

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Hingna Road, Wanadongri, Nagpur - 441 110

NAAC Accredited with 'A++' Grade

Ph.: 07104-242919, 242623, 242588


Website : www.ycce.edu E-mail : principal@ycce.edu

Summary

1.3.1 Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- List of the courses which address the Gender, Environment and Sustainability, Human Values and Professional Ethics




Principal
Yeshwantrao Chavan
College of Engineering
Wanadongri Hingna Road,
NAGPUR - 441110

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Hingna Road, Wanadongri, Nagpur - 441 110

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Office of Dean (Academic Matters)

Courses related to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum:

Professional Ethics:

CV2351	Steel Structures
CV2301	Reinforced Concrete Structures
CV2364	PE IV Earthquake Engineering
ME2305	Production Management.
ME2344	Project Evaluation & Management.
ME2445	Financial & Cost Management.
ME2464	Value Engineering
CV2327	PE I: Introduction to Geographical Information System

Environment and Sustainability:

CV2321	PE I Water Treatment
CV2333	OE I Environmental Management
CV2424	PE IV Waste Water Treatment
CV2207	Water Supply Engineering
ME2305	Production Management.
ME2344	Project Evaluation & Management.
ME2445	Financial & Cost Management.
ME2464	Value Engineering

Gender Sensitization and Human Values:

GE1108	Social Science
ME2464	Value Engineering
ME2344	Project Evaluation & Management.
CV2364	Elements of Earthquake Engineering

Dr. A.V. Patil
Dean (Academic Matters)

Dean (Acad)
Yeshwantrao Chavan
College of Engineering
Wanadongri Hingna Road
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Curriculum of Professional Ethics, Gender, Human values, Environment & sustainability Courses



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B.Tech SoE and Syllabus 2020

CIVIL ENGINEERING

VI Semester

CV2351 - Steel Structures

COURSE OBJECTIVES	COURSE OUTCOMES
Students will be introduced to 1. Structural steel components & its connection. 2. Tension member, compression member, lacing and batten built-up sections. 3. Laterally restrained and unrestrained beams 4. Pre-Engineered Building and column bases	Students will be able to 5. Explain type of structure and its design methodology 6. Calculate different types of loading with respect to structural parameters. 7. Apply Indian Standard code for design of steel structure components. 8. Analyze and design Steel simple, built-up sections and column bases
Mapped Program Outcomes : 1, 2, 3, 8, 9, 10 PSO : i	

UNIT-1 : Steel as a Structural Material: Physical and mechanical properties of Structural Steel, Merits and Demerits of Steel as a Structural Material, Grades of Structural Steel, Structural Steel Sections, IS 800:2007, Introduction to Limit State Method.	[06 Hrs.]
UNIT-2 : Connection: Types and Failure of Connections, Riveted Connection, Bolted Connection, Welded Connection, Strength and Efficiency of Joint.	[07 Hrs.]
UNIT-3 : Tension Member: Types of Tension Member, Stresses, Design of Tension Member Compression Member: Effective length, Slenderness ratio, Design of Compression Member.	[06 Hrs.]
UNIT-4 : Column: Design of Axially loaded columns, Design of Laced and Battened Columns (Design of Built-up Columns) with Bolted and Welded End Connection.	[07 Hrs.]
UNIT-5 : Design of Beam: Types of Beams, Lateral Stability of beams, Types of section, Stresses on Beam, Design of Laterally Supported Beam, Design of Laterally Unsupported Beam, Built-up Beams.	[06 Hrs.]
UNIT-6 : Column Bases Types of Column Bases, Slab Base, Gusset Base, Design of Slab Base and Gusseted Base. Introduction to pre Engineered Building (PEB).	[07 Hrs.]

Text Books:

- Fundamentals of Structural Steel Design, By M. L. Gambhir, McGraw Hill Education, 2013
- Design of Steel Structures, By N. Subramanian, OXFORD University Press, First Edition, 2008
- Limit State Design of Steel Structures, By S. K. Duggal, McGraw Hill Education Private Limited, 2011

Reference Books:

- Design of Steel Structures, LSM, By S. S. Bhavikatti, I. K. International Publication House Pvt. Ltd. 2009
- Structural Steel Design, By Jack C. McCormac), Stephen F. Csernak, 5th Edition Pearson Education Limited, 2013

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CIVIL ENGINEERING

VI Semester

CV2364 - PE-II : Earthquake Engineering

COURSE OBJECTIVES	COURSE OUTCOMES
Students will be introduced to 1. Geological study of earth and interior. 2. Various aspects of tall structures. 3. Detailing of RCC members for ductile behavior as IS code provisions. 4. Various effects of earthquakes on structures.	Students will be able to 1. Explain the fundamentals and Importance of Earthquake Engineering 2. Analyze and design the earthquake resistant structures and construction in accordance with the Provisions of Indian Standard Codes 3. Explain special aspects in Multi-story buildings. 4. Illustrate the damages caused due to past Earthquake in & outside India and remedial Measures
Mapped Program Outcomes : 1, 2, 3, 8, 9, 10, 12, PSO : i	

UNIT-1 : Origin of earthquakes, engineering geology, seismicity of the world, faults, earthquake waves, quantification of earthquake (magnitude, energy, intensity of earthquake), measurements of earthquake, analysis of earthquake records and its interpretation.	[07 Hrs.]
UNIT-2 : Determination of magnitude, epicenter, epicenter distances, focal depth, seismic zoning, ground motion and their characteristics, factors affecting ground motions, causes or sources of earthquake damages, evaluation of seismic hazards.	[06 Hrs.]
UNIT-3 : Study of IS: 1893-2016, IS: 13920-2016 for analysis and ductile detailing of RCC structures and other related codes, concept of earthquake resistant design, design philosophy, virtues of earthquake resistant design. Calculation of base shear distribution to various floors.	[06 Hrs.]
UNIT-4 : Design and detailing of RCC members, beam, column for ductility as per IS 13920-2016. Introduction to shear wall building and beam-column joints for ductile behaviors.	[07 Hrs.]
UNIT-5 : Special aspects in multi-storey buildings, effect of torsion, flexible first storey, P-delta effect, and soil-structure interaction on building response, drift limitation, soil liquefaction during earthquakes.	[07 Hrs.]
UNIT-6 : Load bearing structures, masonry structures, strengthening and rehabilitation of non-engineered building for earthquake, lessons from past earthquakes.	[06 Hrs.]

