front view, Full Top/side view depending on equipment.
0FTPC457_6	Analyze loadings, failure modes for process equipment design

Course Contents:	
Exp. No	**Title of Experiment**
1	Design of pressure vessel
2	Design of shell and tube heat exchangers and plate heat exchanger
3	Design of sterilizers and retort
4	Design of single and multiple effect evaporators
5	Design of rising film and falling film evaporator
6	Design of crystallizer
7	Design of dryers
8	Design of extruders
9	Design of Fermenters
10	Design of drive systems
11	**Project 1:** Design and fabricate model of fermentor
12	**Project 2:** Design and fabricate model of dryer

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Process Heat Transfer: Principles and Applications	Serth, R.W.	Elsevier Ltd.	-	2007
2	Joshi's Process Equipment Design	Mahajani, V.V. and Umarji, S.B.	Macmillan Publishers	4th	2009

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3	Process Equipment Design	Dawande S. D.	Denett & Co	7th	2015

Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Coulson & Richardson's Chemical Engineering series: Chemical Engineering Design	Sinnott, R. K.	Elsevier Butterworth-Heinemann.	4th	2005
2	Process Equipment Design	Brownell, L.E. and Young, E.H.	John Wiley& Sons	-	2009
3	Handbook of Food Processing Equipment	Saravacos, G. and Kostaropoulos, A.E.	Springer International Publishing	2nd	2015
4	Process Equipment and Plant Design	Ray, S. and Das, G.	Elsevier Ltd.	1st	2020

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Course Details:

Class:	B. Tech, Semester VIII
Course Code and Course Title:	0FTPE458 **Design & Development of Special Foods laboratory**
Prerequisite/s:	Food chemistry, Food Nutrition, Food Additives & Ingredients.
Teaching Scheme: Practical	**02**
Credits:	01
Evaluation Scheme: ISE / ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPE458_1	Evaluate the basic organic farming conditions
0FTPE458_2	Design the primary processing Special food.
0FTPE458_3	Apply the processing equipment to special food.
0FTPE458_4	Demonstrate the different types of Special foods products.
0FTPE458_5	Prepare and examine the Therapeutic foods.
0FTPE458_6	Improve the shelf life of Specific consumer-oriented foods.

Course Contents:
Minimum 8 experiments from following list and one course project

Exp. No.	Title of Experiment
1	Evolution of food cultivated under organic farming conditions
2	Preparation of speciality foods based onFunctionality.
3	Preparation of speciality foods based onConvenience.
4	Preparation of speciality foods based onLow cost/ Nutritional purpose.
5	Preparation of speciality food using locally available foods crops, fruit and vegetables few products
6	Assessment of byproduct for preparation of value added speciality food
7	Preparation of special food for the diabetic patients.
8	Preparation of speciality food as per requirement ofLocation.
9	Preparation of speciality food as per requirement Nature of work
10	Preaparation of nutritious protein content food
11	Project-1: Preparation of space food
12	Project-2:Preparation of food for the malnutrius .

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	Food Science	Potter	CBS Publishers & Distributors	Fifth	2007
2.	Processed Protein Food Stuffs	Alchule	Academic Press	First	1958
3.	Food and Nutrition	M.Swaminathan	Bappco	Second	

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Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1.	Therapeutic Diets	-	NIN	-	-
2.	Supplementary Foods	-	NIN	-	-

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B-Tech-FT-35141

Course Details:

Class:	B.Tech, Semester VIII
Course Code and Course Title:	0FTPE459 **Food Allergies Laboratory**
Prerequisite/s:	Principles of Food Preservations
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPE459_1	Analyze the allergens in food
0FTPE459_2	Develop Functional food for food allergy
0FTPE459_3	Detect the different food allergens
0FTPE459_4	Create allergen free food products

Course Contents:

Exp. No.	Title of Experiment
1	Development of gluten free Cake
	Development of gluten free Biscuits
2	Detection of tomato allergens
3	Measurement of gluten contamination in foods
4	To study detection of soy residues in food
5	To study detection egg allergen
6	To study Detection of shell fish toxins with surface Plasmon resonance
7	To study Assessing the allergenicity of products from GM plants
8	To study Detection of mustard allergens and markers in food
9	To study Assessing the allergenicity of products from GM animals
10	To study Development of functional food with anti-food allergic activities
11	Project 1 Survey
12	Development of special food for different allergens

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Handbook of Food Allergen Detection and Control	Simon Flanagan	Elsevier Science	-	2014
2	The Allergen-Free Baker's Handbook	Cybele Pascal	Ten Speed press	-	2009

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B.Tech-FT-36141

Course Details:

Class	B.Tech Semester VIII
Course Code and Course Title	0FTPR461 **Project (Phase-I)/Internship**
Prerequisite/s	Mini project, Minor Project, Project (Phase-I)
Teaching Scheme: Practical	10
Credits:	05
Evaluation Scheme: ISE/ESE	50/100

Course Outcomes: After completing this course students will be able to	
0FTPR461_1	Apply knowledge of food engineering
0FTPR461_2	Design problem statement
0FTPR461_3	Carry out material and energy balance calculations of selected problem
0FTPR461_4	Use modern tools to solve problem
0FTPR461_5	Prepare a project report
0FTPR461_6	Present the solution of problem effectively

Sr. No.	**Guidelines/steps to complete Mini Project**
1	Identify the problem related to food process industry with the help of supervisor/guide
2	Design the problem statement by applying the knowledge of basic Food Technology/Engineering courses
3	Carry Out Literature Survey
4	Design the experiments/methodology
5	Carry out experimentation/simulation
6	Detailed Analysis of experimental/simulated results
7	Compare with standards available in literature
8	Prepare report
9	Present findings in National/International Conference/Journals

Guidelines for internship

Students should undergone internship in food process industry for minimum period of 90 days.
During the internship, students should report to concern authorities from industry and faculty advisor assigned by department on regular basis.
After completion of internship, students should collect internship completion certificate and prepare report based on learning from internship and submit to department for evaluation.
The internship report will be considered as Project (Phase-II) report.
Oral examination/presentation will be conducted during practical examination.
Note: Students opting internship option has to complete theory courses through MOOCs/Online mode and complete the requirement of laboratory courses.

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Text/Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	How to Write Dissertations & Project Reports	Dr Kathleen McMillan, D r Jonathan Weyers	Pearson Education Limited	--	2012
2	Dissertations and Project Reports: A Step by Step Guide	Stella Cottrell	Palgrave Macmillan	--	2014
3	Tips For Project Report Writing For Engineering All Streams	Virendra Dilip Thoke	FSP Media Publications	--	2018

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B-Tech-FT-38141

Course Details:

Class	B. Tech, Semester VIII
Course Code and Course Title	0FTMC462 **Constitution of India**
Prerequisite/s	--
Teaching Scheme: Lecture	02
Credits	2
Evaluation Scheme: MSE / ESE	50/50 (Audit)

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
0FTMC462_1	Explore the basic features and modalities about Indian constitution
0FTMC462_2	Differentiate the functioning of Indian parliamentary system at the center and state level
0FTMC462_3	Describe different aspects of Indian Legal System and its related bodies
0FTMC462_4	Discuss different laws and regulations related to engineering practices
0FTMC462_5	Correlate role of engineers with different organizations and governance models

Course Contents:		
Unit 1	**Constitution:-** Structure and Principles Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947, Enforcement of the Constitution Meaning and importance of Constitution Making of Indian Constitution – Sources Salient features of Indian Constitution. Preamble.	**04 Hrs**
Unit 2	**Fundamental Rights and Directive Principles:-** **Fundamental Rights:** Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, Right to Constitutional Remedies **Fundamental Duties:** Directive Principles-Definition, State to secure a social order for the promotion of welfare of the people, Certain principles of policy to be followed by the State,Equal justice and free legal aid, Right to work, to education and to public assistance in certain cases ,Provision for just and humane conditions of work and maternity Living wage, etc., for workers, Participation of workers in management of industries etc.	**04 Hrs**
Unit 3	**Union Executive and State Executive** Powers of Indian Parliament Functions of Rajyasabha, Functions of Loksabha, Powers and Functions of the President, Powers and Functions of the Prime Minister, Lokpal, Lokayukta. State Executives-Powers and	**06 Hrs**

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B. Tech -FT-39/41

	Functions of the Governor, Powers and Functions of the Chief Minister, Functions of State Cabinet, Functions of State Legislature	
Unit 4	**The Judiciary:** Features of judicial system in India Supreme Court –Establishment and constitution of Supreme Court Salaries, etc., of Judges Appointment of acting Chief Justice Appointment of ad hoc judges Attendance of retired Judges at sittings of the Supreme Court Supreme Court to be a court of record Seat of Supreme Court Original jurisdiction of the Supreme Court ,High Court – Structure and jurisdiction, Attorney general of india.	**06 Hrs**
Unit 5	**Regulation to Information:** Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act The Limited Liability Partnership Act, 2008. Companies Act 2013.The Central Goods and Services Tax **Act**, 2017	**04 Hrs**
Unit 6	**Business Organizations and E-Governance** Sole Traders, Partnerships Companies: The Company's Act: Introduction, Formation of a Company, Memorandum of Association, Articles of Association, Prospectus, Shares, Directors, General Meetings and Proceedings, Auditor, Winding up. E-Governance and role of engineers in E-Governance, Need for reformed engineering serving at the Union and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in a few states creating hurdles in Industrial development.	**04 Hrs**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	The Constitution Of India	Dr. B. R. Ambedkar	Law literature Publications	--	2020
02	Introduction to the Constitution of India	Durga Das Basu	Gurgaon; LexisNexis	23rd	2018
03	Governance in India	M. Laxmikanth	Mc Graw Hill Publications Delhi	3rd	2021
04	The Constitution of India	P.M. Bakshi	LexisNexis	--	2019

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Introduction to the Constitution of India	Durga Das Basu	Gurgaon; LexisNexis	23rd	2018
02	The Constitutional Law of India,	. J.N. Pandey	Allahabad; Central Law Agency	55th	2018
03	. Constitution of India	India.gov.in	National Portal of	--	--

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ANNASAHEB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY, ASHTA
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F.Y. B. Tech (Food Technology)

Course Details

Class	B. Tech, Semester-II
Course Code and Course Title	0FDHS111. **Professional Communication**
Prerequisite/s	12th std English Grammar
Teaching Scheme: Lecture/Tutorial/Practical	02/00/02
Credits	03
Evaluation Scheme: ISE	50

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
0FDHS111_1	**Strengthen** his communicative competence and able to achieve considerable success in English Language competency tests such as IELTS.
0FDHS111_2	**Solve** the exercise related to Reading comprehension and Listening comprehension.
0FDHS111_3	**Prepare** and modify his portfolio considering own strength, weakness and career opportunities.
0FDHS111_4	**Construct** grammatically sound and meaningful sentences necessary for effective communication.
0FDHS111_5	**Compose** relevant professional letters and able to maintain official correspondence.
0FDHS111_6	**Strengthen** his communicative competence and able to achieve considerable success in English Language competency tests such as IELTS.

Course Contents		Hrs.
Unit 1	**Goal Setting and Portfolio** Testing my competence in professional English (IELTS diagnostic test) , Analysis of all four bands, Introducing my Portfolio. Achieving my goals, Exploring my career opportunities, Challenging my assumptions, Planning my Career, Presenting my career choices	**16**
Unit 2	**Grammar and Vocabulary** Checking my English communication competence (IELTS test I - all four bands), Building up my word power, Beginning to write and speak like a professional , Getting better at using good sentences , How to avoid common errors	**08**
Unit 3	**Listening band activities** Listening like a Professional Listening for answers	**06**
Unit 4	**Reading band activities** Getting better at reading professional literature - The Professional, Getting even smarter with technical texts , Checking my English communication competence (IELTS test II - all four bands)	**08**

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Unit 5	**Writing band activities** Becoming skilled in writing professional correspondence, Analysing my skills in reading and writing technical/scientific texts , Becoming a competent researcher Getting smart with technical descriptions of charts/images and technical processes	**10**
Unit 6	**Speaking band activities** How to prepare and present my research review like a professional. Putting my research into words: writing a technical review. How good is my professional English? (IELTS test)	**08**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Cambridge Guide to IELTS	Pauline Cullen, Amanda French	Cambridge University Press	Reprint	2017
02	Ultimate Guide to IELTS Writing	Parthesh Thakkar	M K Books	Reprint	2013
03	Target Band 7	Braverman Simone	Paperback	Third	2018
04	The Professional: Defining the New Standard of Excellence at Work	Subroto Bagchi	Penguin Books India Pvt. Ltd.	Revised Edition	2011

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	High-school English Grammar and Composition	Wren and Martin	S. Chand and Co., New Delhi	1st	2015
02	Grammar for IELTS	Diana Hopkins, Pauline Cullen	Cambridge University Press	First	2018
03	Vocabulary for IELTS	Pauline Cullen	Cambridge University Press	First	2013

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Course Details:

Class	S.Y.B.Tech. Semester-III
Course Code and Course Title	0FTMC206 - Environmental Studies
Prerequisite/s	--
Teaching Scheme: Lecture	02
Credits	--
Evaluation Scheme: ISE	50 (Grade)

Course Outcomes (COs): Upon successful completion of the course students will be able to:	
0FTMC206_1	Explain importance of environmental studies with necessary of acts
0FTMC206_2	Explain importance of public awareness on environmental problems
0FTMC206_3	Write a technical report in team regarding course and impacts of environment related issues
0FTMC206_4	Discuss current concern of environment issues
0FTMC206_5	Describe the need of environment protection and ethics

Course Contents:		**Hrs.**
Unit 1	**Nature of Environmental Studies** Definition, scope and importance. Multidisciplinary nature of environmental studies, Need for public awareness.	**02**
Unit 2	**Natural Resources and Associated Problems** a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people; b) Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy, f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.	**04**
Unit 3	**Ecosystems** 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, characteristics features, structure and function of the following ecosystem :- a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem d)Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	**04**
Unit 4	**Biodiversity and its conservation** Introduction- Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a	**05**

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	mega- diversity nation. Western Ghat as a biodiversity region. Hot-spots of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man- wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
Unit 5	**Environmental Pollution** Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.	**04**
Unit 6	**Social Issues and the Environment** Disaster management: floods, earthquake, cyclone, tsunami and landslides Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products.	**03**
Unit 7	**Environmental Protection** From Unsustainable to Sustainable development Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights	**06**

Mini Project	**Mini project based on :** Environmental assets River/Forest/Grassland/Hill/Mountain. OR A local polluted site Urban/Rural/Industrial/Agricultural. OR Study of common plants, insects, and birds. OR Study of simple ecosystems - ponds, river, hill slopes, etc. **(Mini Project report is Mandatory.)**

