

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
FREE ELECTIVE –II Syllabus

CV418 / CV810	FE (2) ELEMENTS OF EARTHQUAKE ENGINEERING	L=4	T=0	P=0	CREDITS = 4
----------------------	--	------------	------------	------------	--------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
1) To understand basic concepts of earthquake 2) To understand damages due to earthquake 3) To understand behavior of structures under earthquake loading 4) To understand disaster management and retrofiting	After completion of course the student will be able 1) To be understood the necessity and importance of earthquake engineering. 2) To be understood the provision of IS code used for earthquake resistance design of structure. 3) The codal provision for earthquake resistance design of structures as per Indian standard are explained. 4) The course covers study of damages caused due to past earthquake in & outside India and remedial measures.
Mapped Program Outcomes: a,c,e ,l,m	

UNIT-1:

Introduction to earthquakes:

Geology of earth, configuration of tectonic plates in a globe, behavior of plates, their motion and effects, causes of earthquake and their characteristics, Earthquake parameters, magnitudes, intensity, Seismic waves

[06 hrs.]

UNIT-2:

Analysis and interpretation of earthquake data, determination of magnitude, location of epicenter, focal depth

[06 hrs.]

UNIT-3

Recording earthquakes, seismicity of the world, history of earthquakes in India and abroad, case studies of effects of earthquakes, causes and sources of earthquake damage

[08 hrs.]

UNIT-4:

Non-engineered earthquake resistant structures, load bearing structures, masonry structures, seismic zoning of India (IS 1893:2002 Part I), seismic coefficients for different zones, definitions, irregularities in buildings, consequences of irregularities.

[08 hrs.]

UNIT-5:

Strengthening, rehabilitation and retrofitting of earthquake damaged structures

[06 hrs.]

UNIT-6:

Earthquake disaster management, mitigation and social aspects, lessons from past earthquake: - study of damages caused due to past earthquake in & outside India and remedial measures

[06 hrs.]

Text books:				
SN	Title	Edition	Authors	Publications
1	Design of Earthquake Resistant Structures,	3 rd Printing 2006	Agrawal & Shrikhande,	Ashok K. Ghosh Prentice – Hall of India Pvt. Ltd.

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
FREE ELECTIVE –II Syllabus

CV418 / CV810	FE (2) ELEMENTS OF EARTHQUAKE ENGINEERING	L=4	T=0	P=0	CREDITS = 4
----------------------	--	------------	------------	------------	--------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Reference books:				
SN	Title	Edition	Authors	Publications
1	Seismic Hazard and Risk Analysis.	2004	Robin K. McGuire	Publisher
2	Earthquake Tips	2005	C.V.R. Murty	NICEE, IITK
3	NICEE Guidelines for Earthquake Resistant Non-Engineered Construction	2004	<i>www.nicee.org / iaee / E_FrontCover.pdf</i>	National information center of Earthquake engineering Indian Institute of Technology Kanpur Kanpur 208016, India
4	Geotechnical Earthquake Engineering	1996	S.L. Kramer	Prentice – Hall of India Pvt. Ltd.

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING

FREE ELECTIVE –II Syllabus

CV419 / CV811	FE (2) ELECTIVE – I AIR POLLUTION AND SOLID WASTE MANAGEMENT	L=4	T=0	P=0	CREDITS = 4
----------------------	---	------------	------------	------------	--------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
1) To provide general understanding of air pollution, air pollutants, their sources & their effects 2) To provide knowledge and meteorological parameters of air pollution, air sampling & measurement of pollutants. 3) To provide knowledge of air pollution control equipments, air pollution due to automobiles & general Idea of noise pollution. 4) To provide understanding of solid waste management functional elements.	1) Student will gain an understanding of the type, sources & effect of air pollutants. 2) Will gain the knowledge of parameters affecting air pollution and able to know the various methods of measurement and estimation of pollutants. 3) Will gain knowledge of various air pollution control equipments basic of noise pollution & pollution caused due to automobile exhaust . 4) Will gain in depth understanding of solid waste management.

Mapped Program Outcomes: a,c,e,i,j

UNIT-1:

Introduction to air pollution: Definition, air pollution episodes, atmosphere and its zones, classification and sources of air pollutants, effects of air pollutants on man, plants animal & materials

[09 hrs.]

UNIT-2:

Meteorology and air pollution: Primary and secondary parameters, atmospheric stability, plume behavior, air sampling and measurement: ambient air sampling and stack sampling, collection of particulates and gaseous pollutants, methods of estimation.

[09 hrs.]

UNIT-3

air pollution control methods and equipment: Principle of control methods for particulates and gaseous pollutants, gravity settlers, electrostatic precipitators, bag filters cyclones, wet scrubbers, automobile exhaust: Pollution due to diesel and petrol engines, exhaust treatment and abatement, noise Pollution: Sources, ill effects, control measures.

[09 hrs.]

UNIT-4:

Introduction to solid waste management, sources, quantity and quality: sources of solid waste, classification and components, physical and chemical characteristics, per capita contribution, sampling and analysis.

[09 hrs.]

UNIT-5:

Collection and transportation of solid waste: method of collection, equipment used for collection and transportation, transfer stations, solid waste processing: methods of processing, choice of methods, merits and demerits of various methods.

[09 hrs.]

UNIT-6:

Composition of waste: method of composting, factors affecting composting, sanitary land filling: Site requirements, methods, leachate management, Incineration: Principles of incineration, types of incinerators, advantages and disadvantages.

[09 hrs.]