Text Books :

1. Agrawal & Shrikhande, Design of Earthquake Resistant Structures, 3rd 2006, Prentice – Hall of India Pvt. Ltd.
2. Roberto Villaverde, Fundamental Concepts of Earthquake Engineering, 2009, CRC Press
3. Asadour H. Hadjian, Basic Elements of Earthquake Engineering, 2015, Wiley

References Books :

1. C.V.R. Murty, Earthquake Tips, 2005, NICEE, IITK
2. www.nicee.org / iaee / E_FrontCover.pdf, NICEE Guidelines for Earthquake Resistant Non-Engineered Construction, 2004, National information center of Earthquake engineering Indian Institute of Technology Kanpur Kanpur 208016, India.
3. Robin K. McGuire, Seismic Hazard and Risk Analysis, 2004, Earthquake Engineering Research Institute; First edition.
4. Farzad Naeim, Handbook on Seismic Analysis and Design of Structures, 2001, Kluwer Academic Publisher
5. Paulay, T. & Prestiley M.J.N., Seismic design of R C & Masonry Buildings, 2nd 1999, John Willey & Sons

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B.Tech SoE and Syllabus 2020

CIVIL ENGINEERING

III Semester

CV2207 - Water Supply Engineering

COURSE OBJECTIVES	COURSE OUTCOMES
Students will be introduced to 1. Water demand, components of public water supply scheme and population forecasting. 2. Conveyance of water, water quality and objectives of water treatment. 3. Working of various water treatment units and distribution system. 4. Solid waste management.	Students will be able to 1. Predict population forecasting including design of water conveyance system and raising main. 2. Explain different characteristics of water and water treatment methods. 3. Classify different methods and patterns of distribution of water. 4. Illustrate various methods of solid waste management.
Mapped Program Outcomes : 1, 3, 6, 7, 8, 9, 10, 12	

UNIT-1 : Introduction, Importance and necessity of water supply scheme, Water demand: Types of demand, factors affecting per Capita demand, variation in demand, design period and methods of population forecasting.	[07 Hrs.]
UNIT-2 : Conveyance of water: Types of pipes, joints in pipes, valves and fittings, Intake structures: Location types – river, lake, canal reservoir, Hydraulic design of rising mains. Pump: Classification, working, merits, demerits & selection of pumps.	[06 Hrs.]
UNIT-3 : Water quality: General idea of water borne diseases, Physical, Chemical, and bacteriological characteristics and analysis of water, Standards of drinking water. Water treatment: Objective of treatment, unit operations and processes, Flow sheet of conventional water treatment plant. Aeration: Purpose, types of aerators. Coagulation and Flocculation: Definition, Principles, types of coagulants and reactions, coagulant doses, types of mixing and flocculation devices.	[06 Hrs.]
UNIT-4 : Sedimentation: Principles, types of settling basins, inlet and outlet arrangements. Clariflocculators. Filtration: Mechanism of filtration, types of filters, working, operational problems in filters.	[07 Hrs.]
UNIT-5 : Disinfection: Purpose, Mechanism, criteria for good disinfectant, types of disinfectants, chlorination. Distribution systems: Requirements for a good distribution system, methods of distribution, systems and their layouts, Leakage and leak-detector. Storage reservoirs for treated water: Types, capacity of reservoir, mass curve.	[06 Hrs.]
UNIT-6 : Introduction to Municipal solid waste management: Generation sources, composition, Quality, Methods of Collection, transportation, treatment and disposal, 3 R's of solid waste management.	[07 Hrs.]

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CIVIL ENGINEERING

V Semester

CV2321 – PE-I : Water Treatment

COURSE OBJECTIVES	COURSE OUTCOME
Students will be introduced to 1. Various treatment processes and their fundamentals. 2. Various water treatment units and their working. 3. Design of water treatment units.	Students will be able to 1. Understand working of water treatment units and their significance in water treatment. 2. Understand fundamentals of unit processes and analyse data related to the processes. 3. Design different water treatment units.
Mapped Program Outcomes : 1, 3, 7	

UNIT-1 : Introduction: Water treatment objectives, Water quality standards and regulations, Aeration: Objectives, Principles, Various methods, Design of aerators.	[06 Hrs.]
UNIT-2 : Coagulation: Need for coagulation, chemistry of coagulation, various coagulants used in the process, Factors affecting efficiency of coagulation process. Design of flash mixer Flocculation: Theory of flocculation, slow mixing devices.	[07 Hrs.]
UNIT-3 : Sedimentation: Stoke's law, working of ideal sedimentation tank, Types of sedimentation tanks, design of rectangular sedimentation tank, Working and Design of clariflocculator. Operational problems in sedimentation tanks.	[07 Hrs.]
UNIT-4 : Filtration: Theory of filtration, Types of filters, Slow and rapid sand filters, Operation of rapid sand filters, Operational difficulties, Design of rapid sand filter.	[06 Hrs.]
UNIT-5 : Disinfection: Various methods of disinfection, Chlorination, Chemistry of chlorination, Methods of chlorination.	[07 Hrs.]
UNIT-6 : Other Processes: Adsorption, Theory, Granular and powder activated carbon, Performance and reactivation. Application in water treatment Defluoridation, Effects of fluorides on human health. Different methods of removal, Ion Exchange, Materials and reactions.	[06 Hrs.]

Text Books :

1. P.N. Modi, Water Supply and treatment, Standard Book House.
2. CPHEEO Manual on Water Supply and Treatment.

Reference Books :

1. Fair, Geyer and Okun, Water and wastewater engineering Vol. 2, John Wiley and Sons, New York
2. Franklin Burton, Stensel, Waste Water Engineering, Tata Mc Graw Hill.
3. Dr. B.C. Punmia, Waste Water Engineering, Firewall Media.

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CIVIL ENGINEERING

V Semester

CV2322- PE-I : LAB - Water Treatment

COURSE OBJECTIVES	COURSE OUTCOME
Students will be introduced to 1. Various water quality standard. 2. Determination of various characteristics of water. 3. Design of water treatment units.	Students will be able to 1. Understand working of water treatment units and their significance in water treatment. 2. Understand fundamentals of unit processes and analyse data related to the processes. 3. Design different water treatment units.
Mapped Program Outcomes : 1, 3, 7	

A. Any SIX experiments of the following will be performed.

1. To determine Alkalinity of a water sample.
2. To determine Dissolved Oxygen concentration in given water sample.
3. To determine Sulphates concentration in given water sample.
4. To determine Maximum Probable Number (MPN) of coli form bacteria present in water sample by Multiple Tube Dilution (MTD) technique-presumptive test and confirmation tests
5. To determine Density of bacteria in a water sample pour plate (Standard Plate Count) method.
6. To determine concentration of Chlorides in a given water sample.
7. To determine effective size and co-efficient of uniformity of a given sand sample and to separate required sand from given stack of sand for required effective size and coefficient of uniformity.
8. To determine total, dissolved and suspended solids in given water sample.

B. To Design various Water Treatments Units (Any Three)

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CIVIL ENGINEERING

V Semester

CV2323– PE-I : Environmental Management

COURSE OBJECTIVES	COURSE OUTCOME
Students will be introduced to 1. Various analysis tools of environmental management 2. Role of impact assessment studies in environmental management 3. Importance of environmental legislations and audit 4. Natural resources, challenges & prospects for sustainable development.	Students will be able to 1. Explain the importance of environmental management tools. 2. Illustrate the procedures impact assessment studies in environmental management 3. Explain environmental legislations and policies for environmental resources. 4. Explain the need of resource management and its challenges for sustainable development
Mapped Program Outcomes : 6, 7, 8, 9, 10, 12	

UNIT-1 : Introduction to Environmental Management Development and Environment, environmental attributes, nature of impact – primary, secondary, tertiary, short –term long-term, local and regional, reversible & Irreversible impacts. Overview of impacts –directly & indirectly measurable impacts with respect to air, noise, land, biological & socio-economic environment.	[06 Hrs.]
UNIT-2 : Introduction to Environmental Impact Assessment: need for EIA, concept of EIA, elements of EIA Role and Status of EIA in India EIA Procedures, Environmental Impact Statement, Methodologies of EIA.	[07 Hrs.]
UNIT-3 : MoEF questionnaire for environmental clearance, critical environmental issues and formulation of strategies of EMP, environmental management plan, development of action plans for critical environmental education programmers. EMS.	[07 Hrs.]
UNIT-4 : Environmental legislation – basic concepts, critical issues, civil liability, various enactment and their provisions – Water Act (1974, 1988), forest Conservation Act (1980), Air Act (1981, 1988), Water (Cess) Act 1977, Environmental Protection Act 1986, public Liability & Insurance Act, Motor Vehicle Act 1989, Rules, Role of State & Central boards of pollution control, local government social action groups, and environmental policies.	[07 Hrs.]
UNIT-5 : Environmental Audit- Concept of EA, procedural aspects of conducting environmental audit, Eco-Labeling, LCA.	[06 Hrs.]
UNIT-6 : Resource Management: depletion of resources – causes & effects, resource utilization, , optimal use of resources.	[06 Hrs.]