Assessment Method:

1. Mini Project report – 05 marks
2. Seminar – 05 marks
3. ISE question paper format will be Multiple Choice Questions- 40 Marks

Unit No.	Topic Name	Weightage
1	Nature of Environmental Studies.	4 Marks
2	Natural Resources.	7 Marks
3	Ecosystems	7 Marks
4	Biodiversity and its conservation	7 Marks
5	Environmental Pollution	7 Marks
6	Social Issues and the Environment	8 Marks

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IMPORTANT NOTES:

1. **ISE will be conducted in 14th week of semester.**
2. **Mini Project report will be submitted to course coordinator in 10th week of semester.**
3. **Students should get minimum 40% marks to get PP (PASS) grade.**
4. **Students getting less than 40% marks will be offered NP (NOT PASS) grade.**
5. **To get B. Tech. Degree PP grade in Environmental Studies is mandatory.**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Environmental Studies	Dr. B. S. Chauhan	University Science Press, New Delhi	1st	2008
2	Environmental Studies	Dr. P. D. Raut	S. U. Kolhapur	3rd	2011

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Principals of Environmental Science and Engineering	Raman Sivakumar	Cengage learning Singapore	2	2005
02	Elements of Environmental Science and Engineering	P. Meenakshi	Prentice Hall of India Private Limited, New Delhi	-	2006
03	Environmental Science – working with the Earth	G.Tyler Miller Jr	Thomson Brooks /Cole	11	2006

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ST-FT-14/42

Course Details:

Class:	S.Y.B.Tech, Semester– III
Course Code and Course Title:	0FTPC252 - Food Microbiology Laboratory
Prerequisite/s:	--
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPC252_1	Carry out isolation, characterization of various microbes associated with foods and food groups
0FTPC252_2	Investigate microbiological techniques of different food groups
0FTPC252_3	Examine the pathogens in foods.
0FTPC252_4	Analyze the microbiological effect on different types of food commodities
0FTPC252_5	Describe the characteristics of food borne, waterborne and spoilage microorganisms,
0FTPC252_6	Explain the methods for their isolation, detection, and identification

Course Contents:	
Exp. No.	**Title of Experiment**
1	Study of instruments used for microbiology, cleaning, and sterilization of glassware.
2	Preparation of media, techniques of incubation
3	Staining methods (monochrome staining, gram staining, flagella staining, capsule staining, and endo spore staining)
4	Pure culture techniques (streak plate/pour plate)
5	Isolation of molds from foods, microbial examination of cereal and cereal products
6	Microbial examination of fruits and vegetables.
7	Microbial examination of milk and milk products,
8	Microbial examination of meat and meat products.
9	Microbial examination of water
10	Microbial examination of fermented food.
11	Project-1: Studies on Preservation Techniques of Foods
12	Project-2: Studies in Fermented Foods

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Food Microbiology	M.R. Adams, M.O.Moss	Royal society of chemistry	3rd	2008
2	Food Microbiology	Frazier, W.C., and Westhoff, D.C.	McGraw-Hill, New York.	4th	1988
3	Modern Food Microbiology	Jay, J. M.	Chapman & Hall. New York, N.Y.	6th	2000

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Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Laboratory Manual of Food Microbiology	Neelima Garg, K. L. Garg, K. G. Mukerji	I K International Publishing House	1st	2010
2	Food Microbiology: A Laboratory Manual	Ahmed E. Yousef, Carolyn Carlstrom	John Wiley & Sons.	1st	2003
3	Essentials of the Microbiology of Foods.	Mossel, D.A.A., Corry, J. E. L., Struijk, C. B., and Baird, R. M.	John Wiley & Sons. New York, NY	1st	1995

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ST-FT-18/42

Course Details:

Class:	S.Y.B.Tech Semester III
Course Code and Course Title:	0FTPC253 - Food Engineering-I Laboratory
Prerequisite/s:	--
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes: After successful completion of this course, students will able to	
0FTPC253_1	Apply concepts of Conduction to given heat transfer system
0FTPC253_2	Calculate heat transfer coefficient in case of convection
0FTPC253_3	Calibrate heat measuring instrument
0FTPC253_4	Evaluate heat transfer due to radiation
0FTPC253_5	Handle heat transfer equipments
0FTPC253_6	Analyze heat exchangers

Course Contents:
Minimum 8 experiments from following list and one course project

Exp. No.	Title of Experiment
1	Study of heat transfer analysis during conduction.
2	Study of heat transfer through composite wall.
3	Determination of thermal conduction of liquid food.
4	Study of heat transfer by natural/Forced convection apparatus.
5	Preparation and calibration of thermocouples.
6	Study of radiation heat transfer through Stefan Boltzmann's apparatus.
7	Study of principle and working of shell and tube heat exchanger.
8	Study of heat transfer rate in plate heat exchanger.
9	Determination of heat transfer through agitated vessel apparatus.
10	Study of principle and working of double pipe heat exchanger.
11	Project-1:
12	Project-2:

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	Handbook of food engginering	Dennis R. Heldman.	CRC Press	2nd	2007
2.	Heat transfer	Alan Jesse chapman	Macmillan Publishers Limited.	4th	1984
3.	Introduction to Food Engineering,	R. Paul Singh and Dennis R. Heldman.	Elsevier, Amsterdam, The Netherlands.	5th	2014.

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Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1.	Heat transfer	J.P Holman	McGraw Hill	10^{th}	2008
2.	Handbook of heat transfer	Warren M.Rohsenow,james P.Hartnett	McGraw Hill	3^{rd}	1998

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ST-FT-20/42

Course Details:

Class:	S.Y.B.Tech, Semester - IV
Course Code and Course Title:	0FTHS212 - Psychology
Prerequisite/s:	-
Teaching Scheme: Lecture/Tutorial	01/00
Credits:	01
Evaluation Scheme: ISE I /MSE/ISE II/ESE	25/00/25/00

Course Outcomes: After completing this course students will be able to	
0FTHS212_1	Elaborate the basics of psychology and its importance at workplace
0FTHS212_2	Analyze the emotional states and its effects on body and behavior
0FTHS212_3	Differentiate leadership styles and its importance in an industry
0FTHS212_4	Apply the concept of emotional intelligence at work
0FTHS212_5	Analyze the communication style based on transactional analysis

Course Contents:		**Hrs.**
Unit 1	**Introduction** to Psychology , definition, fields in psychology, Introduction to industrial and organizational psychology	**02**
Unit 2	**Personality and Emotions** 'Big-five' Model, Personality attributes, matching personalities and jobs Emotions, types of emotions, Emotions- body connection, Emotions-Behavior connection	**03**
Unit 3	**Leadership, characteristics of effective leader,** styles of leadership, Trust and Leadership	**03**
Unit 4	**Emotional Intelligence at work**, Emotional Intelligence: The Concept Emotional Skills that Managers should Learn, Emotional Intelligence and Your Personality	**03**
Unit 5	**Transactional analysis**, Ego types, The four life positions, T.A. and communication	**03**

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Introduction to Psychology	C.T.Morgan R.A. King J.R. Weisz J. Schopler	*McGraw Hill*	7th	2001
2	Emotional Intelligence for Leadership	Jonatan Slane	-	-	2019
3	Essentials of organizational Behavior	Stephen P. Robbins	Prentice Hall	7th	2002

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4	Emotional Intelligence at Work A Professional Guide	Dalip Singh	Sage Publications	3rd	2006
5	I'm ok – You're OK	T.A. Harris	New York Times	5th	2012

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Course Details:

Class:	S.Y.B.Tech, Semester - III
Course Code and Course Title:	0FTES254 – Fluid Mechanics Laboratory
Prerequisite/s:	--
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTES254_1	Understand basic units of measurement, convert units and utilize basic measurement techniques of fluid mechanics.
0FTES254_2	Demonstrate practical understanding of various equation of Bernoulli
0FTES254_3	Apply the suitable hydraulic or pneumatic components for a specific fluid power application
0FTES254_4	Study the performance characteristics of pumps
0FTES254_5	Develop skills related to fluid flow handling e.g. volumetric flow rate measurement, fluid pressure measurement etc
0FTES254_6	Analyze principles and operations of various flow measurement devices

Course Contents:
Minimum 8 experiments from following list and one course project

Exp. No.	Title of Experiment
1	Study of Centrifugal Pump
2	Verification of Bernoulli's Theorem
3	Calibration of Venturimeter
4	Calibration of Orificemeter
5	Determination of Hydraulic Coefficients of Orifice
6	Calibration of Measuring Tank
7	Study and demonstration of Pressure Measuring Devices
8	To study the properties of Newtonian and Non- Newtonian fluids
9	Reynold's experiment
10	Flow through spiral coils
11	Project-1: Model on the hydraulic lift experiment
12	Project-2: Model on centrifugal pump

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	Fluid Mechanics	Yunus A. Cenegal	Tata McGraw-Hill Education	1st	2004
2.	Fundamentals of fluid mechanics	Bruce R. Munson, Alric P. Rothmayer, Theodore H.	Wiley	6th	2009

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		Okiishi, Wade W. Huebsch			
3.	Fluid mechanics and hydraulic machines _ problems and solutions	K. Subramanya	Tata McGraw Hill)	1st	2011

Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	A Textbook of Fluid Mechanics and Hydraulic Machines 9th Revised Edition SI Units	R.K. Bansal	Laxmi Publications	9th	2009
2.	Introduction to Fluid Mechanics	Edward J. Shaughnessy Jr., Ira M. Katz, James P. Schaffer	Oxford University Press	1st	2005

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Course Details:

Class:	S.Y.B.Tech, Semester - IV
Course Code and Course Title:	0FTPC255 - Food Engineering-II Laboratory
Prerequisite/s:	--
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE / ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPC255_1	Carry out the calculations in mass transfer.
0FTPC255_2	Analyze the diffusion process
0FTPC255_3	Determine the absorption and adsorption in gaseus
0FTPC255_4	Design mass transfer equipments.
0FTPC255_5	Evalute the different extraction methods.
0FTPC255_6	Apply the knowledge to solve the mass transferd at the time of processing.

Course Contents:
Minimum 8 experiments from following list and one course project

Exp. No.	Title of Experiment
1	Design problem on mass balance equations.
2	Experiment on diffusion.
3	Determination of gas absorption.
4	Study of solvent extraction.
5	Study of Fixed-Bed Adsorption Columns.
6	Experiment on liquid-liquid mixing.
7	Study of solid-solid extraction
8	Stage Calculations in tray distillation.
9	Experiment on filtration.
10	Experiment on centrifugation.
11	Project-1:
12	Project-2:

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Transport Process and Unit Operations	Geankoplis C	PHI	4th	2009
2	Unit Operations	McCabe and Smith	McGraw-Hill	6th	2018

Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Introduction to food engineering	Singh and Heldman	Academic Press		

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Course Details:

Class:	S.Y.B.Tech, Semester – III
Course Code and Course Title:	0FTPC256 –Food chemistry Laboratory
Prerequisite/s:	--
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE / ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPC256_1	Identify moisture and protein contents
0FTPC256_2	Describe sorption isotherm
0FTPC256_3	Classify the total and reducing sugars
0FTPC256_4	Analyze the food additives
0FTPC256_5	Carry out the edible oil quality
0FTPC256_6	Explain the anti-nutritional factors present in foods

Course Contents:	
Exp. No	**Title of experiments**
1	Determination of moisture content by hot air oven method
2	Determination of protein content
3	Studies on sorption isotherm
4	To check effect of additives in food processing
5	Determination of total sugar in food
6	Estimation of reducing sugar in food
7	Determination of acid value of oil
8	Determination of iodine value of oil
9	Determination of saponification value
10	Studies of antinutritional factors of raw materials
11	Project 1: Determine the effect of Food Additives in bakery products
12	Project 2: Studies in Fried Foods

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Food Chemistry	H.-D. Belitz W. Grosch	Springer Science & Business Media	4th	2009
2	Principles of Food Chemistry	John M. Deman	Springer Science & Business Media	3rd	1999
3	Food Chemistry	S.A. Iqbal, Y Mido	Discovery Publishing House	1st	2011

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Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Introductory Food Chemistry.	John W. Brady Cornell	Comstock Publishing Associates Cornell University Press, Ithaca, USA.	1st	2013
2	Fennema's Food Chemistry	Srinivasan Damodaran, Kirk L. Parkin, & Owen R. Fennema	CRC.	4th	2009
3	Food Biochemistry and Food Processing	Benjamin K. S.	Wiley-Blackwell, London	2nd	2012

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Course details:

Class:	S.Y.B. Tech Semester IV
Course Code and Course Title:	0FTPC257 - Chemistry of Food Constituents Laboratory
Prerequisite/s:	--
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPC257_1	Examine the protein digestibility
0FTPC257_2	Carry out the determination of micro - nutrients
0FTPC257_3	Identify of tannins and phenol content from foods
0FTPC257_4	Examine the ascorbic acid
0FTPC257_5	Analyze the food colors
0FTPC257_6	Analyze the texture of foods

Exp. No.	Title of experiments
1	Determination of in-vitro digestibility of protein
2	Determination of phosphorus
3	Determination of iron
4	Determination of total carotenoids
5	Determination of ascorbic acid by dye method
6	Estimation of total phenol content
7	Estimation of calcium
8	Estimation of tannins from food
9	Determination of food colors
10	Determination of texture of different food groups
11	Project 1: - Development of Fortified Baby Foods
12	Project 2:- Effect of Food Colors on Dairy Products

Text Books :

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Food Chemistry	Owen R, Fennema	Marcel Dekker, Inc., New York, USA.	3rd	1996
2	Food Chemistry	Lillian Hoagland Meyer	Reinhold Publishing Corporation,	6th	1960
3	Analytical Method of Food Additives	Roger Wood, Lucy Foster, Andrew Damant, Pauline Key	CRC Press; Woodhead Pub	1st	2004

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Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Food Biochemistry and Food Processing	Benjamin K. S.	Wiley-Blackwell, London,	2nd	1983
2	Principles of Food Chemistry	DeMan JM	AVI Publishing Co Inc.,	3rd	1976
3	Food Chemistry	Meyer L.H.	CBS Publishers & Distributors, New Delhi (India)	2nd	2004

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Course details:

Class:	S.Y.B. Tech Semester IV
Course Code and Course Title:	0FTPR258 – Mini Project
Prerequisite/s:	--
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPR258_1	Apply knowledge of unit operations and process
0FTPR258_2	Carry out material and energy balance calculations of selected problem
0FTPR258_3	Design problem statement
0FTPR258_4	Use modern tools to solve problem
0FTPR258_5	Prepare a project report
0FTPR258_6	Present the solution of problem effectively

Sr. No.	**Guidelines/steps to complete Mini Project**
1	Identify the problem related to food process/ real life/ industry with the help of supervisor/guide
2	Design the problem statement by applying the knowledge of basic Food Technology/Engineering courses
3	Carry Out Literature Survey
4	Design the experiments/methodology
5	Carry out experimentation/simulation
6	Analyze the Results
7	Compare with standards available in literature
8	Prepare report

Text/Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	How to Write Dissertations & Project Reports	Dr Kathleen McMillan, D r Jonathan Weyers	Pearson Education Limited	--	2012
2	Dissertations and Project Reports: A Step by Step Guide	Stella Cottrell	Palgrave Macmillan	--	2014
3	Tips For Project Report Writing For Engineering All Streams	Virendra Dilip Thoke	FSP Media Publications	--	2018

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Course details:

Class:	S.Y.B. Tech Semester IV
Course Code and Course Title:	0FTPR259 – In-Plant Training
Prerequisite/s:	--
Teaching Scheme: Practical	--
Credits:	01
Evaluation Scheme: ESE	50

Course Outcomes: After completing this course students will be able to	
0FTPR259_1	Understand industry culture
0FTPR259_2	Work in team
0FTPR259_3	Understand industrial Management
0FTPR259_4	Apply concepts studied in actual industrial problem
0FTPR259_5	Prepare training report
0FTPR259_6	Apply various industrial aspects in real life

Guidelines for In-Plant training

Students are need to undergone in-plant training in food process industry for minimum period of 15 days. During the training, students should report to concern authorities from industry and faculty advisor assigned by department on regular basis.
After completion of training, students should collect training completion certificate and prepare report based on learning from in-plant training and submit to department for evaluation.
Oral examination/presentation will be conducted at the beginning of semester –V.