Text Books :

1. Anand Bal, An Introduction to Environmental Management, Himalaya Publishing House.,2009
2. John Rau & Wooten, Environmental Impact Assessment, Mc Graw Hill.
3. Larry Canter, Environmental Impact Assessment, McGraw Hill.
4. Harry W. Gehm, Jacob I. Bregman, handbook on pollution Control Acts, Central Pollution Control Board, New Delhi.
5. R.K. Sapra, S. Bhardwaj, the New Environmental Age, Ashish Pub. House, New Delhi.

References Books :

1. Rosencrannz, S. Divan, M.L. Nobal, Environmental Law and Policy in India, Cases, Materials and Statutes, Tripathi Pvt. Ltd. Bombay.

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CIVIL ENGINEERING

V Semester

CV2327– PE-I : Geographical Information Systems

COURSE OBJECTIVES	COURSE OUTCOMES
Students will be introduced to 1. Fundamentals and components of Geographic Information System 2. Various types of Spatial and Non-Spatial data and its measurement techniques. 3. Various data Spatial and Non-Spatial models, coordinate systems, map projections, types of surfaces and operations in GIS. 4. Application of GIS in civil engineering problems.	Students will be able to 1. Explain basic concepts, components and terminologies related to GIS. 2. Differentiate various types of data and its measurement techniques. 3. Explain various data models, coordinate systems, map projections, types of surfaces and operations in GIS. 4. Examine the application GIS in civil engineering problems.
Mapped Program Outcomes : 1, 8, 9, 10	

UNIT-1 : Introduction - A Brief History of GIS - Geographical concepts and terminology - Essential components of GIS -utility of GIS- Hardware, Software, Data, People, Methods – Proprietary and open source Software Various GIS packages.	[06 Hrs.]
UNIT-2 : Data: Spatial and Non-Spatial Data Spatial Data: Points, Lines, Polygons/Area and Surface - Non-Spatial Data - Scales/Levels of Measurement. Data Base: Data sources, Data Base Structure models.	[07 Hrs.]
UNIT-3 : Data acquisition: Vector Data Models, Raster data model, Data Compression, arc-node data structure - Raster to vector conversion - Topology and spatial relationships - Data storage verification and editing.	[07 Hrs.]
UNIT-4 : Coordinate systems, Datums- Map projections - Coordinate transformation, Georeferencing, Digitization- Methods of digitization, Common errors in digitization.	[06 Hrs.]
UNIT-5 : Discrete and continuous surfaces- Digital elevation models, sources of DEM, TIN structure, Extraction of topographic parameters: slope, aspect, delineation of watershed and drainage network - DEM applications.	[06 Hrs.]
UNIT-6 : Operations in GIS - Overlay, Buffers, Spatial analysis, Network analysis, Application of GIS to various natural resources mapping and monitoring and other civil engineering related problems.	[07 Hrs.]

Text Books :

1. Lo C.P. and Yeung
2. A.K.W., Concepts and Techniques of Geographic Information Systems, Prentice-Hall, Inc., NJ, 2002.
3. An Introduction to Geographical Information Systems (4th Edition) by Ian Heywood, Sarah Cornelius and Steve Carver, 2012
4. Burrough, P.A. and McDonnell, R.A. (1998) Principles of Geographical Information Systems. Oxford University Press, Oxford.
5. Introduction to Geographic Information Systems by Chang Kang-tsung (Karl), 2006
6. Geographic Information Systems: An Introduction by Tor Bernhardsen, 2005

Reference Books :

1. M. Anji Reddy BS Publications Remote Sensing and Geographical Information Systems Third Edition
2. Geographic Information System and Environment Modeling Keith C. Clerk, Bradely O Parks, Michel P Crane Pritince Hall of India 2002.

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CIVIL ENGINEERING

V Semester

CV2333 – OE-I : Introduction To Environmental Management

COURSE OBJECTIVES	COURSE OUTCOME
Students will be introduced to 1. Various analysis tools of environmental management 2. Role of impact assessment studies in environmental management 3. Importance of environmental legislations and audit 4. Natural resources, challenges & prospects for sustainable development.	Students will be able to 1. Explain the importance of environmental management tools. 2. Illustrate the procedures impact assessment studies in environmental management 3. Explain environmental legislations and policies for environmental resources. 4. Explain the need of resource management and its challenges for sustainable development.
Mapped Program Outcomes : 6, 7, 8, 9, 10, 12	

UNIT-1 : Introduction to Environmental Management: Quality of life, Objectives and components of Environmental Management, Environmental Management in Socio-economic context. Development and Environmental for Sustainable Development.	[06 Hrs.]
UNIT-2 : Introduction to Environmental Impact Assessment: Role and Status of EIA in India EIA Procedures, Environmental Impact Statement, Methodologies of EIA.	[07 Hrs.]
UNIT-3 : MoEF questionnaire for environmental clearance, critical environmental issues and formulation of strategies of EMP, environmental management plan, development of action plans for critical environmental education programmers. ISO 14001	[07 Hrs.]
UNIT-4 : Environmental Laws and legislation –various enactment and their provisions, Role of State & Central boards of pollution control, Cleaner Technology of production.	[07 Hrs.]
UNIT-5 : Environmental Audit- Concept of EA, procedural aspects of conducting environmental audit, EMS. Introduction to life cycle assessment	[06 Hrs.]
UNIT-6 : Resource Management: depletion of resources – causes & effects, resource utilization, optimal use of resources.	[06 Hrs.]

Text Books :

1. Anand Bal, An Introduction to Environmental Management, Himalaya Publishing House.,2009
2. John Rau & Wooten, Environmental Impact Assessment, Mc Graw Hill.
3. Larry Canter, Environmental Impact Assessment, McGraw Hill.
4. Harry W. Gehm, Jacob I. Bregman, handbook on pollution Control Acts, Central Pollution Control Board, New Delhi.
5. R.K. Sapra, S. Bhardwaj, the New Environmental Age, Ashish Pub. House, New Delhi.

References Books :

1. Rosencranz, S. Divan, M.L. Nobal, Environmental Law and Policy in India, Cases, Materials And Statutes, Tripathi Pvt. Ltd. Bombay.

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BE SoE and Syllabus 2018

(Revised Scheme of Examination w.e.f. 2021-22 onward)

CIVIL ENGINEERING

VII Semester

CV2424 - PE-IV : Wastewater Treatment

COURSE OBJECTIVES	COURSE OUTCOME
Create student's ability to- <ol style="list-style-type: none">1. Understand necessity and objectives of wastewater treatment and layout of a wastewater treatment plant.2. Understand disposal methods for wastewater.3. Know principles of working and design of various waste water treatment units and processes.4. Understand need & processes of Advance wastewater treatment.5. Describe characteristics and treatment of wastewater from various industries.	Students will be able to- <ol style="list-style-type: none">1. Understand wastewater characteristics its disposal methods.2. Design various treatment units for waste water3. Understand advanced treatment processes for waste water4. Understand characteristics and treatment of waste water from various industries.