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ANNASAHEB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY, ASHTA
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Department of Food Technology

Course Details:

Class:	S.Y.B.Tech, Semester– V
Course Code and Course Title:	0FTPC351 - Nutrition laboratory
Prerequisite/s:	Food Chemistry Laboratory - 0FTPC256
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTES351_1	Carry out the analysis of proximate composition of all food products.
0FTES351_2	Develop the healthy food products
0FTES351_3	Examine the natural & added sugars from foods
0FTES351_4	Calculate the energy value by using calorimeter
0FTES351_5	Extract the pigments from vegetables
0FTES351_6	Design the healthy diet for various age groups

Course Contents:

Exp. No.	Title of Experiment
1	Determination of protein content from grains
2	Estimation of starch by Anthrone reagent method
3	Determination of crude fiber content from raw material
4	Estimation of vitamin A
5	Measurement of BMI
6	Measurement of calorific value using bomb calorimeter
7	Estimation of lycopene from vegetables
8	Estimation of ascorbic acid in fruit juices using dye method
9	Analysis of nutritional quality of food
10	Preparation of functional food
11	Project-1: Food products development for lactating women
12	Project-2: Preparation of iron and calcium rich staple food

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Text Books:					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Essentials of Human Nutrition.	Mann, Jim and Stewart Truswell	Oxford University Press,	2nd	2002
2	Introduction to Human Nutrition	Gibney, Michael J., et al	Blackwell	2nd	2009
3	Hand book of nutrition and science	Carolyn D. Berdanier, Jyohana Dwyer, Elaine B. Feldman	CRC press Taylor and francis group	2nd	2008

Reference Books:					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Food Science, Nutrition and Health	Fox, B. A. and Cameron, A.G	, Edward Arnold, London	5th	2005
2	Food Chemistry	SrinivasanDamodaran, Kirk L. Parkin, and O.R. Fennema, E	CRC Press, New York	4th	2007
3	Advanced Nutrition and Human Metabolism	Gropper, Sareen S. and Jack L.Smith	Wadsworth Publishing,	5th	2008

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TY FT-20/49

ANNASAHEB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY, ASHTA
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Course Details:

Class:	S.Y B.Tech, Semester - VI
Course Code and Course Title:	0FTPC352- Processing of Fruits and Vegetables Laboratory
Prerequisite/s:	Food Chemistry 0FTPC209, Principles of Food Preservations 0FTPC211
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE / ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPC352_1	Understand various processing of fruits and vegetables
0FTPC352_2	Use of different machineries and equipment for various unit operations
0FTPC352_3	Develop value added product
0FTPC352_4	Improve shelf life of products made from fruits and vegetables
0FTPC352_5	Improve nutritional quality of traditional products
0FTPC352_6	Recommend solution to agriculture related problem

Course Contents:
Minimum 8 experiments from following list and one course project

Exp. No.	Title of Experiment
1	Primary processing of selected fruits and vegetables
2	Estimation of adequacy of blanching
3	Canning of fruits and vegetables
4	Determination of TSS and viscosity of fruit jam
5	Determination of TSS of RTS beverage
6	To analyze quality of fruit squash
7	Determination of acidity of tomato ketchup
8	Determination of moisture content of fruit leather
9	To analyze sensory analysis banana/ potato wafers at different time-temperature combination
10	To analyze quality of dehydrated tomato powder
11	Project-1Dehydration of grapes
12	Project-2 To analyze quality of dehydrated powder of any vegetable

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Text Books:					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	Preservation of fruits and vegetables	GirdhariLal, G. S. Siddappa, G.L. Tandon	Indian Council of Agricultural Research	1st	1967
2.	Handbook of Analysis and Quality Control for Fruits and Vegetable Products	Ranganna S.	Tata-McGraw Hill	2nd	2001
3.	Fruit And Vegetable Preservation: Principles and Practices	R. P. Srivastava	International Book Distributing Company	3rd	2005

Reference Books:					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	Post-Harvest Physiology &Handling of Fruits and Vegetables	Hosahalli S. Ramaswamy	DEStech Publications, Inc.	1st	1996
2.	Handbook of Vegetable Science and Technology: Production, Composition, Storage & Processing	Salunke D. K. Kadam S. S.	Marcel Dekker Inc, New York	1st	1988
3.	Fruits & vegetables juice processing technology	Tressler D.K.& Joslyn M.A.	AVI publishing Co. Westport, Connecticut	1st	1961

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ANNASAHEB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY, ASHTA
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Course Details:

Class:	T.Y
Course Code and Course Title:	0FTPC353 Processing of Milk and Milk Products Laboratory
Prerequisite/s:	Food Chemistry 0FTPC209, Food Microbiology 0FTPC204
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE / ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPC353_CO1	Evaluate the basic composition and properties of milk.
0FTPC353_CO2	Design the primary processing of milk.
0FTPC353_CO3	Apply the milk processing equipment.
0FTPC353_CO4	Demonstrate the different types of dairy products.
0FTPC353_CO5	Prepare the fermented dairy products.
0FTPC353_CO6	Improve the shelf life of dairy products.

Course Contents: Minimum 8 experiments from following list and one course project	
Exp. No.	**Title of Experiment**
1	Sampling of milk and milk production.
2	Study of milk testing by methylene blue reduction test
3	Determination of fat content of milk.
4	Detection of adulterants in milks.
5	Determination of pH of butter
6	Study on sensory evaluation of ice-cream.
7	Determination of acidity of fermented milk products (Shrikhand)
8	Determination of moisture content of khoa
9	Study on ash content in channa based sweet (*Rasogulla*)
10	Determination of protein content in paneer.
11	Project-1: Waste utilization of milk whey
12	Project-2: Visit to Dairy plant.

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Text Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Outlines of Dairy Technology	Sukumar De.	OxfordUniversity Press	2nd	1994
2	Principles of Dairy Processing	JamesN.Warner	Wiley Eastern Ltd	3rd	1998
3	Dairy Technology: Principles of milk properties and processes	Walstra P.	CRC Press	1st	199

Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Dairy Processing	Garret Smit. G	Woodhead Publishing Limited, England	1st	2005
2	Judging of Dairy Products	J.A.Nelson and Trout	The Olsen publishing Co. Milwankee, Wisconsin, USA	3rd	1951

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ANNASAHEB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY, ASHTA
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Course Details:

Class:	T.Y.B.Tech Semester V
Course Code and Course Title:	0FTPC354 Food Additives & Ingredients Laboratory
Prerequisite/s:	Principles of Food Preservations - 0FTPC211 Food Microbiology- 0FTPC204
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes: After completion of this course students will be able to	
0FTPC354_1	Optimize the food additives for commercial use
0FTPC354_2	Examine the emulsifiers and stabilizers for food products
0FTPC354_3	Specify the leavening agents for bakery products.
0FTPC354_4	Implement the analytical techniques
0FTPC354_5	Extend the shelf life of fruit juices
0FTPC354_6	Qualitative detection of food products

Course Contents:	
Exp. No	**Title of Experiment**
1	Evaluation of GRAS aspect of food additives
2	Determination of diacetyl content in dairy products
3	Study of effect of acidulates in fruit juices
4	Study of effect of stabilizers/thickeners on quality of foods
5	Role of leaving agent in baked food product
6	Role and mode of action of antioxidant in food products
7	Determination of total chlorophyll by Spectrophotometric method
8	Identification of food colors by TLC
9	Qualitative Tests for presence of benzoic acid in foods
10	Study of effect of clarifying agents on the fruit juices
11	Project 1: Preparation of dairy products
12	Project 2: Preparation of value added fruit products

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Text Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Food science	Norman N. Potter and Joseph H. Hotchkiss	Springer Science New York	5th	1995
2	Food Additive	R. M. Pandey and S. K. Upadhyay	In Tech	1st	2012
3	Essential guide to food additives	Victoria Emerton and Eugenia Choi	Leatherhead Food International Ltd	3rd	2008

Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Food Science, Nutrition and Health	Fox, B. A. and Cameron, A.G	Edward Arnold, London	5th	2005
2	Food Chemistry	Srinivasan Damodaran, Kirk L. Parkin, and O.R. Fennema, E	CRC Press, New York	4th	2007
3	Methods of Analysis of Food Components and Additives	Semih Ötles	Taylor & Francis Group, LLC CRC Press	2nd	2012

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ANNASAHEB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY, ASHTA
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Course Details:

Class:	T.Y.B.Tech Semester VI
Course Code and Course Title:	0FTPC355 Processing of Cereals, Pulses & Oilseeds Laboratory
Prerequisite/s:	Unit Operations Laboratory- 0FTES251
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPC355_1	Distinguish the physicochemical properties of raw material.
0FTPC355_2	Analyze the wheat quality for preparation of cake, biscuit etc
0FTPC355_3	Characterize the quality of legumes and pulses
0FTPC355_4	Analyze the physicochemical properties of the oil
0FTPC355_5	Recognize the anti nutritional factors present in cereals, legumes and pulses
0FTPC355_6	Correlate the raw material and finish product quality

Course Contents:	
Exp. No	**Title of Experiment**
1	Physiochemical Properties of grains and flours
2	Determination of Gluten content
3	Preparation of Bread/cookies/cake
4	Determination of starch content of cereal
5	Puffing of legumes
6	Cooking quality of dhal
7	Anti-nutritional factors from legumes
8	Extraction of oil from oil seeds
9	Measurement of physico-chemical properties of oils
10	Preparation of peanut butter
11	Project 1: To check the quality parameters of bakery products
12	Project 2: Development of nutritional bar

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Text Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Technology of Cereals	Kent NL	Woodhead Publishing ISBN: 9780080408347	4th	1994
2	Bailey's industrial Oil and fat Products	Fereidoon Shahidi	Wiley- interscience	6th	2005
3	Principles of cereal science and technology	Hoseney R S	AACC	2nd	1994

Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Cereal and Cereal Products	Dendy Dav & Dobraszczyk BJ	Aspen Publication,	1st	2001
2	Cereal Science	Matz SA	AVI Publication,	1st	1971
3	Chemistry of Cereal Grains	Peter Koehler and Herbert Wieser	Springer Science & Business Media New York	6th	2013

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ANNASAHEB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY, ASHTA
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Course Details:

Class:	T.Y
Course Code and Course Title:	0FTPC356 Processing of Meat, Fish & Poultry laboratory.
Prerequisite/s:	Food Chemistry-0FTPC209, Food Microbiology-0FTPC204
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE / ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPC356_CO1	Evaluate the basic composition and chemistry of meat.
0FTPC356_CO2	Design the primary processing and pre-slaughtering of animals.
0FTPC356_CO3	Apply to Optimize Technology for processing of meat.
0FTPC356_CO4	Evaluate the meat tenderization.
0FTPC356_CO5	Demonstrate the quality of poultry products.
0FTPC356_CO6	Improve the preservation techniques of fish and marine products.

Course Contents: Minimum 8 experiments from following list and one course project	
Exp. No.	**Title of Experiment**
1	Slaughtering and dressing of poultry bird
2	Determination of water holding capacity of meat
3	Determination of meat pH
4	Determination of metmyoglobin content of meat
5	Determination of Microbial count of meat products
6	Determination of Tenderization of meat
7	Composition and structure of egg.
8	Determination of egg quality by Haugh unit
9	Preparation of Fish pickle.
10	Study of anatomy and dressing of fish
11	Project-1: Quality evaluation of dried fish.
12	Project-2: Quantitative analysis of fat content in meat.

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Text Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Meat Science and Applications	Hui, Y.H., Nip, W.K., Rogers, R.W,	Marcel Dekkar Inc. New York	1st	2001
2	Handbook of Poultry Science and Technology	Legarreta,I.G.	John Wiley & Sons, Inc., Hoboken	1 and 2	2010
3	Processed Meat	Pearson, A.M. & Gillett, T.A	Chapman & Hall,	3rd	2006.

Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	Meat Processing	Joseph Kerry, John Kerry and David Ledwood,	Woodhead Publishing Limited, CRC Press,	1st	2002
2	Post Harvest Technology of Fish and Fish Products	Balachandran, K.K,	", Daya Publishing House, New Delhi	1st	2001

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ANNASAHEB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY, ASHTA
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Course Details:

Class:	S.Y B.Tech. Semester - VI
Course Code and Course Title:	0FTPC357- Bakery and Confectionary Laboratory
Prerequisite/s:	Food Chemistry 0FTPC209, Food Microbiology 0FTPC204, Chemistry of Food Constituents 0FTPC210
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE / ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPC357_1	Use equipment in bakery and confectionery industry
0FTPC357_2	Understand processing parameters
0FTPC357_3	Develop production flow sheet of different products
0FTPC357_4	Demonstrate analytical parameters of products
0FTPC357_5	Understand function of various ingredients
0FTPC357_6	Improve packaging of the products

Course Contents:
Minimum 8 experiments from following list and one course project

Exp. No.	Title of Experiment
1	Determination of gluten content of wheat
2	Determination of falling number
3	Determination of dough rising capacity
4	To determine fat percentage and moisture contentof biscuit
5	To analyzecarbohydrate percentage and sensory parametersof sponge cake
6	Determination of protein content of bread
7	Determination total sugar content of high boiled sweets
8	Rheological Testing (farinograph, mixograph, extensiograph, alveograph, amylograph)
9	Production of invert sugar
10	Determination of moisture content of toffee
11	Project-1: Making of bread by using rice flour
12	Project-2: To analyze quality of lozenge

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Text Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1.	Bakery Products Science and Technology	Weibiao Zhou, Y. H. Hui	Wiley-Blackwell	2nd	2014
2.	Sugar Confectionery and Chocolate Manufacture	R. Lees and E.B. Jackson	Springer	1st	1995
3.	Dough Rheology and Baked Product Texture	Juan A. Menjivar Hamed Faridi Ph.D., Jon M. Faubion	Springer	1st	1990

Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1.	Baked Products: Science, Technology and Practice	Stanley P. Cauvain, Linda S. Young	Wiley-Blackwell	1st	2006
2.	Chocolate, Cocoa and Confectionery: Science and Technology	Bernard W. Minifie	Springer	1st	1989
3.	Industrial Chocolate Manufacture and Use	S. T. Beckett	John Wiley & Sons Inc.	5th	2017

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ANNASAHEB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY, ASHTA
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Course Details:

Class	T.Y.B.Tech Semester VI
Course Code and Course Title	0FTPR361 – Minor Project
Prerequisite/s	Mini Project 0FTPR258, Food Engg-I, II-0FTPC205 & 0FTPC208, Unit Operations-0FTES203, Process Calculations 0FTES201, Engg. Thermodynamics 0FTES202
Teaching Scheme: Practical	02
Credits:	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPR258_1	Apply knowledge of food engineering
0FTPR258_2	Carry out material and energy balance calculations of selected problem
0FTPR258_3	Design problem statement
0FTPR258_4	Use modern tools to solve problem
0FTPR258_5	Prepare a project report
0FTPR258_6	Present the solution of problem effectively

Sr. No.	**Guidelines/steps to complete Mini Project**
1	Identify the problem related to food process industry with the help of supervisor/guide
2	Design the problem statement by applying the knowledge of basic Food Technology/Engineering courses
3	Carry Out Literature Survey
4	Design the experiments/methodology
5	Carry out experimentation/simulation
6	Analyze the Results
7	Compare with standards available in literature
8	Prepare report

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Text/Reference Books:					
Sr. No.	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
1	How to Write Dissertations & Project Reports	Dr Kathleen McMillan, Dr Jonathan Weyers	Pearson Education Limited	--	2012
2	Dissertations and Project Reports: A Step by Step Guide	Stella Cottrell	Palgrave Macmillan	--	2014
3	Tips For Project Report Writing For Engineering All Streams	Virendra Dilip Thoke	FSP Media Publications	--	2018

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Course Details:

Class	T.Y.B.Tech Semester VI
Course Code and Course Title	0FTPR362 – In-plant Training
Prerequisite/s	Mini Project 0FTPR208, Food Engg-I, II-0FTPC205 & 0FTPC208 Unit Operations-0FTES203, Process Calculations 0FTES201, Engg. Thermodynamics 0FTES202
Teaching Scheme: Practical	--
Credits:	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes: After completing this course students will be able to	
0FTPR259_1	Understand industry culture and processes
0FTPR259_2	Work in team
0FTPR259_3	Understand industrial Management
0FTPR259_4	Apply concepts studied in actual industrial problem
0FTPR259_5	Prepare training report
0FTPR259_6	Apply various industrial aspects in real life

Guidelines for In-Plant training
Students should undergone in-plant training in food process industry for minimum period of 30 days. During the training, students should report to concern authorities from industry and faculty advisor assigned by department on regular basis. After completion of training, students should collect training completion certificate and prepare report based on learning from in-plant training and submit to department for evaluation. Oral examination/presentation will be conducted at the beginning of semester –VII.

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Course Details:

Class	S. Y. B. Tech. Sem-III
Course Code and Course Title	**1MEMC207, Environmental Studies**
Prerequisite/s	--
Teaching Scheme: Lecture	02
Credits	--
Evaluation Scheme: ISE	50 (Grade)

Course Objectives	
01	To discuss the importance of environmental elements
02	To explain characteristics of environmental pollutants and their impacts.
03	To promote practices for achieving better environmental conditions
04	To summarize the methods and laws relevant for environmental management,

Course Outcomes (COs) Upon successful completion of the course students will be able to:	
1MEMC207_1	**Explain** importance of environmental studies with necessary of acts.**(K^2)**
1MEMC207_2	**Explain** importance of public awareness on environmental problems **(K^2)**
1MEMC207_3	**Write** a technical report in team regarding course and impacts of environment related issues.**(S^2)**
1MEMC207_4	**Discuss** current concern of environment issues.**(A^2)**
1MEMC207_5	**Describe** the need of environment protection and ethics.**(A^2)**

Course Contents:		
Unit 1	**Nature of Environmental Studies** Definition, scope and importance. Multidisciplinary nature of environmental studies, Need for public awareness.	**02Hrs**
Unit 2	**Natural Resources and Associated Problems** a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people; b) Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy, f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.	**04Hrs**
Unit 3	**Ecosystems** 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, characteristics features, structure and function of the following ecosystem :- a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem d)Aquatic ecosystems	**04Hrs**

	(ponds, streams, lakes, rivers, oceans, estuaries)	
Unit 4	**Biodiversity and its conservation** Introduction- Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega- diversity nation. Western Ghat as a biodiversity region. Hot-spots of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man- wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**05Hrs**
Unit 5	**Environmental Pollution** Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.	**04Hrs**
Unit 6	**Social Issues and the Environment** Disaster management: floods, earthquake, cyclone, tsunami and landslides Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products.	**03Hrs**
Unit 7	**Environmental Protection** From Unsustainable to Sustainable development Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights	**06Hrs**

Mini project based on: (Mini Project report is Mandatory.)
Environmental assets River/Forest/Grassland/Hill/Mountain.

OR

A local polluted site Urban/Rural/Industrial/Agricultural.

OR

Study of common plants, insects, and birds.

OR

Study of simple ecosystems - ponds, river, hill slopes, etc.

Assessment Method:

1. Mini Project report – 05 marks
2. Seminar – 05 marks
3. ISE question paper format will be Multiple Choice Questions- 40 Marks

Unit No.	Topic Name	Weightage
1	Nature of Environmental Studies.	4 Marks
2	Natural Resources.	7 Marks
3	Ecosystems	7 Marks
4	Biodiversity and its conservation	7 Marks
5	Environmental Pollution	7 Marks
6	Social Issues and the Environment	8 Marks

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S4-ME-17150

IMPORTANT NOTES:

1. ISE will be conducted in 14th week of Sem.
2. Mini Project report will be submitted to course coordinator in 10th week of Sem.
3. Students should get minimum 40% marks to get PP (PASS) grade.
4. Students getting less than 40% marks will be offered NP (NOT PASS) grade.
5. To get B. Tech. Degree PP grade in Environmental Studies is mandatory.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Environmental Studies	Dr. B. S. Chauhan	University Science Press, New Delhi	First	2008
2	Environmental Studies	Dr. P. D. Raut	S. U. Kolhapur	Third	2011

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Principals of Environmental Science and Engineering	Raman Sivakumar	Cengage learning Singapore	Second	2005
02	Elements of Environmental Science and Engineering	P. Meenakshi	Prentice Hall of India Private Limited, New Delhi	-	2006
03	Environmental Science – working with the Earth	G.Tyler Miller Jr	Thomson Brooks /Cole	Eleventh	2006

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S4 - ME - 18150

Course Details:

Class	S. Y. B. Tech. Sem-III
Course Code and Course Title	**1MEHS254, General Proficiency Laboratory**
Prerequisite/s	1MEHS111
Teaching Scheme: Practical	02
Credits	01
Evaluation Scheme: ISE / ESE	**25/00**

Course Objectives: The course aims:	
01	To improve students' performance in formal communicative events.
02	To review students' competence of written communication and enrich it
03	To enhance students' team spirit and enable them to work in a team.
04	To nurture students' soft skills

Course Outcomes (COs):
Upon successful completion of this course, the student will be able to:

1MEHS254_1	**Acquaint** etiquettes of formal communicative event and perform better in formal communicative events. **($A^2 S^3$)**
1MEHS254_2	**Collect** relevant information and utilize it effectively, in formal communicative events. **($A^2 S^3$)**
1MEHS254_3	**Construct** meaningful and logically interwoven extracts necessary for professional correspondence like email professional letters. **(A^3S^3)**
1MEHS254_4	**Write** relevant professional e-mails and letters. **(A^3S^3)**
1MEHS254_5	**Adapt** in team and will contribute positively to strengthen team performance. **(A^2S^3)**

Course Contents:

1. Presenting technical topic -Tech-talk
2. Putting an argument - Debate
3. Group Discussion (General)
4. Composing professional e-mail
5. Application Letter and Resume Writing
6. Placing an Order
7. Group Discussion (Technical)
8. Performing a professional situation
9. Making a Power point presentation
10. Mock Interview

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	The Fundamental	Prajapati	S.K. Katariya and Sons	Fifth	2012

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S4-ME-25150

	Aspects of Communication Skills	Prasad	Publisher of Engineering and Computer Books.		
02	Effective Technical Communication	Ashraf Rizvi	Tata McGraw Hills	Fifth	2018
03	Group Discussion: A Practical Guide to Participation and Leadership	Julia T. Wood, Gerald M. Phillips	Waveland Press	Fourth	2007

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	High-school English Grammar and Composition	Wren and Martin	S. Chand and Co., New Delhi	First	2011
02	The Ace of Soft Skills	Gopalswami Ramesh, Mahadevan Ramesh.	Pearson Publication, Delhi.	Second	2011
03	Business Communication	P. Shubha Rao, B. Anita Kumar, C. Hima Bindu	Cengage Learning India, Pvt. Ltd. 418 FIE Pratapganj, Delhi, 110090	Third	2017
04	Business Correspondence and Report Writing	R. C. Sharma, Krishna Mohan	Tata McGraw Hills	Fifth	2016

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SY-ME-26150

Course Details:

Class	S. Y. B. Tech. Sem-IV
Course Code and Course Title	**1MEHS213, Economics for Mechanical Engineers**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	03/00
Credits	00
Evaluation Scheme: ISE I/ MSE/ ISE II/ ESE	10/30/10/50

Course Objectives: The course aims:	
01	To explain different financial concepts in economics.
02	To explain elements of costs related to production.
03	To compare and Select Application of different Investment analysis methods

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1MEHS213_1	**Explain** concept of microeconomics and macroeconomics. **(K^2)**
1MEHS213_2	**Describe** forecasting tools of demand and supply management. **(K^2)**
1MEHS213_3	**Explain** different monetary policy tools.**(K^2)**
1MEHS213_4	**Explicate** elements of costs related to production.**(K^2)**
1MEHS213_5	**Illustrate** basic concept of budget and its analysis. **(K^3)**

Course Contents:		
Unit-I	**Introduction to Economics:** Role of Engineer as an Economist, Types and problem of economies, Basics of economics, Flow in an economy, Concept of Engineering Economics, Engineering efficiency, Economic efficiency, Scope of engineering economics, Nature of Company.	**05 Hrs.**
Unit-II	**Basic Concepts of Microeconomics and Macroeconomics:** Law of supply and demand, Concept of Demand & Elasticity of Demand. Concept of Supply & Elasticity of Supply, Supply, Demand, and Equilibrium, Elasticity and Its Applications, GDP, Unemployment and Labor Force Participation, Components of Monetary and Financial System, Central Bank, Commercial Banks, Monetary and Fiscal Policy Tools, Taxes.	**10 Hrs.**
Unit-III	**Cost of Production:** Element of costs, accounting cost, sunk cost, marginal cost and opportunity cost. Break even analysis, Cost estimation, Material Costs, Direct Labor Costs, Fixed Over-Heads, Factory cost, Administrative Over-Heads, Transportation Costs, Repair and Maintenance.	**07 Hrs.**
Unit-IV	**Value Engineering**	**09 Hrs.**

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	Make or buy decision, Value engineering, Function, Aims, Value engineering procedure. Interest formulae and their applications, Time value of Money, PAT, PBT, Financial sources available of Firms.	
Unit-V	**Capital Budgeting:** Budgets, Capital Budgeting, Investment Analysis-Net Present Value, Return on Investment, Internal Rate of Return, Payback Period, Financial Statement analysis, Balance sheet.	**07 Hrs.**
Unit-VI	**Depreciation and Financial Accounting** Introduction, Depreciation and Depreciation Accounting, Reasons for Depreciation, Value of an Asset, Straight Line Depreciation, Declining Balance Depreciation, Elements of Financial Accounting, Measuring the Performance of a Firm, Asset to Liability Ratio.	**06Hrs.**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Fundamentals of Engineering Economics	Pravin Kumar	Wiley Precise Text book Series	First	2015
02	Principles of Economics	Mankiw Gregory	Thompson Asia	First	2002
03	Managerial Economics	V. Mote, S. Paul, G. Gupta	Tata McGraw Hill	Third	2004
04	Textbook of Business Economics	Pareek Saroj	Sunrise Publishers	Second	2003

Other Books/E-material

Sr. No	Title	Publisher
1	Moneycontrol.com	CNBC

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SY-ME-40150

Course Details:

Class	T. Y. B. Tech. Semester-VI
Course Code and Course Title	**1MEPR362, Mini Project**
Prerequisite/s	All Courses
Teaching Scheme: Practical	02
Credits	01
Evaluation Scheme: ISE	25

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1MEPR362_1	**Identify** the real life institutional, societal, industrial problems/issues for sustainable development.
1MEPR362_2	**Design**, development and testing of components, systems and or processes using modern tools/ techniques and available resources using contemporary knowledge.
1MEPR362_3	**Analyze** the results obtained from analytical and or numerical and or experimental methods.
1MEPR362_4	**Function** effectively as an individual or as a team for understanding of the engineering and management principles and apply these to manage the projects by maintaining professional and ethical values.
1MEPR362_5	**Communicate** effectively on complex engineering activities, write appropriate project report and make effective presentations.
1MEPR362_6	**Engage** in life-long learning in the broadest context of technological change.