Mapped Program Outcomes : 1,2,3



UNIT-1 : Holistic approach to Wastewater management, Effluent & Stream standards, wastewater characteristics and their significance, disposal methods for wastewater on land and in water and its impact, self-purification of streams	[06 Hrs.]
UNIT-2 : Preliminary and primary treatment processes and units: Screens, grit chamber and primary settling tank- Principles, types & designs.	[07 Hrs.]
UNIT-3 : Secondary treatment processes & units: Concepts in biological treatment, bacterial growth, Activated sludge process, Trickling filter- Principles, types. Simple design problems / exercise.	[07 Hrs.]
UNIT-4 : Other biological treatment units: Aerated lagoons, Stabilization Ponds, Up flow Sludge Blanket Reactors, Sludge Digester.	[06 Hrs.]
UNIT-5 : Need of advanced treatment, removal of trace organics, micro screening and control of nutrients, nitrification and de- nitrification, removal of phosphorus.	[07 Hrs.]
UNIT-6 : Treatment alternatives for Industrial waste, volume reduction, strength reduction, equalization tank, neutralization tank, Specific industrial wastewater treatment for paper and pulp industry, sugar industry, distillery industry, dairy industry, textile industry.	[06 Hrs.]

Text Books :

1. B.C. Punmia, 2010, Wastewater engineering, Laxmi Publications (P) Ltd., New Delhi.
2. P. N. Modi, 2008, Sewage Treatment & Disposal and Waste Water Engineering, Standard Book House.
3. S. K. Garg, 2010, Environmental Engineering (Volume-2), Khanna Publication.
4. M. N. Rao, 2007, Waste water treatment, oxford and IBH publishing.
5. Patwardhan, 2008, Industrial wastewater Treatment, PHI learning Pvt. Ltd.
6. G.L. Karia and R. A. Christian, 2006, Wastewater Treatment, PHI learning Pvt. Ltd.

Reference Books :

1. Metcalf and Eddy, 2006, Wastewater Treatment Disposal and reuse, Tata McGraw Hill publishing company Ltd.

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B.Tech SoE and Syllabus 2020

(Revised Scheme of Examination w.e.f. 2020-21 onward)

Electronics Engineering

**SoE No.
EE-202.1**

V Semester

EE2302 – Lab: Digital Signal Processing

Expt. No.	Name of Experiment
1	Sampling and reconstruction of signal using MATLAB
2	To generate and plot discrete time signals.
3	To perform operations on discrete time signals.
4	To compute convolution on discrete time signals.
5	To compute DFT and IDFT of discrete time signals.
6	To determine pole zero plot and inverse Z transform of a signal.
7	To design FIR and IIR filter using FDA Tool.
8	To illustrate signal processing application using SP Tool.
9	To perform upsampling and downsampling on discrete time signal.
10	To study of DSP Starter Kit (TMS 320C6XX DSK).

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Electronics Engineering

**SoE No.
EE-202.1**

V Semester

EE2303 –Analog Integrated Circuits & Its Applications

Objective	Course Outcome
1. The objective of this course is to analyze and design a wide variety of operational amplifier / integrated circuits based applications and to have a firm grasp of basic principle of these to adapt to a changing technology as the new devices appear in the market	On completion of this course, 1. Student will acquire knowledge of the fundamentals, the different Parameters and internal structure of the operational amplifier. 2. Student will analyze and design the linear applications of the operational amplifier. 3. Students will analyze and design active Butterworth filters using operational amplifier 4. Student will analyze and design the non-linear applications of the operational amplifier.

CO	Statement	Mapped PO												PSO	
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	Student will acquire knowledge of the fundamentals, the different Parameters and internal structure of the operational amplifier.	3													
CO 2	Student will analyze and design the linear applications of the operational amplifier.	2	3	3										2	
CO 3	Students will analyze and design active Butterworth filters using operational amplifier	1	3	3										2	
CO 4	Student will analyze and design the non-linear applications of the operational amplifier.	1	2	3										2	

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B.Tech SoE and Syllabus 2020

(Revised Scheme of Examination w.e.f. 2020-21 onward)

Electronics Engineering

**SoE No.
EE-202.1**

V Semester

EE2311 – PE I: Computer Communication Network

Objective	Course Outcome
1. To learn basics of data communication, wireless transmission, spread spectrum, medium access control- FDMA, TDMA & CDMA. 2. To study TCP/IP, ARP, RARP, UDP protocols & addressing. 3. To study network security & its applications.	On completion of this course, Students will be able to 1. Describe various protocols, models in Computer Networks 2. Compare Connectors, Network hardware, Media Types (cables, Wireless) 3. Design, implement and analyze simple computer networks. 4. Apply the different strategies and Operations of TCP/UDP, FTP, HTTP protocols

CO	Statement	Mapped PO												PSO	
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS O1	PS O2
CO 1	Describe various protocols, models in Computer Networks	2	2												
CO 2	Compare Connectors, Network hardware, Media Types (cables, Wireless)	2	2												
CO 3	Design, implement and analyze simple computer networks	2	2												
CO 4	Apply the different strategies and Operations of TCP/UDP, FTP, HTTP protocols	2	2												

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Electronics Engineering

SoE No.
EE-202.1

V Semester

EE2311 – PE I: Computer Communication Network

Unit No.	Contents	Max. Hrs.
1	Introduction, network and services: communication network, approaches to network design, types of network, two stage and three stage network. Uses of computer networks, LAN, MAN, WAN, design issues for layers, connection oriented and connectionless services, service primitives, Application and layered architecture, OSI reference model.	8
2	LAN network and medium access layer: LAN structure, random access, multiple access protocols, IEEE standard 802 for LAN and MAN, high speed LANS, repeaters, hubs, bridges, fast Ethernet, Wireless LAN	7
3	Physical layer and data link layer: transmission media, PSTN. Data link layer design issues, error detection and correction methods, elementary data link protocols, sliding window protocols.	8
4	Network layer and transport layer: Network layer design issues, routing, congestion, internetworking, transport layer design issues, transport service primitives, internet transport protocol, TCP/IP architecture, TCP/IP protocol, IP packets, IP addressing, TCP/IP utilities ,wireless TCP and UDP, routers and gateways	7
5	Application layer: Network security cryptography, secrete key, public key, digital signature, domain name system, electronic mail system	8
6	Multimedia, real time transport protocol, e-mail security, web security, communication security, electronic mail, world wide web.	7

Text Books

SN	Title	Edition	Authors	Publisher
1	Computer Networks	3 rd Edition,1996	Tanenbaum	Prentice Hall
2	Data Communications and Networking	4 th edition, 2007	Behrouz a Forouzan	Tata Mc. Graw Hill

Reference Books

SN	Title	Edition	Authors	Publisher
1	Data and Computer Communication	8th Edition,2006	W. Stallings	Prentice Hall
2	Telecommunication switching systems and networks	2004.	T. Vishwanathan	Prentice Hall

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Electronics Engineering

SoE No.
EE-202.1

V Semester

EE2314 – Lab: PE I: Embedded Systems

Expt. No.	Name of Experiment (Any Ten)
1	To swap data byte
2	To perform addition, subtraction of 16 bit number
3	To find larger of a two numbers.
4	To perform factorial of a given number
5	To perform ON/OFF LED and show status of LED on LCD
6	To display number from 0 to 9 on seven segment display.
7	To ON/OFF LED using Switch.
8	To rotate a stepper motor in clockwise & anti-clock wise direction with equal delay.
9	Perform experiment on DAC of LPC2103
10	ADC and display value on LCD.
11	To find 1's complements of a given number.
12	Study of RTOS
13	device driver for UART.
14	Modify scheduler in such a way that it will assign highest priority to keypad.
15	values from RTC and display on LCD.
16	SMS to any mobile number.
17	Interface pen drive for writing predefined file.