COs correlated with Psychomotor and Affective domains will be assessed at the end of semester through various rubrics based on student's performance throughout the semester.

Course Contents:

- Project work can be a design project / experimental project and or computer simulation project on mechanical engineering or any of the topics related with mechanical engineering stream.
- Project work may consist of fabrication and experimental work or exhaustive analysis of system in the context of 2-3 factors identified while formulating problem by them or supported by industry.
- Project work consists of two reviews based on work. In the first review, progress of the project work done is to be assessed and in second review, the complete assessment (quality, quantum and authenticity) of the thesis is to be evaluated.
- Each group has to present the work carried out and analysis results obtained in final project evaluation.
- Students have to prepare final project report under the guidance of the project guide. Project report should consist of assembly and details drawing of product/setup/prototype

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prepared by using CAD software. It should also include bill of material, all geometrical dimensions, limit, fit and tolerances.

- Along with the Mini Project, students should attend hands on training/internship/ certification courses in their area of interest.
- One copy of the report is expected to be submitted to project guide and one copy should remain with project group.

Project work submitted by students shall include;

1. *Work Diary*: Work Diary maintained by group and countersigned by the guide weekly. The contents of work diary shall reflect the efforts taken by project group for

a. Searching suitable project work
b. Brief report preferably on journals/ research or conference papers/ books or literature surveyed to select and bring up the project.
c. Day to day activities carried out related to project work for entire semester.

2. *Synopsis*: The group should submit the synopsis in following prescribed format.

a. Title of Project
b. Names of Students
c. Name of Guide
d. Relevance
e. Present Theory and Practices
f. Proposed work
g. Expenditure
h. References

The synopsis should consist of minimum **eight** review papers. The synopsis shall be signed by each student in the group, approved by the guide and endorsed by the Head of the Department.

3. ***Presentation & report*:** The group has to make a presentation in front of the faculty members and review panel member at the time of Review's.

Project-I Report Format:

Project report should be of 25 to 30 pages (typed on A4 size sheets). For standardization of the project reports the following format should be strictly followed.

1. Page Size: Trimmed A4
2. Top Margin: 1.00 Inch
3. Bottom Margin: 1.32 Inches
4. Left Margin: 1.5 Inches
5. Right Margin: 1.0 Inch
6. Para Text: Times New Roman 12 Point Font
7. Line Spacing: 1.5 Lines
8. Page Numbers: Right Aligned at Footer. Font 12 Point. Times New Roman
9. Headings: Times New Roman, 14 Point , Bold Face

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10. References: References should have the following format
For Papers: Authors, "Title of Paper", " Journal/Conference Details", Year
For Books: Authors, "Title of Book", Publisher, Edition

Important Notes:

- Along with Mini Project students are informed to do Hands on Training/Internship/ / Certification Courses.
- Project group should continue maintaining a work diary for project and should write (a) Book referred (b) Company visited (c) Person contacted (d) Paper referred (e) Creative thinking.
- Students should prefer to attend hands on training/internship in reputed/well known industries or certification courses floated or organized by reputed institutions as per guidelines given by department.
- Number of students in one batch will be as per guidelines given by department.

Assessment Tools: Project Synopsis Assessment Rubric, Project Assessment Rubric

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Course Details:

Class	B. Tech. Sem,-VII
Course Code and Course Title	**1MEPR455, Project Phase-I**
Prerequisite/s	All Courses
Teaching Scheme: Practical	10
Credits	05
Evaluation Scheme: ISE / ESE	50/50

Course Objectives: The course aims:	
01	To offer students a glimpse into real world problems and challenges that need a technology based solutions.
02	To develop the proficiency in the students for the problem formulation.
03	To prepare the students for effective completion of the project with the observations, discussions, decision making process & use of software's.
04	To develop the team building, communication and management skills of the students.

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1MEPR455_1	**Identify** the real life practical problem relevant to the industry, societal, health & environmental issues for sustainable development.
1MEPR455_2	**Formulate** a practical problem in real life to explore for its possible solution after suitable review of literature.
1MEPR455_3	**Analyze** the feasibility of different mechanisms/techniques/process.
1MEPR455_4	**Analyze** the problem and give suitable cost-effective optimal solution on the basis of engineering knowledge.
1MEPR455_5	**Design** of components, system or process that meet the specified needs by using advance tools/ techniques/ resources.

Course contents:

- Project-I work can be a design project / experimental project and or computer simulation project on mechanical engineering or any of the topics related with mechanical engineering stream.
- Project-I can be consists of problem identification, literature review, formulation of problem, design of components/system/ process, modern tools used in the project.
- Submission of synopsis of selected project work. Synopsis report should highlight scope, objectives, methodology, approach and tools to be used like software, other expected results and outcomes along with timeframe.
- One copy of the synopsis report should be expected to submit to project guide and one copy should remain with project group.
- Project -I work is to be extended for Project -II at B. Tech. (Mech.) Semester-VIII with same group working under guidance of same project guide assigned for Project-I.

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Project work submitted by students shall include;

- The report of the work completed in the form of project work diary, Project-I report and other relevant documents shall be submitted for the term work. The term work shall be assessed by the project guide and the assessment shall be based on a presentation of the work completed and submission of report.
  - ***Work Diary*:** Work Diary maintained by group & countersigned by guide weekly. The contents of work diary shall reflect the efforts taken by project group for
    - Searching suitable project work
    - Brief report preferably on journals/ research or conference papers/ books or literature surveyed to select and bring up the project.
    - Day to day activities carried out related to project work for entire semester.
  - ***Synopsis report*:** The group should submit the synopsis in following prescribed format.
    - Title of Project
    - Names of Students
    - Name of Guide
    - Relevance
    - Literature review
    - Proposed work
    - Methodology
    - Expected outcomes
    - Plan of proposed work
    - Detailed Budget Estimate
    - References

  *Synopsis should consist of minimum **eight** review papers and shall be signed by the each student in the group, approved by the guide and endorsed by the Head of the Department.*
  - ***Project-I report*:** Project-I report should be of 25 to 30 pages (typed on A4 size sheets). For standardization of the project-I reports the following format should be strictly followed.
    - Page Size: Trimmed A4
    - Top Margin: 1.00 Inch
    - Bottom Margin: 1.32 Inches
    - Left Margin: 1.5 Inches
    - Right Margin: 1.0 Inch
    - Para Text: Times New Roman 12 Point . Font
    - Line Spacing: 1.5 Lines
    - Page Numbers: Right Aligned at Footer. Font 12 Point. Times New Roman
    - Headings: Times New Roman, 14 Point , Bold Face
    - References: References should have the following format

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- For Papers: *Authors, "Title of Paper", Publisher Details, Volume, Year, Page no*
- For Books: *Authors, "Title of Book", Publisher, Edition, page nos.*

➢ ***Presentation of work completed*:** The student has to make a presentation in front of the faculty members and review panel member at the time of review's and submit presentation soft copy to project guide.

- Project work consists of two presentation reviews based on work i.e. first review: Synopsis is to be assessed and second review: project work progress assessment is to be evaluated.

Important Notes:

- Project group should continue maintaining a work diary for project and should write (a) Book referred (b) Company visited (c) Person contacted (d) Paper referred (e) Creative thinking.
- Work diary along with Project -I report shall be assessed at the time of ESE examination

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Course Details:

Class	B. Tech, Sem.-VIII
Course Code and Title	**1MEHS409, Project and Finance Management**
Prerequisite/s	1MEHS213,
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I/MSE/ISE II/ESE	00/50/00/50

Course Objectives: The course aims:	
01	To elaborate fundamental principles of management and business.
02	To discuss principles, polices of material and financial management.
03	To acquire knowledge about purchasing cycle, purchase policies & procedures to evaluate the purchase performance.

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1MEHS409_1	**Explain** the functions of management in organizations.
1MEHS409_2	**Categorize** different responsibilities, principles and polices of financial management and material management.
1MEHS409_3	**Make use of** purchasing cycle, purchase policies & procedures to evaluate the purchase performance.
1MEHS409_4	**Classify** financial sources for business management.
1MEHS409_5	**Prepare** project management plan for the given problem.

Course Contents:		
Unit 1	**Business Environment** Environmental factors influencing business, external environment, General environment, Task environment, business ethics and social responsibility of business, Effect of Globalization.	**08 Hrs**
Unit 2	**Functions of Management** - Definition of Management, Management environment. Planning – Need, Objectives, Strategy, Policies, Procedures, steps in Planning, Organizing – Process of Organizing importance and principle of organizing, Departmentation, Organizational relationship, Authority, Responsibility, Delegation, Span of control. Staffing – Nature, Purpose, Scope, Human resource management, Policies, Recruitment procedure training and development, Appraisal methods. Controlling – Process, requirement for control Management	**07 Hrs.**
Unit 3	**Materials Management-** Definition, Scope, functions, Materials requirements planning, purchasing objectives, 5-R Principles of Purchasing, Functions of Purchase department, Purchasing cycle, Purchase policy & procedure, Evaluation of Purchase Performance. Vendor selection, vendor rating, Make or buy decisions, Inventory Control - ABC Analysis, EOQ, and Inventory cost relationships.	**06 Hrs.**

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Unit 4	**Fundamentals of Manufacturing and Engineering**: The Effects of Manufacturing on Nation. The Elements of Manufacturing Competitiveness. The Impact of Engineering on Manufacturing, Design for Productivity, Design to Cost, Design with Technology, Design for Quality.	**07 Hrs.**
Unit 5	**Financial Management:** Types of Capital, Source of finance, Capital building, Institutions of Industrial finance, cash flow, balance sheet. Wage Administration: Definition of Salary, different wage schemes, Advantages and disadvantages, Incentive, need, types, its merits and demerits.	**07 Hrs.**
Unit 6	**Principles of Project Management:** Time and Schedule Management, Project Duration Diagnostics, Schedule Compression Techniques, Resource Analysis and Management, Techniques for Project Forecasting, Project Risk Analysis, Project Economic Analysis.	**07Hrs.**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Industrial Organization and business management	M.T. Telsang	S. Chand & Co.	Fifth	2011
02	Industrial Engineering and Production Management	M.T. Telsang	S. Chand & Co.	Twelve	2013
03	Industrial Management & Operation Research	Nandkumar Huukkeri	Electrotech publication	Second	2010
04	Management	James A.F. Stoner, R. Edward Freeman	Prentice Hall of India New Delhi	Seventh	2010

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Industrial Engineering and Management	O.P. Khanna	S. Dhanpatrai and Company	Seventh	2011
02	Management Information Systems	G.B. Davis, M.H. Olson	Mc Graw Hill	First	1985
03	Managerial Economics	V.Mote, S. Paul, G. Gupta	Tata McGraw Hill	Third	2003
04	Business Economics	Pareek Saroj	Sunrise Publishers	Second	2004

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(An Autonomous Institute)
Department of Mechanical Engineering

Course Details:

Class	B. Tech, Sem.-VIII
Course Code and Course Title	**1MEMC411, Constitution of India**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	02/00
Credits	--
Evaluation Scheme: ISE	**Audit**

Course Objectives (COs):- The course aims to,	
1	To acquaint the students with legacies of constitutional development in India.
2	To make students aware of the theoretical and functional aspects of the Indian Parliamentary System.
3	To channelize students' thinking towards basic understanding of Government of the Union and Government of the States.
4	To channelize students' thinking towards basic understanding of the Judiciary. Regulation to Information acts.

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1MEMC411_1	**Explore** the basic features and modalities about Indian constitution.
1MEMC411_2	**Differentiate** the functioning of Indian parliamentary system at the center and state level.
1MEMC411_3	**Describe** different aspects of Indian Legal System and its related bodies.
1MEMC411_4	**Discuss** different laws and regulations related to engineering practices.
1MEMC411_5	**Correlate** role of engineers with different organizations and governance models.

Course Contents:		
Unit 1	**Constitution:-** Structure and Principles Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947, Enforcement of the Constitution Meaning and importance of Constitution Making of Indian Constitution – Sources Salient features of Indian Constitution. Preamble.	**04 Hrs**
Unit 2	**Fundamental Rights and Directive Principles:-** **Fundamental Rights:** Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, Right to Constitutional Remedies.	**04 Hrs**

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	Fundamental Duties: Directive Principles-Definition, State to secure a social order for the promotion of welfare of the people, Certain principles of policy to be followed by the State, Equal justice and free legal aid, Right to work, to education and to public assistance in certain cases ,Provision for just and humane conditions of work and maternity Living wage, etc., for workers, Participation of workers in management of industries etc.	
Unit 3	**Union Executive and State Executive** Powers of Indian Parliament Functions of Rajyasabha, Functions of Loksabha, Powers and Functions of the President, Powers and Functions of the Prime Minister, Lokpal, Lokayukta. State Executives-Powers and Functions of the Governor, Powers and Functions of the Chief Minister, Functions of State Cabinet, Functions of State Legislature.	**06 Hrs**
Unit 4	**The Judiciary:** Features of judicial system in India Supreme Court –Establishment and constitution of Supreme Court Salaries, etc., of Judges Appointment of acting Chief Justice Appointment of ad hoc judges Attendance of retired Judges at sittings of the Supreme Court Supreme Court to be a court of record Seat of Supreme Court Original jurisdiction of the Supreme Court ,High Court – Structure and jurisdiction, Attorney general of India.	**06 Hrs**
Unit 5	**Regulation to Information:** Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act The Limited Liability Partnership Act, 2008. Companies Act 2013.The Central Goods and Services Tax **Act**, 2017	**04 Hrs**
Unit 6	**Business Organizations and E-Governance** Sole Traders, Partnerships Companies: The Company's Act: Introduction, Formation of a Company, Memorandum of Association, Articles of Association, Prospectus, Shares, Directors, General Meetings and Proceedings, Auditor, Winding up. E-Governance and role of engineers in E-Governance, Need for reformed engineering serving at the Union and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in a few states creating hurdles in Industrial development.	**04 Hrs**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	The Constitution of India	Dr. B. R. Ambedkar	Law literature Publications	---	2020
02	Introduction to the Constitution of India	Durga Das Basu	Gurgaon; LexisNexis	23rd	2018
03	Governance in India	M. Laxmikanth	Mc Graw Hill Publications Delhi	3rd	2021
04	The Constitution of India	P.M. Bakshi	LexisNexis	---	2019