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Electronics Engineering

SoE No.
EE-202.1

V Semester

EE2331 – OE I: Fuzzy Logic & Neural Network

Unit No.	Contents	Max. Hrs.
1	Crisp sets: An overview, Fuzzy sets: Basic types, basic concepts, basic properties of α -cuts, representation of fuzzy sets, and extension principle of fuzzy sets	8
2	Operations on fuzzy sets, Fuzzy numbers, Arithmetic operations on intervals, arithmetic operations on fuzzy numbers, fuzzy equations	7
3	Fuzzy controllers: an overview with applications, applications of fuzzy logic	7
4	Fundamental concepts of ANN: Basic building blocks of artificial neural networks, network architectures, activation functions, McCulloch-Pitt's neuron model, Learning rules: Hebbian learning rule, Perceptron learning rule, Delta learning (Widrow- Hoff and LMS)rule, Competitive learning rule, Boltzmann learning	8
5	Brief introduction to single layer and multilayer perceptions, ADALINE and MADALINE, feed-forward networks, back propagation networks and applications.	8
6	Radial basis function network, Self organizing feature map and applications	7

Text Books				
SN	Title	Edition	Authors	Publisher
1	Fuzzy sets and Fuzzy logic	2008	George J. Klir and Bo Yuan	Prentice Hall
2	Neural Networks: A comprehensive Foundation'	2 nd Edition, 2005	Simon Haykin	Pearson publications

Reference Books				
SN	Title	Edition	Authors	Publisher
1	Fuzzy sets: Uncertainty & information	1988	Klir and Folger	PHI
2	Introduction of Artificial Neural Networks	1999	Jacek Zurada	Pws Pub Co
3	Fuzzy Logic with engineering applications,	3rd Edition	Timothy Ross,	Wiley Publication
4	Principles of Soft Computing	2nd Edition	S. N. Sivanandanam and S. N. Deepa,	Wiley Publication

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Electronics Engineering

SoE No.
EE-202.1

V Semester

EE2332 – OE I: Basics of Analog and Digital Communication Systems

Objective	Course Outcome
<ol style="list-style-type: none">To Study different analog and digital modulation techniques.To understand transmitter & receivers in communication systems	<p>On completion of this course, Students will be able to</p> <ol style="list-style-type: none">Understand different modulation and demodulation schemes for analog communication with the concept of noiseUnderstand different pulse analog and digital modulation techniques.Understand different digital modulation schemesUnderstand the different coding techniques for communication systems.

CO	Statement	Mapped PO												PSO	
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS 01	PS 02
CO 1	Understand different modulation and demodulation schemes for analog communication with the concept of noise	2	1												
CO 2	Understand different pulse analog and digital modulation techniques.	2	1												
CO 3	Understand different digital modulation schemes	2	1												
CO 4	Understand the different coding techniques for communication systems	2	1												

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Electronics & Telecommunication Engineering

SoE No.
ET-201

VI Semester

ET2382- PE II : Lab. Internet of Things (IoT)

Course Learning Objectives	Course Outcomes
Students should be able 1. To understand the physical and Logical design of IoT. 2. To study the M2M and NETCONF. 3. To understand python programming. 4. To understand physical servers and cloud offerings.	Students will be able to 1. Illustrate the physical and Logical design of IoT. 2. Explain the M2M and NETCONF. 3. Develop python programs for IoT applications. 4. Design IoT based systems.

Expt. No.	Name of Experiment
01	Add ten natural numbers in python
02	Experiment on functions in python
03	Experiment on string manipulation in python
04	Interfacing LED with Raspberry pi.
05	Interfacing DHT11 sensor with Raspberry pi.
06	File handling using Python.
07	Reading data from server.
08	Experiment on python Django.
09	Experiment on python Django.
10	Preparing complete IoT system using AWS server
11	Mini-project

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Electronics & Telecommunication Engineering

SoE No.
ET-201

VI Semester

ET2383- PE II : Optical Communication

Course Objectives	Course Outcomes
Students should be able to 1. Learn the principles of step index and graded index optical fiber. 2. Know the types of losses in optical fiber. 3. Understand Transceiver systems in optical communication. 4. Learn concept of active, passive devices and measurements in optical communication.	Students will be able to 1. Elaborate the concepts of optical communication system. 2. Analyze Optical Communication Systems with different types of losses. 3. Select appropriate types of optical fibers and receivers. 4. Elaborate different methods of loss measurements in fiber optics

UNIT I : INTRODUCTION TO OPTICAL FIBERS

Introduction of fiber Optic system. Principle of optical communication-Attributes and structures of various fibers such as step index, graded index mode and multi mode fibers. Propagation in fibers-Ray mode, Numerical aperture and multipath dispersion in step index and graded index fibers structure, Electromagnetic wave equation in step index and graded index fibers ,Modes and Power flow in fibers .

06Hrs

UNIT II : SIGNAL DEGRADATION IN OPTICAL FIBERS

Absorption losses, Scattering losses, Bending Losses, Core and Cladding losses, Signal Distortion in Optical Wave guides Group Delay – Material Dispersion, Wave guide Dispersion, Intermodal dispersion, Pulse Broadening in GI fibers – Mode Coupling

Attenuation –

06Hrs

UNIT III : FIBER OPTICAL SOURCES

Direct and indirect Band gap materials – LED structures – Light source materials – Quantum efficiency and LED power, Modulation of a LED, Laser Diodes – Rate equations – External Quantum efficiency –Laser Diodes structures and radiation patterns – Single Mode lasers – Modulation of Laser Diodes, Fabry Perot cavity Quantum laser

06Hrs

UNIT IV : FIBER OPTICAL RECEIVERS

PIN and APD diodes – Photo detector noise, SNR, Detector Response time, Avalanche Multiplication Noise – Comparison of Photo detectors – Fundamental Receiver Operation – pre-amplifiers - Receiver Configuration- The Quantum Limit .

06Hrs

UNIT V: POWER LAUNCHING AND COUPLING IN DIGITAL TRANSMISSION SYSTEM

Source to fiber power launching –Fiber to Fiber Joints-Fiber Splicing and connectors, Mechanical Misalignment, line coding –error correction- Noise Effects on System Performance , Wavelength division Multiplexing.