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Reference Books:					
Sr. No	**Title**	**Author**	**Publisher**	**Edition**	**Year of Edition**
01	Introduction to the Constitution of India	Durga Das Basu	Gurgaon; LexisNexis	23rd	2018
02	The Constitutional Law of India,	. J.N. Pandey	Allahabad; Central Law Agency	55th	2018
03	. Constitution of India (Full Text)	India.gov.in	National Portal of India	---	---
04	India's Constitution	M.V.Pylee	S. Chand Publications New Delhi	16th	2017

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Course Details:

Class	S.Y. B. Tech, Sem.-IV
Course Code and Course Title	0AEHS211, Environmental Studies
Prerequisite/s	--
Teaching Scheme: Lecture	02
Credits	--
Evaluation Scheme: ISE	50 (Grade)

Course Objectives:	
01	To study the importance and scope of environmental studies.
02	To discuss the importance of public awareness on environmental problems.
03	To study about natural resources and biodiversity.
04	To discuss scientific, technological and economic solutions to environmental problems.
05	To study the pollution control and waste management

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
0AEHS211_1	Know importance and scope of environmental studies. (K^2)
0AEHS211_2	Explain the importance of public awareness on environmental problems. (K^2)
0AEHS211_3	Explain about natural resources and biodiversity. (K^2)
0AEHS211_4	Describe scientific, technological and economic solutions to environmental problems. (K^3)
0AEHS211_5	Explain the pollution control and waste management. (K^3)

Course Contents:

Unit 1	**Nature of Environmental Studies:** Definition, scope and importance. Multidisciplinary nature of environmental studies Need for public awareness.	**02 Hrs**
Unit 2	**Natural Resources:** Water resources, Mineral resources, Forest resources, Food resources, Land resources, Energy resources – Different types of energy, Conventional sources & Non-Conventional sources of energy Solar energy, Hydro electric energy, Wind Energy, Nuclear energy, Fossil Fuels, Hydrogen as an alternative energy.	**05 Hrs**
Unit 3	**Ecosystems:** Definition, Scope and Importance ecosystem. Classification, Structure and function of an ecosystem Food chains, food webs and ecological	**05 Hrs**

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	pyramids. Energy flow in the ecosystem, Bio-magnification, Bioaccumulation, ecosystem value.	
Unit 4	**Biodiversity and its conservation:** Introduction - Definition: genetic, species and ecosystem diversity. Bio-geographical 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, man wildlife conflicts; Conservation of biodiversity- In-situ and Ex-situ conservation. National biodiversity act.	**05 Hrs**
Unit 5	**Environmental Pollution:** Water Pollution, Noise pollution, Land Pollution, Public Health Aspects, Global Environmental Issues: Population Growth, Urbanization, Land Management, Water & Waste Water Management. Air Pollution: Effects – Global Warming, Acid rain & Ozone layer depletion, controlling measures.	**05 Hrs**
Unit 6	**Social Issues and the Environment:** Disaster Management and Urban Problems, role of non-governmental organization, water conservation, rain water harvesting, Waste management and watershed management. Environmental ethics: Issues and possible solutions, Environmental Legislation and Acts.	**06 Hrs**

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. **(Hand written field work Report is mandatory.)**	**08 Hrs**

Assessment Method:

1. Individual field work report – 10 marks
2. Question paper format will be Multiple Choice Questions- 40 Marks

Unit No.	Topic Name	Weightage
1	Nature of Environmental Studies.	4 Marks
2	Natural Resources.	7 Marks
3	Ecosystems	7 Marks
4	Biodiversity and its conservation	7 Marks
5	Environmental Pollution	7 Marks
6	Social Issues and the Environment	8 Marks

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Course Details:

Class	T.Y. B. Tech, Sem.-VI
Course Code and Course Title	0AEHS308, Economics&Management
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISEI/MSE/ISEII/ESE	10/30/10/50

Course Objectives: The course aims to	
1	Ignite the entrepreneurial spirit or inculcate culture ofentrepreneurship among the students
2	Enable the students to study the evolution of Management, to study the functions and principles of management and to learn the application of the principles in an organization

Course Outcomes (COs): Upon successful completion of this course, the student will be able to	
0AEPC308_1	Describe the role of economics involved in the decision making process (K^2)
0AEPC308_2	Calculate the rate of return, depreciation charges and taxes. (K^3)
0AEPC308_3	Enumerate different cost entities in estimation, and Explain the importance of finance functions. (K^2)
0AEPC308_4	Describe the significance of Marketing Management and Product Management in the success of an organization. (K^2)

Course Contents:

Unit 1 : Managerial Economics
The Economic Way of Thinking-Demand Analysis 1-Demand Analysis II & Estimation-Production & Costs I-Production & Costs: II-Profit-Maximization & Competitive Markets- Price-Searchers, Cartels, Oligopoly-Advanced Pricing and Auctions-Game Theory and Asymmetric InformationTypes of Business organization - Sole proprietorship, partnership, company-public and private sector enterprises - Organization culture and Environment – Current trends and issues in Management.
(06 Hours)
Unit 2 : Indian Economy and Policy
Introduction to the course-Colonialism and development of the Indianeconomy-De-industrialization of Indian economy-Business enterprises-Growth and economic reforms-Poverty and Inequality-Macroeconomic overview and Fiscal and Monetary Policy-Financial sectorperformance and impending reforms-Economic reforms towards more liberalization-Agriculture,industry and services-Government reforms and the emerging energy-economy-environment regulatoryframework
(06 Hours)

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Unit 3 : Financial Reporting, Statements and Analysis
Accounting principles, concepts and conventions,Accounting process, Preparation of Financial statements, Financial Reporting, Reporting practices,Analysis of Financial Statements with managerial perspective. Students should be provided adequatetraining in understanding and analysing published financial statements of a company.
(06 Hours)
Unit 4 : Marketing Management
Introduction to Marketing Management-Analysing Marketing Environmentand Competition- Consumer Behaviour- Market Segmentation- Target Marketing- Positioning forCompetitive Advantage- Product/ Service, Product Classification, Branding- Product Life Cycle, NewProduct Development and Product Extension Strategies- Pricing- Place- Promotion Decisions
(06 Hours)
Unit 5 : Project Management
Project Lifecycle understanding-Project definition. WBS (Work BreakdownStructure), Planning Scope-Planning Schedule-CPM and PERT, Schedule Compressions-Costestimation & Quality definition-Planning Resources & Risks-Stakeholder identification, analysis andcommunication planning-Understanding different fundamental contract types and some of thevariants-Earned value management-Behavioural aspects in project management and project closure
(06 Hours)
Unit 6 : Business Communication
Introduction & Communication Basics-Just-A-Minute PresentationWorkshop-Jam Feedback and overcoming Glossophobia-Presentation–1 (Planning & Preparing)-Presentation–2 (Visual Aids) Presentation–3 (Delivery)-Graded Team Presentations-Group 1-GradedTeam Presentations-Group 2-Reading, listening & Questioning-Writing Business Communicationbasics-Writing Reports, Proposals, Emails, Summaries-Graded Individual Presentations- Group 1-Graded Individual Presentations- Group 2-Presentation feedback, Bios and Resumes.
(06 Hours)

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Principles of Management	Tripathy PC & Reddy PN	Tata McGraw Hill	-	1999

Reference Books

1	Fundamentals of Management	Stephen A. Robbins & David A. Decenzo& Mary Coulter	Pearson Education	7th Edition	2011
2	Management	Stephen P. Robbins & Mary Coulter	Prentice Hall (India) Pvt. Ltd	10th Edition	2009

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Course Details:

Class	S. Y. B. Tech, Sem.-IV
Course Code and Course Title	**1AEHS252 - Professional Ethics**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	02
Evaluation Scheme: ISE/ESE	25/00

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1AEHS252_1	**Understand**ing basic purpose of profession, professional ethics and various moral and social issues. **(K^2)**
1AEHS252_2	**Aware**ness of professional rights and responsibilities of a Engineer, safety and risk benefit analysis of a Engineer. **(K^2)**
1AEHS252_3	Acquiring knowledge of various roles of Engineer In applying ethical principles at various professional levels. **(K^3)**
1AEHS252_4	Professional Ethical values and contemporary issues. **(K^3)**
1AEHS252_5	Excelling in competitive and challenging environment to contribute to industrial growth. **(K^4)**
1AEHS252_6	**Identify** the essential qualities for progressing in career. **(K^4)**

Course Contents:		
Unit 1	**Introduction to Professional Ethics:** Basic Concepts, Governing Ethics, Personal & Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts of Ethics, Value Education, Dimensions of Ethics, Profession and professionalism, Professional Associations, Professional Risks, Professional Accountabilities, Professional Success, Ethics and Profession.	**05 Hrs**
Unit 2	**Basic Theories:** Basic Ethical Principles, Moral Developments, Deontology, Utilitarianism, Virtue Theory, Rights Theory, Casuist Theory, Moral Absolution, Moral Rationalism, Moral Pluralism, Ethical Egoism, Feminist Consequentialism, Moral Issues, Moral Dilemmas, Moral Autonomy.	**05 Hrs**
Unit 3	**Professional Practices in Engineering:** Professions and Norms of Professional Conduct, Norms of Professional Conduct vs. Profession; Responsibilities, Obligations and Moral Values in Professional Ethics, Professional codes of ethics, the limits of predictability and responsibilities of the engineering profession, Central Responsibilities of Engineers, The Centrality of Responsibilities of Professional Ethics; lessons from 1979 American Airlines DC-10 Crash and Kansas City Hyatt Regency Walk Away Collapse.	**05 Hrs**
Unit 4	**Work Place Safety, Rights & Responsibilities:** Safety and Risk, Assessment of Safety and Risk, Risk Benefit Analysis and Reducing Risk, Respect for Authority, Collective Bargaining,	**05 Hrs**

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	Confidentiality, Conflicts of Interest., Occupational Crime, Professional Rights, Employee Rights, Intellectual Property Rights (IPR), Discrimination	
Unit 5	**Global issues in Professional Ethics:** Multinational Corporations, Environmental Ethics, Computer Ethics, Weapons Development, Engineers as Managers, Consulting Engineers, Engineers as Expert Witnesses and Advisors, Moral Leadership, Code of Conduct, Corporate Social Responsibility.	**05 Hrs**
Unit 6	**Developing Career Trust:** Getting Ahead in Your Career, Learning Strategies, Perception, Life Span Changes, and Developing Good Work Habits.	**03 Hrs**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Professional Ethics	R. Subramanian	Oxford University Press	-	2015
02	Ethics in Engineering	Mike W. Martin and Roland Schinzinger	"Tata McGraw Hill,	-	2003
03	Ethics in Engineering Practice & Research	Caroline Whitbeck	New Delhi"	2nd	2015

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Ethics, Concepts Cases	Charles E Harris Jr., Michael S Pritchard, Michael J Rabins	Cengage learning	4th	2015
02	Business Ethics concepts & Cases	Manuel G Velasquez	PHI	6th	2008

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Department of Aeronautical Engineering

Course Details:

Class	S. Y. B. Tech, Sem.-IV
Course Code and Course Title	**1AEMC253 - Environmental Studies**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	02/00
Credits	00
Evaluation Scheme: ISE/ESE	25/00

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1AEMC253_1	**Know** importance and scope of environmental studies. **(K^2)**
1AEMC253_2	**Explain** the importance of public awareness on environmental problems. **(K^2)**
1AEMC253_3	**Explain** about natural resources and biodiversity. **(K^2)**
1AEMC253_4	**Describe** scientific, technological and economic solutions to environmental problems. **(K^3)**
1AEMC253_5	**Explain** the pollution control and waste management. **(K^3)**

Course Contents:		
Unit 1	**Nature of Environmental Studies:** Definition, scope and importance. Multidisciplinary nature of environmental studies Need for public awareness.	**02 Hrs**
Unit 2	**Natural Resources:** Water resources, Mineral resources, Forest resources, Food resources, Land resources, Energy resources – Different types of energy, Conventional sources & non-Conventional sources of energy Solar energy, Hydro electric energy, Wind Energy, Nuclear energy, Fossil Fuels, Hydrogen as an alternative energy.	**05 Hrs**
Unit 3	**Ecosystems:** Definition, Scope and Importance ecosystem. Classification, Structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Energy flow in the ecosystem, Bio-magnification, Bioaccumulation, ecosystem value.	**05 Hrs**
Unit 4	**Biodiversity and its conservation:** Introduction - Definition: genetic, species and ecosystem diversity. Bio-geographical 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, man wildlife conflicts; Conservation of biodiversity- In-situ and Ex-situ conservation. National biodiversity act.	**05 Hrs**
Unit 5	**Environmental Pollution:** Water Pollution, Noise pollution, Land Pollution, Public Health Aspects, Global Environmental Issues: Population Growth, Urbanization, Land Management, Water & Waste Water Management. Air Pollution: Effects – Global Warming, Acid rain & Ozone layer depletion, controlling measures.	**05 Hrs**

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Unit 6	**Social Issues and the Environment:** Disaster Management and Urban Problems, role of non-governmental organization, water conservation, rain water harvesting, Waste management and watershed management. Environmental ethics: Issues and possible solutions, Environmental Legislation and Acts.	06 Hrs
	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. (Hand written field work Report is mandatory.)	06 Hrs

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Environmental Studies	Dr. P. D. Raut	Shivaji University, Kolhapur.	5th	2013
02	Environmental Studies	Benny Joseph	Tata Mc- Graw Hill Publication	-	2005
03	Environmental Studies	R.J.Ranjit Daniels and Jagadish Krishnaswamy	Wiley India Private Ltd., New Delhi	-	2009
04	Environmental Studies – From Crisis to Cure	R Rajagopalan	Oxford University Press	-	2005

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Principals of Environmental Science and Engineering	Raman Sivakumar	Cengage learning Singapore	2nd	2005
02	Elements of Environmental Science and Engineering	P. Meenakshi	Prentice Hall of India Private Limited, New Delhi	-	2006
03	Environmental Science – working with the Earth	G.Tyler Miller Jr	Thomson Brooks /Cole	11th	2006
04	Environmental Law	Dharmendra S Sengar	Prentice Hall of India PVT LTD, New Delhi	-	2007

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Course Details:

Class	T. Y B.Tech, Sem.-VI (Aeronautical)
Course Code and Course Title	**1AEHS353 Constitution of India**
Prerequisite/s	NIL
Teaching Scheme: Lecture/Tutorial	02/00
Credits	2
Evaluation Scheme: ISE/ESE	25/00

Course Outcomes (COs):
Upon successful completion of this course, the student will be able to:

1AEHS353_1	**Understand** the basic features and modalities about Indian constitution.(K^2)
1AEHS353_2	**Understand** the functioning of Indian parliamentary system at the center and state level.(K^2)
1AEHS353_3	**Understand** the different aspects of Indian Legal System and its related bodies.(K^2)
1AEHS353_4	**Apply** different laws and regulations related to engineering practices.(K^3)
1AEHS353_5	**Differentiate** the role of Engineers in different organizations and governance.(K^4)

Course Contents:

Unit 1	**Introduction to Indian Constitution:** The Necessity of the Constitution, The Societies before and after the Constitution adoption. Introduction to the Indian constitution, The Making of the Constitution, The Role of the Constituent Assembly - Preamble and Salient features of the Constitution of India. Fundamental Rights and its Restriction and limitations in different Complex Situations. Directive Principles of State Policy (DPSP) and its present relevance in our society with examples. Fundamental Duties and its Scope and significance in Nation building.	**04 Hrs**
Unit 2	**Union Executive and State Executive:** Parliamentary System, Federal System, Centre-State Relations. Union Executive – President, Prime Minister, Union Cabinet, Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Supreme Court of India, Judicial Reviews and Judicial Activism. State Executives – Governor, Chief Minister, State Cabinet, State Legislature, High Court and Subordinate Courts, Special Provisions (Articles 370.371,371J) for some States.	**04 Hrs**
Unit 3	**Introduction to the Legal System in India:** Sources of Law and the Court Structure: Enacted law -Acts of Parliament are of primary legislation, Common Law or Case law, Principles taken from decisions of judges constitute binding legal rules. The Court System in India and Foreign Courtiers (District Court, District Consumer Forum, Tribunals, High Courts, Supreme Court). Arbitration: As an alternative to resolving disputes in the normal courts, parties who are in dispute can agree that this	**04 Hrs**

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	will instead be referred to arbitration. Contract law, Tort, Law at workplace.	
Unit 4	**Intellectual Property Laws and Regulation to Information:** Introduction, Legal Aspects of Patents, Filing of Patent Applications, Rights from Patents, Infringement of Patents, Copyright and its Ownership, Infringement of Copyright, Civil Remedies for Infringement, Regulation to Information Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act..	**06 Hrs**
Unit 5	**Business Organizations & Laws:** Sole Traders, Partnerships: Companies: The Company's Act: Introduction, Formation of a Company, Memorandum of Association, Articles of Association, Prospectus, Shares, Directors, General Meetings and Proceedings, Auditor, Winding up.	**06 Hrs**
Unit 6	**E-Governance and Role of Engineers:** E-Governance, Meaning and Concept, Role of Engineers in E-Governance, Need for reformed engineering serving at the Union and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in few states creating hurdles in Industrial development.	**04 Hrs**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Introduction to the Indian Constitution	Brij Kishore Sharma	PHI Learning Pvt. Ltd.	8	2017
02	Introduction to the Constitution of India	Durga Das Basu	Prentice –Hall	-	2008

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Our Constitution: An Introduction to India's Constitution and constitutional Law	Subhash C. Kashyap	NBT	-	2018
02	Law relating to Intellectual Property Rights	Dr.M.K Bhandari	Central Law Publications, Allahabad	5	2017
03	Handbook on e-Governance Project Lifecycle	Department of Electronics & Information Technology, Government of India	National Institute for Smart Government	-	2012

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Course Details

Class	T. Y. B. Tech, Sem.-V
Course Code and Course Title	**1AEHS352, Communication Skills and Competencies**
Prerequisite/s	NIL
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE/ESE	**25/00**

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1AEHS352_1	**Understand** the most important communication skills required for becoming competent professionals(K^2)
1AEHS352_2	**Understand** the 4 modules of competencies required for excelling in IELTS examinations(K^2)
1AEHS352_3	**Understand** the various accents in English communication (K^2)
1AEHS352_4	**Apply** the Professional and General writing styles (K^3)
1AEHS352_5	**Apply** the Professional and General speaking styles (K^3)
1AEHS352_6	**Apply** the concepts of Presenting a topic with the use of effective body language and Audio/Visual Aids(K^3)

List of Experiments

Exp. No.	Titleof Experiment
1	Introduction to Communication Skills and Competencies for Engineers
2	Listening - Specific Information & General Understanding
3	Listening - Talks of Scientific/Technical Nature and Completing Information
4	Reading - Making Judgements about the written text's content (Evaluative Comprehension)
5	Reading - Connecting the text to other written passages and situations (Inferential Comprehension)
6	Writing - Emails and Etiquettes
7	Writing - Analytical & Issue Based Essays
8	Writing - Reports and Proposals
9	Speaking - Understanding Accents and Neutralization of Accent
10	Speaking - Self Introduction & Elevator Pitch
11	Speaking - Extempore Speeches
12	Presentation Skills - Organizing Content, Body Language, Use of Audio/Visual Aids

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Communication Skills for	Sunita Mishra	Pearson	-	-

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	Engineers	C. Muralikrishna	Education		
2	Technical English	Dr. M Sambaiah	Wiley	-	-

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Communication Skills	Sanjay Kumar &Pushp Lata	Oxford University Press	-	2018
2	Basic Oral Communication Skills	British Council	Addison Wesley Longman ELT Division	-	1984

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Course Details:

Class	B. Tech., Sem.-VII
Course Code and Course Title	**1AEHS407 - Project and Finance Management**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I/MSE/ISE II/ESE	10/30/10/50

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
IAEHS407_1	**Describe** the role of economics involved in the decision making process.
IAEHS407_2	**Calculate** the rate of return, depreciation charges and taxes.
IAEHS407_3	**Apply** different cost entities in estimation, and explain the importance of finance functions.
IAEHS407_4	**Apply** globally accepted project management techniques for successful implementation of projects
IAEHS407_5	**Apply** appropriate communication techniques for successful project management.

Course Contents:		
Unit 1	**Managerial Economics** The Economic way of thinking-Demand Analysis I-Demand Analysis II & Estimation-Production & Costs I-Production & Costs: II-Profit-Maximization & Competitive Markets- Price-Searchers, Cartels, Oligopoly-Advanced Pricing and Auctions-Game Theory and Asymmetric Information Types of Business Organization - Sole proprietorship, partnership, company-public and private sector enterprises - Organization culture and Environment - Current trends and issues in Management.	**07 Hrs**
Unit 2	**Indian Economy and Policy** Introduction to the course-Colonialism and development of the Indian economy - De-industrialization of Indian economy-Business enterprises-Growth and economic reforms-Poverty and Inequality-Macroeconomic overview and Fiscal and Monetary Policy-Financial sector performance and impending reforms-Economic reforms towards more liberalization-Agriculture, industry and services-Government reforms and the emerging energy-economy-environment regulatory framework.	**06 Hrs**
Unit 3	**Financial Reporting, Statement and Analysis** Accounting principles, concepts and conventions, Accounting process, Preparation of Financial statement, Financial Reporting, Reporting practices, Analysis of financial statements with managerial perspective. Understanding and analyzing published financial statements of a company.	**08 Hrs**
Unit 4	**Project Management: Scope, Schedule and Cost Management** Project Lifecycle understanding-Project definition. WBS (Work Breakdown	**07 Hrs**

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	Structure), Planning Scope-Planning Schedule-CPM and PERT, Schedule Compressions-Cost estimation & Quality definition-Planning Resources & Risks-Stakeholder identification, analysis and communication planning-Understanding different fundamental contract types and some of the variants-Earned value management-Behavioural aspects in project management and project closure	
Unit 5	**Project Management: Quality and Risk Management** Quality definition-Planning Resources & Risks-Stakeholder identification, analysis and communication planning-Understanding different fundamental contract types and some of the variants-Earned value management-Behavioural aspects in project management and project closure	**08 Hrs**
Unit 6	**Project Management: Business Communication** Introduction & Communication Basics; Just-A-Minute Presentation Workshop-Jam, Feedback and overcoming Glossophobia - Presentation–1 (Planning & Preparing) - Presentation–2 (Visual Aids) Presentation–3 (Delivery)-Graded Team Presentations-Group 1-Graded Team Presentations-Group 2-Reading, listening & Questioning-Writing Business Communication basics-Writing Reports, Proposals, Emails, Summaries-Graded Individual Presentations- Group 1-Graded Individual Presentations- Group 2-Presentation feedback, Bios and Resumes.	**06 Hrs**

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Economics	Samuelson. Paul A and Nordhaus W.D.	McGraw Hill	20th	2019
02	A Guide to the Project Management Body of Knowledge (PMBOK)	Project Management Institute	Project Management Institute	7th	2017

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Fundamentals of Financial Management	Prasanna Chandra	Tata McGraw Hill Publishing Ltd.	4th	2005

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Course Details: Environmental Studies

Class	B. Tech, Sem.-IV
Course Code and Course Title	**0AUMC211, Environmental Studies**
Prerequisite/s	--
Teaching Scheme: Lecture	02
Credits	--
Evaluation Scheme: ISE/ESE	50/00

Course Objectives: The course enables students to,	
01	Gain knowledge of nature and the facts about environment.
02	Create awareness about scientific, technological, economic and political solutions to environmental problems.
03	Understand interrelationship between living organism and environment.
04	Acquire knowledge of the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value.
05	Create awareness about integrated themes and biodiversity, natural resources, pollution control and waste management.

Course Outcomes (COs): Upon successful completion of this course, the student will be able to,	
0AUMC211.1	**Explain** importance of environmental studies with necessary of acts.(K^2)
0AUMC211.2	**Explain** importance of public awareness on environmental problems (K^2)
0AUMC211.3	**Write a technical report** in team regarding course and impacts of environment related issues.(S^2)
0AUMC211.4	**Discuss** current concern of environment issues.(A^2)
0AUMC211.5	**Describe** the need of environment protection and ethics. (A^2)

Course Contents:		
Sr.No.	**Contents**	**Contact Hrs.**
Unit 1	**Nature of Environmental Studies.** Definition, scope and importance. Multidisciplinary nature of environmental studies Need for public awareness.	**02**
Unit 2	**Natural Resources.** a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people; b) Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non-renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy, f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.	**04**

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Unit 3	**Ecosystems** 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, characteristics features, structure and function of the following ecosystem :- a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem d)Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	**04**
Unit 4	**Biodiversity and its conservation** Introduction- Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega- diversity nation. Western Ghat as a biodiversity region. Hot-spots of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man- wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**05**
Unit 5	**Environmental Pollution** Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.	**04**
Unit 6	**Social Issues And The Environment** Disaster management: floods, earthquake, cyclone, tsunami and landslides Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products.	**03**
Unit 7	**Environmental Protection** From Unsustainable to Sustainable development Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights	**03**

Mini Project	**Mini project based on :** Environmental assets River/Forest/Grassland/Hill/Mountain. OR A local polluted site Urban/Rural/Industrial/Agricultural. OR Study of common plants, insects, and birds. OR Study of simple ecosystems - ponds, river, hill slopes, etc. **(Mini Project report is Mandatory.)**

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Assessment Method:

1. Mini Project report – 10 marks
2. ISE question paper format will be Multiple Choice Questions- 40 Marks

Unit No.	Topic Name	Weightage
1	Nature of Environmental Studies.	4 Marks
2	Natural Resources.	7 Marks
3	Ecosystems	7 Marks
4	Biodiversity and its conservation	7 Marks
5	Environmental Pollution	7 Marks
6	Social Issues and the Environment	8 Marks

IMPORTANT NOTES:

1. **ISE will be conducted in 14th week of semester.**
2. **Mini Project report will be submitted to course coordinator in 10th week of semester.**
3. **Students should get minimum 40% marks to get PP (PASS) grade.**
4. **Students getting less than 40% marks will be offered NP (NOT PASS) grade.**
5. **To get B. Tech. Degree PP grade in Environmental Studies is mandatory.**

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Environmental Studies	Dr. B. S. Chauhan	University Science Press, New Delhi	1	2008
02	Environmental Studies	Dr. P. D. Raut	S. U. Kolhapur	3	2011

Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Principals of Environmental Science and Engineering	Raman Sivakumar	Cengage learning, Singapore	2	2005
02	Elements of Environmental Science and Engineering	P. Meenakshi	Prentice Hall of India Private Limited, New Delhi	-	2006
03	Environmental Science – working with the Earth	G.Tyler Miller Jr	Thomson Brooks /Cole	11	2006

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Department of Automobile Engineering

Course Details: Professional Skills Development-I

Class	B. Tech, Sem.-IV
Course Code and Course Title	**0AUHS264, Professional Skills Development-I**
Prerequisite/s	0AUHS213
Teaching Scheme: Practical	02
Credits	01
Evaluation Scheme: ISE / ESE	25/00

Course Objectives: The course enables students to:	
01	Create awareness about professional skills.
02	Acquire essential skills of oral and written communication.
03	Aware about skills required in different departments of company.
04	Identify skills for automobile engineer in service sector of automobile.
05	Prepare technical proposal for company.

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
0AUHS264.1	Describe significance of professional skills. **(K^1)**
0AUHS264.2	Summarize the functions of automobile engineer in different departments of company. **(K^2)**
0AUHS264.3	Explain role of automobile engineer in service sector of automobile. **(K^2)**
0AUHS264.4	Conduct mock meeting in organization. **(S^3)**
0AUHS264.5	Use prerequisite skills in oral and written communication. **(S^3)**

List of Assignments:		
Assign. No.	**Title**	**Contact Hrs.**
01	Professional skills development for automobile engineer in design department	**02**
02	Professional skills development for automobile engineer in maintenance department	**02**
03	Professional skills development for automobile engineer in production department	**02**
04	Professional skills development for automobile engineer in quality department	**02**
05	Professional skills development for automobile engineer in marketing department	**02**
06	Professional skills development for automobile engineer in service sector of automobile	**02**
07	Conduct Meeting and Prepare its Documentation (Notice, Agenda, Minutes of Mock Meetings)	**02**
08	Preparation of Technical Proposal for supply of automobile components (Group activity, document of the proposal)	**02**
09	Reading and understanding of scientific journal paper (structure of a journal paper, process of publishing a journal paper)	**02**

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10	Prepare seminar or conference presentation (Structuring talk)	02

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Interpersonal Skills at Work	John Hayes	Routledge, New York	2	2002
2	Plan and Conduct Effective Meetings	Barbara J. Streibel	McGraw-Hill, New York	1	2007
3	Scientific and Technical Communication Writing for Engineers and Professionals	S.D. Sharma	Sarup and Sons, New Delhi	3	2007
4	Writing for Science and Engineering: Papers, Presentations and Reports	Heather Silyn-Roberts	Butterworth-Heinemann, Woburn, US	1	2000

Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Make and Test Projects in Engineering Design	Andrew Emery Samuel	Springer-Verlag, London	1	2006
2	Sustainability in Engineering Design	Anthony Johnson, Gibson	Elsevier, London	1	2014
3	Engineering Maintenance Management (Industrial Engineering)	Ricky Smith, Bruce Hawkins	Elsevier Butterworth–Heinemann, Oxford, UK	2	2004
4	Production and Operations Management	N. Suresh, S. Anil Kumar	New Age International, New Delhi	2	2008

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Department of Automobile Engineering

Course Details

Class	T. Y. B.Tech, Sem V
Course Code and Course Title	0AUHS356,**Professional Skills Development – II**
Prerequisite/s	0AUHS264
Teaching Scheme: Lecture/Tutorial	00/02
Credits	02
Evaluation Scheme: ISE / ESE	25/00

Course Objectives: The course enables the student to,	
01	Possess Good communication skills.
02	Form network between the students and other community.
03	Apply Corporate ethics.
04	Conduct assembly meeting and documentation.