06Hrs

UNIT VI: Measurement in optical fibers

Attenuation, Time domain dispersion and Frequency domain dispersion, NA measurement Refractive index profile and optical source characteristic measurements, OTDR, Eye pattern, **New topic to be announced time to time**

06Hrs

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**VI Semester****ET2385- PE II: Principles of image processing**

Course Objective	Course Outcome
Students should be able to 1) Learn the fundamentals of digital image processing algorithms. 2) Learn the algorithms of spatial and frequency domain filtering. 3) Learn segmentation and restoration of digital images through various algorithms 4) Understand the process of image representation and description	Students will be able to 1) Examine the concepts of image enhancement, restoration, segmentation, representation and description. 2) Apply basic image processing algorithms and filtering techniques for image enhancement. 3) Apply the algorithms for image restoration and segmentation 4) Extract the features for image representation and description

UNIT I: Digital Image fundamental

Digital Image fundamental steps and components of an image processing system, elements of visual perception, Image formation and acquisition, Image sampling and quantization, some basic relationship between the pixels, mathematical tools used in digital image processing. **06Hrs**

UNIT II: Intensity Transformation and Histogram Processing

Image Negative, Log Transformation, Power Law transformation, Linear Piecewise transformation, Histogram Equalization, Histogram Specification, Histogram Statistics **06Hrs**

UNIT III: Filtering in spatial and frequency domain

Fundamentals of Spatial Filtering, Smoothing spatial filtering, Sharpening Spatial Filtering, Unsharp masking and High boost filtering, filtering in Frequency Domain: Introduction to Fourier transform and frequency domain, Smoothing frequency domain filters, and sharpening frequency domain filters **06Hrs**

UNIT IV: Image Restoration

Image Restoration Image degradation/restoration process, noise model, restoration in presence of noise, periodic noise reduction, linear, position invariant degradation, estimating degradation function, Inverse filtering, Wiener filtering **06Hrs**

UNIT V : Image Segmentation

Fundamentals, Detection of discontinuities: Point, Line and Edge, Thresholding, Region based segmentation: Region Growing, Split and Merge, Clustering **06Hrs**

UNIT VI : Feature Extraction

Boundary Pre-processing: Chain Code, MPP, Signatures, Skeleton; Boundary Descriptors: Simple Descriptor, Shape Number, Fourier Descriptor, Statistical Moments; Region Feature descriptor: Basic descriptor, Topological Descriptor, Texture Descriptor **06Hrs**

Text books:				
1	Digital Image Processing	2nd edition 2002	R.C. Gonzalez & R.E. Woods	Addison Wesley/Pearson education publication
2	Fundamentals of Digital Image processing	2nd edition.	A. K. Jain	PHI publication
Reference books:				
1	Digital Image processing using MATLAB	2004	R.C. Gonzalez & R.E. Woods	Addison Wesley/Pearson education publication
2	Digital Image processing	3rd Edition 2004	William K. Pratt	John Wiley

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Electronics & Telecommunication Engineering

SoE No.
ET-201

VI Semester

ET2386- PE II: Lab. Principles of image processing

Course Objective	Course Outcome
Students should be able to 1) Learn the fundamentals of digital image processing algorithms. 2) Learn the algorithms of spatial and frequency domain filtering. 3) Learn segmentation and restoration of digital images through various algorithms 4) Understand the process of image representation and description	Students will be able to 1) Examine the concepts of image enhancement, restoration, segmentation, representation and description. 2) Apply basic image processing algorithms and filtering techniques for image enhancement. 3) Apply the algorithms for image restoration and segmentation 4) Extract the features for image representation and description

Sr. No.	Experiments are based on
1	Basic Operations on Digital Images
2	Image enhancement using Gray level Transformation
3	Image Enhancement Using Piecewise linear transformation
4	Image Enhancement Using Histogram Processing
5	Spatial Domain Filtering Techniques for Image Enhancement
6	Frequency Domain Filtering Techniques for Image Enhancement
7	Noise modeling and Basic Restoration Techniques
8	Image Segmentation
9	Image Compression
10	Image Representation and Description

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**SoE No.
ET-201**

VI Semester

ET 2397-OE IV: INDUSTRIAL INSTRUMENTATION

Course Learning Objectives	Course Outcomes
<p>The student should be able to</p> <ol style="list-style-type: none"> 1) Study the characteristics of Instruments. 2) Understand the Concepts of Pressure measurements and its calibration process 3) Understand the working principle of various active & passive temperature transducers. 4) Learn the working principle of various flow transducers. 5) Learn the working principle of various transducers like level, thickness speed, ph value etc. 6) Learn automation system components. 	<p>The student will be able to</p> <ol style="list-style-type: none"> 1) Explain instrumentation system 2) Analyze pressure, temperature, parameters measured using transducers 3) Analyze flow, speed and level parameters measured using transducers 4) Elaborate automation system components.

Unit No.	Contents	Max. Hrs.
1	INTRODUCTION Block diagram of instrumentation system, static and dynamic characteristics of instruments, functions of instruments, Definition of Transducers- Role of transducers in instrumentation- Advantages of electrical transducers – Classification of transducers- Analog and Digital, Active and passive, Primary and Secondary transducers- Inverse transducer-Sensitivity and specification for transducers - Characteristics and Choice of transducer-Factors influencing choice of transducer. Need of transducers, Classification, selection criteria. Calibration Process.	6
2	PRESSURE MEASUREMENT Units of pressure - Manometers – Different types – Elastic type pressure gauges – Bourdon type bellows – Diaphragms– Electrical methods – Elastic elements with LVDT and strain gauges – Capacitive type pressure gauge – Piezoresistive pressure sensor –Testing and calibration of pressure gauges – Dead weight tester.	6
3	TEMPERATURE MEASUREMENT 1 Different types of filled in system thermometer , Bimetallic thermometers – Electrical methods of temperature measurement – Signal conditioning of industrial RTDs and their characteristics – Three lead and four lead RTDs.	6
4	TEMPERATURE MEASUREMENT2: THERMOCOUPLES AND PYROMETERS Thermocouples – Laws of thermocouple – Signal conditioning of thermocouples output –cold junction compensation –Response of thermocouple, Radiation methods of temperature measurement – Radiation fundamentals – Total radiation & selective radiation pyrometers – Optical pyrometer – Two color radiation pyrometers.	6
5	FLOWMETERS Variable head type flow meters: – Orifice plate – Venturi tube – Pitot tube. Area flow meter: – Rotameter, Principle and constructional details of electromagnetic flow meter – Ultrasonic flowmeters flow measurements for gases	6
6	MISCELLANEOUS MEASUREMENT Electrical level gauge: – Resistive , Ultrasonic type, Radar type ,Speed measurement -D.C and A.C Tacho generators ,rotary encoder, Proximity sensors- Inductive and capacitive, Introduction to PLC, SCADA. New topic to be announced time to time	6

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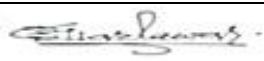
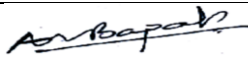
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ET-201

VI Semester

ET 2397-OE IV: INDUSTRIAL INSTRUMENTATION

Text Books				
SN	Title	Edition	Authors	Publisher
1	Industrial Instrumentation and Control	2003	S.K. Singh	Tata McGraw Hill, 2003.
2	Transducers and Instrumentation		D V S Murthy	prentice Hall of India Pvt. Ltd., New Delhi
3	Electrical and Electronic Measurements AND Instrumentation		A. K. Sawhney	Dhanpat Rai &Co

Reference Books				
SN	Title	Edition	Authors	Publisher
1	Principles of Industrial Instrumentation		D. Patranabis T	McGraw Hill Publishing Company Ltd, 1996.
2	Programming for Industrial Automation		Kevin Collins	
3	Instrumentation Measurement & Analysis	2004.	B.C. Nakra & K.K.Chaudary	Tata McGraw Hill Publishing Ltd
4	Measurement Systems – Application and Design	2003	E.O. Doebelin	Tata McGraw Hill publishing company
5	Industrial Instrumentation		D.P. Eckman	Wiley Eastern Ltd.

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Electronics & Telecommunication Engineering

SoE No.
ET-201

VI Semester

ET2400–OE IV: PLCs and SCADA

Course Learning Objectives	Course Outcomes
Students should be able to 1) Understand the fundamentals of Automation and their applications, systems used in industry such as PLC, Memory devices, Input /Output system and Relays. 2) Learn PLC and SCADA programs for industrial automation. 3) Understand the concepts of HMI & SCADA 4) Understand the concepts in distributed control systems	Students will be able to 1) Explain the basic building blocks of Programmable logic controller 2) Develop PLC and SCADA programs for industrial automation. 3) Illustrate the concepts involved in HMI & SCADA 4) Elaborate the concepts in distributed control systems

Unit No.	Contents	Max. Hrs.
1	Introduction to Programmable Controllers Definition, A Historical Background, Principles of Operation, PLCs Versus Other Types of Controls, PLC Product Application Ranges, Advantages of PLCs, PLC Sizes and Scopes of Applications, Overview of PLC System	6
2	Introduction to Programming Languages Types of PLC Languages, Ladder Diagram Format, Ladder Relay Instructions, Ladder Relay Programming, IEC 1131-3 Programming Languages – FBD/ST/IL/SFC Programming Instructions NO-NC & coil based instructions (Relay based Instructions), Timers, Counters, Compare, Mathematics, Jump and Subroutines	6
3	Introduction to SCADA Introduction and brief history of SCADA, Fundamental principles of modern SCADA systems, the components of a SCADA system, Types of SCADA SCADA Programming Graphics Building & Simulation, Tag types & Management, Tools, Programming techniques, Alarms & Trends Configuration, Screen Navigation	6
4	Introduction to HMI FOUNDATIONS OF HMI: The Human: History of User Interface Designing, Types, Features, General architecture, Conventional & current HMI systems, Difference between HMI & SCADA, HMI Hardware interfaces, Practical uses in Industries.	6
5	Data comparison instructions & PLC sequencers Data comparison instructions such as EQU, LES, and GRT, Introduction to the principles of Data Transfer, Move Instruction, Introduction to Shift Registers & Its types. Purpose and application of PLC Sequencers, Masking techniques and the various types of Sequencers, SQO and SQC instructions.	6
6	Distributed Control System: Overview of DCS, DCS software configuration, DCS communication, DCS Supervisory Computer Tasks, DCS integration with PLC and Computers, Features of DCS, Advantages of DCS.	6

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MECHANICAL ENGINEERING

**SoE No.
ME-202.1**

V Semester

ME2305 - PRODUCTION MANAGEMENT

Objective	Course Outcome
The course aims to develop an insight into working of production systems, their evaluation analysis and control. The overall objective is to learn to plan, design, execute or operate, control and measure the efficiency/effectiveness of production systems.	Students will have i) Ability to estimate and evaluate manage production system using work study. ii) Ability to design and evaluate plant layouts. iii) Ability to predict and evaluate future demand using forecasting. iv) Ability to estimate production costing and apply by judging production planning and control.

Unit No.	Contents	Max. Hrs.
1	Work Study: Productivity, factors affecting productivity. Measurement of productivity. Work study and methods study: Definitions, objectives, steps in method study, Process charts, string diagram, motion study, micro motion study, SIMO Chart	7
2	Work measurement: Objectives, definition, stop watch study, work sampling, PMTs, MTM & Work factor method Value analysis and value Engineering: Introduction, steps involved in value analysis. Applications in Manufacturing.	8
3	Plant Layout: Types of Plant Layout, Layout Functions and problems, Organization, Automated material handling, Concepts of AGVs, AS/RS and other automated devices. Design of integrated plant layout for product handling system.	8
4	Forecasting: Need for forecasting, classification of forecasting methods, like judgmental technique, time series analysis, least square method, moving average method, exponential smoothing method.	7
5	Production planning and control: Definition, objectives of PPC, functions of PPC, types of production, Inventory control, EOQ, Techniques in inventory control and associated problems.	7
6	Process analysis and Cost Estimation: Steps involved in manual production planning, Selection of process, analysis. Aims of Cost Estimation, Difference between cost and Estimation, Elements of cost: material, Product cost, Analysis of overhead expenses, Product cost estimation.	8

Text Books

SN	Title	Edition	Authors	Publisher
1	Introduction to Work study	4 th Edition (1992)	George Kanawaty	ILO
2	Motion and Time study	1 st Edition (1980)	Barnes	Wiley
3	Ergonomics	1st Edition (1985)	Murell	Chapman & Hall
4	Production Planning and Control	2nd Edition (2006)	Jain & Agrawal	McGraw-Hill
5	Industrial Engg. And Project management	2 nd Edition (2006)	Mart and Telsang	S. Chand
6	Plant layout and Material Handling	1st Edition (1977)	James Apple	Wiley, Technology & Engineering

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MECHANICAL ENGINEERING

**SoE No.
ME-202.1**

V Semester

OE-II : ME2344- PROJECT EVALUATION & MANAGEMENT

Objective	Course Outcome
The course focuses on developing complete understanding of formulating a problem/project and finding possible solutions against the given constraints. The overall learning shall resolve project identification evaluating its technical and economic feasibility and developing skills for its planning, and establishing controls. Relevant techniques, writing skills and monitoring methods shall be dealt with in details.	<p>The students will be able</p> <ol style="list-style-type: none"> 1) To apply the concepts of monitoring and evaluation, appraise 2) To analyse the best monitoring methods, appreciate evaluation in the context of developmental project work 3) To perform problem analysis, determine relevant indicators and data necessary for evaluation, 4) Implement a monitoring and evaluation process, establish baselines and targets..

Unit No.	Contents	Max. Hrs.
1	Project Identification considering objectives and SWOT analysis, Screening of Project Ideas, Technical, Market, Financial, Socioeconomic and Ecological Appraisal of a project demand forecasting, secondary data, accuracy, confidence level, uncertainty	7
2	Technical feasibility: Process selection, Level of automation, plant capacity, acquiring technology, Appropriate technology plant location, Equipment selection & procurement, Govt. policies. Value analysis and project evaluation:	7
3	Economic feasibility: Cost of Project, working capital analysis, fixed cost, means of finance, estimation of sales & production price analysis, Breakeven point, Projected cash flow statements, projected balance sheet, projected profit & loss statement, projected cash flow, rate of return, Discounted payback period, cost benefit analysis, return after taxes.	9
4	Project Planning and Control: Work break down structure and network development. Basic Scheduling, Critical Path and four kinds of floats. Scheduling under probabilistic durations, Time Cost tradeoffs, CPM, PERT, Optimum project duration, resource allocation, updating	7
5	Project report: Preparation of project report, risk analysis, sensitivity analysis, methods of raising capital	7
6	Initial review, performance analysis, ratio analysis, sickness, project revival, Project Monitoring with PERT/Cost, Organizational aspects, Computer packages and Project Completion environmental & social aspects.	8

Text Books				
SN	Title	Edition	Authors	Publisher
1	Projects	7 th Edition 2007	Prasanna chandra	Tata mc graw Hill publishing company Ltd.
2	CPM & PERT		L. S. Srinath	East West publisher
3	Projects	1963	P.K. Joy	Macmillon
4	Engineering Economy	5 th edition	H. G Thuesen, W J Fabricky, G,J, Thuersen	Prentice-Hall
5	Finance series 'Project management', Vol-I and Vol-III	2009	ICFAI	ICFAI, Press Hyderabad
6	Finance Management	6 th Edition 2010	M.Y.Khan	Tata McGraw hill
7	Financial Management	4 th Edition	Chandra, Prasanna	Tata McGraw-Hill Education, 1997
8	Engineering Economics	8 th Edition	G. J. Thuesen, Wolter J. Fabrycky	Prentice Hall, 1993