Course Outcomes (COs) Upon successful completion of this course, the student will be able to:	
0AUSH356_1	**Demonstrate** techniques to prepare formal engineering report and technical proposal. (K^2)
0AUSH356_2	**Recognize**interpersonal skills, corporate ethics and etiquette. (K^2)
0AUSH356_3	**Prepare** professional letters and resumes. (S^2)
0AUSH356_4	**Plan** a formal meeting along with necessary documentation. (S^2)
0AUSH356_5	**Exhibit** professional and ethical attitude through behavior in lab sessions and co-operate with members of batch during lab work. (A^2)

List of Experiments

Expt. No.	Title of Experiment
1	Report Writing (Synopsis or the first draft of the Report)
2	Technical Proposal (Group activity, document of the proposal)
3	Interpersonal Skills (Group activity and Role play)
4	Interpersonal Skills (Documentation in the form of soft copy or hard copy)
5	Meetings and Documentation (Notice, Agenda, Minutes of Mock Meetings)
6	Corporate ethics and etiquettes (Case study, Role play)
7	Cover Letter and Resume
8	Right to information act 2005
9	Apprentice training act 1961
10	Interlinked skills-personal-social-professional

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Text Books:					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Interpersonal Skills at Work	John Hayes	Routledge, New York	2nd	2002
2	Plan and Conduct Effective Meetings	Barbara J. Streibel	McGraw-Hill, New York	1st	2007
3	Scientific and Technical Communication Writing for Engineers and Professionals	S.D. Sharma	Sarup and Sons, New Delhi	3rd	2007
4	Writing for Science and Engineering: Papers, Presentations and Reports	Heather Silyn-Roberts	Butterworth-Heinemann, Woburn, US	1st	2000

Reference Books:					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Make and Test Projects in Engineering Design	Andrew Emery Samuel	Springer-Verlag, London	1st	2006
2	Sustainability in Engineering Design	Anthony Johnson, Gibson	Elsevier, London	1st	2014
3	Engineering Maintenance Management (Industrial Engineering)	Ricky Smith, Bruce Hawkins	Elsevier Butterworth–Heinemann, Oxford, UK	2nd	2004
4	Production and Operations Management	N. Suresh, S. Anil Kumar	New Age International, New Delhi	2nd	2008

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Annasaheb Dange College of Engineering and Technology, Ashta
(An Autonomous Institute)

Department of Automobile Engineering

Course Details:

Class	T. Y. B. Tech, Sem.-V
Course Code and Course Title	**0AUAC357, Entrepreneurship and Business Startup**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	2/0
Credits	--
Evaluation Scheme: ISE / ESE	50/00 (Grade)

Course Objectives: The course enables the student to,	
01	Comprehend the concept of entrepreneurship development,the theories of entrepreneurship and the relationship betweentheory and practice.
02	Create awareness of the role of entrepreneurs in the growthof Indian economy.
03	Comprehend the process of creating an entrepreneurialventure
04	Enhance analytical skills for,evaluating new venture ideasand understanding both the opportunities and constraints faced by entrepreneurs
05	Enhance an entrepreneurial spirit and have feasible ideas forventures.

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
0AUAC357_1	**Explain** the fundamentals involved in entrepreneurshipdevelopment.(K^2)
0AUAC357_2	**Evaluate** opportunities for a new venture. (K^3)
0AUAC357_3	**Demonstrate** the ability to prepare a business plan for aventure(S2)
0AUAC357_4	**Exhibit** professional and ethical attitude through behavior and co-operate with members. (A^2)
0AUAC357_5	**Communicate** effectively and Exhibit Technical Curiosity. (S^2)

Course Contents:		
Unit 1	**Entrepreneurship:** Entrepreneur characteristics, Classification of Entrepreneurships, Incorporation of Business, Forms of Business organizations, Role of Entrepreneurship in economic development, Start-ups.	**07 Hrs.**
Unit 2	**Idea Generation:** Ideas in Entrepreneurships, Sources of New Ideas, Techniques for generating ideas.	**02 Hrs.**
Unit 3	**Opportunity Assessment:** Opportunity Recognition, Steps in tapping opportunities.	**02 Hrs.**
Unit 4	**Project Formulation:** Preparation of Project Report, Content, Guidelines for Report preparation.	**03 Hrs.**

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Unit 5	**Project Appraisal :** Project Appraisal techniques, economic, Steps Analysis; Financial Analysis; Market Analysis; Technical Feasibility.	04 Hrs.
Unit 6	**Institutions Supporting Small Business Enterprises:** Central level Institutions: NABARD; SIDBI, NIC, KVIC; SIDIO; NSIC Ltd; etc. – state level Institutions –DICs- SFC- SSIDC- Other financial assistance.	04 Hrs.
Unit 7	**Government Policy:** Government Policy for Small Scale Industries.	03 Hrs.
Unit 8	**Government Taxation &Benefits:** Tax Incentives and Concessions, Non-tax Concessions, Rehabilitation and Investment Allowances.	03 Hrs.

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Entrepreneurship	Mr. Arya Kumar	Pearson, Delhi	1st	2012
02	Entrepreneurship Development –Small Business Enterprises	Mrs. Poornima M.CH	Pearson, Delhi	1st	2009
03	Entrepreneurship and Innovation	Mr. Michael H. Morris, ET. al.,	Cen gage Learning, New Delhi,	2nd	2011
04	Management and Entrepreneurship	Mr. KanishkaBedi	Oxford University Press, Delhi	1st	2009

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Course Details:

Class	S. Y. B. Tech, Sem.-IV
Course Code and Course Title	**1AUHS205, Professional Practice, Law & Ethics**
Prerequisite/s	1AUHS154, 1AUHS159
Teaching Scheme: Lecture/Tutorial/Practical	02/00/00
Credits	02
Evaluation Scheme: ISE I/MSE/ISEII/ ESE	10/30/10/50

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1AUHS205_1	**Explain** human values for professional excellence and stress management(K^2)
1AUHS205_2	**Comply**with engineering ethicsin professional practices (A^2)
1AUHS205_3	**Practice** experimentationin engineering domain (A^2)
1AUHS205_4	**Explain** safety and risk assessment (K^2)
1AUHS205_5	**Exhibit** professional and ethical attitude through behavior in class and co-operate with members of batch during lab work. (A^2)

Course Content		
Unit 1	**Human Values** Morals, values and Ethics , Integrity ,Work ethic ,Service learning ,Civic virtue ,Respect for others ,Living peacefully ,Caring ,Sharing ,Honesty ,Courage ,Valuing time ,Cooperation ,Commitment ,Empathy ,Self-confidence ,	**05 Hrs.**
Unit 2	**Stress management.** Character,Spirituality, Introduction to Yoga and meditation for professional excellence and stress management.	**03 Hrs.**
Unit3	**Engineering Ethics** Senses of "Engineering Ethics" ,Variety of moral issues ,Types of inquiry ,Moral dilemmas ,Moral Autonomy ,Kohlberg's theory ,Gilligan's theory ,Consensus and Controversy ,Models of professional roles ,Theories about right action ,Self-interest ,Customs and Religion ,Uses of Ethical Theories.	**06 Hrs.**
Unit4	**Engineering As Social Experimentation** Engineering as Experimentation , Engineers as responsible Experimenters , Codes of Ethics ,A Balanced Outlook on Law	**03 Hrs.**
Unit5	**Safety, Responsibilities And Rights** Safety and Risk ,Assessment of Safety and Risk ,Risk Benefit Analysis and Reducing Risk ,Respect for Authority ,Collective Bargaining ,Confidentiality ,Conflicts of Interest ,Occupational Crime ,Professional Rights ,Employee Rights ,Intellectual Property Rights (IPR) ,Discrimination.	**05 Hrs.**
Unit6	**Global Issues** Multinational Corporations, Business Ethics - Environmental Ethics, Computer Ethics - Role in Technological Development, Weapons Development ,Engineers as Managers ,Consulting Engineers ,Engineers as Expert Witnesses	**06 Hrs.**

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	and Advisors ,Honesty ,Moral Leadership ,Sample Code of Conduct.	

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Professional Ethics in Engineering	I.A.Dhotre V.S.Bagad	Technical Publications	1st	2015
02	Engineering Ethics	Govindarajan M	Prentice Hall India Learning Private Limited	1st	2004
03	Professional Ethics	R. Subramanian	Oxford University Press	2nd	2017
04	Ethics in Engineering	Mike W. Martin and Roland Schinzinger,	Tata Mc Graw Hill, New Delhi,	4th	2003

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Ethics	Charles B. Fleddermann,	Pearson Prentice Hall, New Jersey	1st	2004
02	Engineering, Ethics, and the Environment	P. Aarne Vesilind , Alastair S. Gunn	Cambridge University Press	1st	1998

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Course Details:

Class	S.Y.B. Tech, Sem.-IV
Course Code and Course Title	**0AUMC211,Environmental Studies**
Prerequisite/s	--
Teaching Scheme: Lecture	02
Credits	--
Evaluation Scheme: ISE/ESE	50/00 (Grade)

Course Outcomes (COs): Upon successful completion of this course, the student will be able to,	
1AUMC211_1	**Explain** importance of environmental studies with necessary of acts.(K^2)
1AUMC211_2	**Explain** importance of public awareness on environmental problems (K^2)
1AUMC211_3	**Write a technical report** in team regarding course and impacts of environment related issues.(S^2)
1AUMC211_4	**Discuss** current concern of environment issues.(A^2)
1AUMC211_5	**Describe** the need of environment protection and ethics. (A^2)

Course Contents:		
Unit 1	**Nature of Environmental Studies.** Definition, scope and importance. Multidisciplinary nature of environmental studies Need for public awareness.	**02Hrs.**
Unit 2	**Natural Resources.** a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people; b) Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non-renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy, f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.	**04 Hrs.**
Unit 3	**Ecosystems** 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, characteristics features, structure and function of the following ecosystem :- a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem d)Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	**04 Hrs.**
Unit 4	**Biodiversity and its conservation** Introduction- Definition: genetic, species and ecosystem diversity. Bio-	**05 Hrs.**

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	geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega-diversity nation. Western Ghat as a biodiversity region. Hot-spots of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man-wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
Unit 5	**Environmental Pollution** Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.	**05 Hrs.**
Unit 6	**Social Issues And The Environment** Disaster management: floods, earthquake, cyclone, tsunami and landslides Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products.	**04 Hrs.**
Unit 7	**Environmental Protection** From Unsustainable to Sustainable development Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights	**04 Hrs.**

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Environmental Studies	Dr. B. S. Chauhan	University Science Press, New Delhi	1st	2008
02	Environmental Studies	Dr. P. D. Raut	S. U. Kolhapur	3rd	2011

Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Principals of Environmental Science and Engineering	Raman Sivakumar	Cengage learning, Singapore	2nd	2005
02	Elements of Environmental Science and Engineering	P. Meenakshi	Prentice Hall of India Private Limited, New Delhi	3rd	2006
03	Environmental Science – working with the Earth	G.Tyler Miller Jr	Thomson Brooks /Cole	11th	2006

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Course Details:

Class	T. Y. B. Tech, Sem.-V
Course Code and Course Title	**1AUMC309, Entrepreneurship and Business Startup**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	02/0
Credits	--
Evaluation Scheme: ISE / ESE	**50/00 (Grade)**

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:	
1AUMC309_1	**Explain** the fundamentals involved in entrepreneurship development.(K^2)
1AUMC309_2	**Evaluate** opportunities for a new venture. (K^5)
1AUMC309_3	**Develop** the ability to prepare a business plan for a venture (K^6)
1AUMC309_4	**Exhibit** professional and ethical attitude through behavior and co-operate with members. (A^2)
1AUMC309_5	**Communicate** effectively and Exhibit Technical Curiosity. (S^2)

Course Contents:		
Unit 1	**Entrepreneurship:** Entrepreneur characteristics, Classification of Entrepreneurships, Incorporation of Business, Forms of Business organizations, Role of Entrepreneurship in economic development, Start-ups.	**07 Hrs**
Unit 2	**Idea Generation:** Ideas in Entrepreneurships, Sources of New Ideas, Techniques for generating ideas.	**02 Hrs**
Unit 3	**Opportunity Assessment:** Opportunity Recognition, Steps in tapping opportunities.	**02 Hrs**
Unit 4	**Project Formulation:** Preparation of Project Report, Content, Guidelines for Report preparation.	**03 Hrs**
Unit 5	**Project Appraisal :** Project Appraisal techniques, economic, Steps Analysis; Financial Analysis; Market Analysis; Technical Feasibility.	**04 Hrs**
Unit 6	**Institutions Supporting Small Business Enterprises:** Central level Institutions: NABARD; SIDBI, NIC, KVIC; SIDIO; NSIC Ltd; etc. – state level Institutions –DICs- SFC- SSIDC- Other financial assistance.	**04 Hrs.**
Unit 7	**Government Policy:** Government Policy for Small Scale Industries.	**03 Hrs.**
Unit 8	**Government Taxation &Benefits:** Tax Incentives and Concessions, Non-tax Concessions, Rehabilitation and Investment Allowances.	**03 Hrs.**

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Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Entrepreneurship	Mr. Arya Kumar	Pearson, Delhi	1st	2012
02	Entrepreneurship Development –Small Business Enterprises	Mrs. Poornima M.CH	Pearson, Delhi	1st	2009
03	Entrepreneurship and Innovation	Mr. Michael H. Morris, ET. al.,	Cen gage Learning, New Delhi,	2nd	2011
04	Management and Entrepreneurship	Mr. KanishkaBedi	Oxford University Press, Delhi	1st	2009

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