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**Yeshwantrao Chavan College of Engineering**

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B. Tech SoE and Syllabus 2020

(Revised Scheme of Examination w.e.f. 2020-21 onward)

MECHANICAL ENGINEERINGSoE No.
ME-202.1**VI Semester****OE-IV : ME2394 – Project Evaluation & Management**

Objective	Course Outcome
The course focuses on developing complete understanding of formulating a problem/project and finding possible solutions against the given constraints. The overall learning shall resolve project identification evaluating its technical and economic feasibility and developing skills for its planning, and establishing controls. Relevant techniques, writing skills and monitoring methods shall be dealt with in details.	The students will be able 1. To apply the concepts of monitoring and evaluation, appraise 2. To analyse the best monitoring methods, appreciate evaluation in the context of developmental project work 3. to perform problem analysis, determine relevant indicators and data necessary for evaluation, 4. Implement a monitoring and evaluation process, establish baselines and targets..

Unit No.	Contents	Max. Hrs.
1	Project Identification considering objectives and SWOT analysis, Screening of Project Ideas, Technical, Market, Financial, Socioeconomic and Ecological Appraisal of a project demand forecasting, secondary data, accuracy, confidence level, uncertainty	7
2	Technical feasibility: Process selection, Level of automation, plant capacity, acquiring technology, Appropriate technology plant location, Equipment selection & procurement, Govt. policies. Value analysis and project evaluation:	7
3	Economic feasibility: Cost of Project, working capital analysis, fixed cost, means of finance, estimation of sales & production price analysis, Breakeven point, Projected cash flow statements, projected balance sheet, projected profit & loss statement, projected cash flow, rate of return, Discounted payback period, cost benefit analysis, return after taxes.	9
4	Project Planning and Control: Work break down structure and network development. Basic Scheduling, Critical Path and four kinds of floats. Scheduling under probabilistic durations, Time Cost tradeoffs, CPM, PERT, Optimum project duration, resource allocation, updating	7
5	Project report: Preparation of project report, risk analysis, sensitivity analysis, methods of raising capital	7
6	Initial review, performance analysis, ratio analysis, sickness, project revival, Project Monitoring with PERT/Cost, Organizational aspects, Computer packages and Project Completion environ-mental & social aspects.	8

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Nagar Yuwak Shikshan Sanstha's

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BE SoE and Syllabus 2018

(Revised Scheme of Examination w.e.f. 2021-22 onward)

MECHANICAL ENGINEERING

VII Semester

ME2445– PE IV : Finance & Cost Management

Objective	Course Outcome
<ul style="list-style-type: none">•To develop in the engineering students the ability to analyze any engineering problem in a simple and logical manner and to apply a few well understood basic principles of Management to find its solution.•To be able to take a proper decision at proper time which will be beneficial in future.	<ul style="list-style-type: none">(I) The student will have ability to evaluate the cost of the product(II) The student will have the ability to Analyze the financial requirement.(III) The student will have improved Decision making ability.(IV) The student will have ability to take a proper decision on waste or scrap material.

Unit 1 Business Finance: Need for finance, sources of finance (fixed and working capital), equity and preference shares, deposits from public, debentures, bonds, term loans, financial institutions in India, Financial statements and their analysis.	[7 Hrs]
Unit 2 Concept of Cost: Concept of cost, classification of cost, direct and indirect , fixed and variable , semi variable, product and period, controllable and uncontrollable costs, opportunity costs , sunk cost, joint cost, prime cost, factory cost, cost of production, selling and distribution cost, administrative cost, cost of sales.	[7 Hrs]
Unit 3 Cost ascertainment and cost reduction: Concept of overhead, collection of overheads, allocation and appointment, absorption of overheads, absorption rates, under – over absorption , cost centers, cost units, cost statement sheet. Areas of cost reduction, techniques, productivity.	[7 Hrs]
Unit 4 Costing System: Job costing, contract costing, cost plus contracts, batch costing, process costing, simple process costing, normal abnormal losses and gains, waste, scrap & spoilage, joint & byproducts, operating costing.	[8 Hrs]
Unit 5 Cost Planning and Control: Concept of budgeting, advantages and limitations, budgetary control, key factors, fixed and flexible budget. Standard costing, selling of standards, variance analysis.	[8 Hrs]
Unit 6 Decision Making:	[8 Hrs]

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MECHANICAL ENGINEERING

Marginal costing, break even analysis, cost volume, profit analysis, application of costing to various decisions like make or buy, add or drop products, cost or process further, operate or shut down, replace or retain.

Reference books:

S.N.	Title of the book	Edition (Year of publication)	Author(s)	Publisher
1	Principles and Practice of Cost Accounting	Fifth edition	N.K.Prasad	Pearson Education
2	Cost Accounting		Jawahar Lal	
3	Management Accountancy	Third edition 2010	J. Batty	Tata Mc Graw Hill
4	Financial Management		Khan and Jain	
5	Financial Management	2007	Prasanna Chandra	Tata Mc Graw Hill
6	Engineering Economy	1973	Paul Degarmo	Macmillan, 1973
7	Cost Accounting	2008	B.K.Bhar	Academic publishers
8	Costing and finance management	2012	Mrunalini Naik	Thakur publications

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MECHANICAL ENGINEERING

VII Semester

ME2464– PE V : Value Engineering

Objective	Course Outcome
To familiarize students with : 1. Philosophy of Value Analysis / Value Engineering , its importance and application 2. The various steps involved in systematic implementation of Value Analysis / Value Engineering	Students will be able to: 1. Explain the various types of Values and functions. 2. Evaluate the product life cycle. 3. Analyze the project selection and estimate life cycle costs. 4. Evaluate and improve value of product/system by designing and critically analyzing the VE job plans and other VE/VA techniques.

Unit 1	[7 hrs]
Introduction to Value Engineering (V.E.) and Value Analysis, Quantitative definition of Value, Use Value and Prestige Value, Estimation of product quality/performance, Types of Functions.	
Unit 2	[7 hrs]
Life Cycle of a Product, Product life cycle Management, Methodology of V.E.,	
Unit 3	[8 hrs]
Relationship between Use Functions and Esteem Functions in product design, Functional Cost and Functional Worth, Effect of value improvement on profitability, Aims of VE systematic Approach	
Unit 4	[8 hrs]
Introduction to V.E. Job plan / Functional Approach to Value Improvement, Various phases and techniques of the job plan	
Unit 5	[8 hrs]
Factors governing project selection, Life Cycle Costing for managing the Total Value, Concepts in LCC, Present Value concept, Annuity concept, Net Present Value, Pay Back period, Internal rate of return on investment (IRR), Examples and illustrations	
Unit 6	[7 hrs]
Creative thinking and creative judgment, False material, labor and overhead saving, System Reliability, Reliability elements in series and parallel, Decision matrix, Estimation of weights and efficiencies, Sensitivity analysis, Utility functions, Fast diagramming, Critical path of functions, DARSIRI method of value analysis, Purchase price analysis.	

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Declaration by the Head of the Institution

I hereby declare that the data, information and support documents attached herewith are genuine and correct to my knowledge.

Dr. U.P. Waghe

Principal

Principal

Yeshwantrao Chavan
College of Engineering
Wanadongri Hingna Road,
NAGPUR-441110