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING

FREE ELECTIVE –II Syllabus

CV419 / CV811	FE (2) ELECTIVE – I AIR POLLUTION AND SOLID WASTE MANAGEMENT	L=4	T=0	P=0	CREDITS = 4
----------------------	---	------------	------------	------------	--------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Text books:				
SN	Title	Edition	Authors	Publications
1	Air Pollution	01-Jun-1988	M.N. Rao & H.V.N. Rao	Tata McGraw Hill Publishing Co. Ltd
2	Environmental Pollution Control Engineering	01-Jan-2007	C.S. RAO	New Age International, Wiley Estern Ltd. New Delhi.
3	Air pollution	1973 Vol I to X	Stern A. C.	Academic Press
4	Solid Waste Management in Developing countries	1983	A.D. Bhide & Sunderesan B.B.	INSDOC, New Delhi
5	Intgrated Solid Waste Management Engineering Principle and Management Issues	1993	Tohobanoglous	McGraw-Hill
6	Air Pollution	1995	K. V. S. G. Murlikrishna	Kaushal& Company

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING

FREE ELECTIVE –II Syllabus

EL412/EL810	Electrical Energy Audit and Safety	L= 4	T=0	P=0	Credits=4
PO/PSPO – a, b, d, f, h, l, m					

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Learning Objectives	Learning Outcomes
Students will understand the various aspects of energy management audit monitoring and safety.	The student on completion will be able to Understand <ul style="list-style-type: none"> • Energy Scenario • Basics of Energy and its various forms • Energy Management & Audit • Energy Monitoring and Targeting • Global environmental concerns • Electrical Safety

UNIT-1: Energy Scenario

Commercial and Non-commercial energy, primary energy sources, commercial energy production, final energy consumption, energy needs of growing economy, long term energy scenario, energy pricing, energy sector reforms, energy and environment, energy security, energy conservation and its importance. Re-structuring of the energy supply sector, energy strategy for the future, air pollution, climate change. Energy Conservation Act-2001 and its features, Salient Features of Electricity Act 2003.

UNIT-2: Basics of Energy and its various forms

Electricity basics- DC & AC currents, electricity tariff, Thermal Basics-fuels, thermal energy contents of fuel, temperature & pressure, heat capacity, sensible and latent heat, evaporation, condensation, steam, moist air and humidity & heat transfer, units and conversion.

UNIT-3 : Energy Management & Audit

Definition, need and types of energy audit. Energy management (audit) approach-understanding energy costs, bench marking, energy performance, matching energy use to requirement, maximizing system efficiencies, optimizing the input energy requirements, fuel & energy substitution, energy audit instruments.

UNIT-4: Energy Monitoring and Targeting

Defining monitoring & targeting, elements of monitoring & targeting, data and information-analysis, techniques -energy consumption, production, cumulative sum of differences (CUSUM).

UNIT-5 : Global environmental concerns

United Nations Framework Convention on Climate Change (UNFCCC), sustainable development, Kyoto Protocol, Conference of Parties (COP), Clean Development Mechanism (CDM), Prototype Carbon fund (PCF).

UNIT-6: Electrical Safety

Primary hazards associated with electricity. control measures and safety-related work practices to minimize the risk associated with electrical hazards. response procedures in the event of electrical shock or fire.

Text books:				
1	Principles of Energy Conservation	1991	Archie, W Culp	McGraw Hill
2	Energy management handbook	8 th Edition	Wayne C. Turner	John Wiley and Sons
3	Bureau of Energy Efficiency Study material for Energy Managers & Auditors Examination	--	---	Bureau of Energy Efficiency www.beeindia.in
Reference books:				
1	Handbook on Energy Audits and Management		Amit Kumar Tyagi	TERI

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING

FREE ELECTIVE –II Syllabus

EL413/EL811	Utilisation of Electrical Energy	L= 4	T=0	P=0	Credits=4
--------------------	---	-------------	------------	------------	------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Learning Objectives	Learning Outcomes
To understand the basic principle of electrical heating, welding, illumination, refrigeration and air conditioning, fans, pumps, compressors and digi sets.	The student on completion will be able to Understand the application of electrical energy in <ul style="list-style-type: none"> • Electric Heating • Electric Welding • Illumination • Refrigeration & Air conditioning • Fans & Pumps • Compressors and DG Sets

UNIT-1: Electric Heating

- i) Electric Heating : Types and methods of electrical heating, advantages of electrically produced heat, type
- ii) s & application of electric heating equipments, transfer of heat.
- iii) Resistance Ovens : General constructions, design of heating elements, efficiency & losses, radiant heating.
- iv) Induction heating: Core type & core less induction furnace, indirect induction oven, medium and high frequency eddy - current heating.
- v) Dielectric heating: Principle and application.
- vi) Arc furnace : Direct & indirect arc furnace, power supply, characteristics & control.

UNIT-2: Electric Welding:

- i) Importance, Advantages & Disadvantages of welding, classification of welding processes.
- ii) Resistance welding, Butt welding, Spot welding, Projection welding, Seam welding.
- iii) Electric arc welding: carbon arc welding, metal arc welding, submerged arc welding, Stainless Steel welding
- iv) Ultrasonic welding, electron beam welding, laser beam welding.

UNIT-3 : Illumination :

Nature of light, terms used in illumination, solid angle, laws of illumination, polar curves, Colour Rendering Index (CRI), types of lamps, luminaries, Design of illumination systems, indoor lighting systems, factory lighting, outdoor lighting design, flood lighting, street lighting, energy saving in lighting systems.

UNIT-4: Refrigeration & Air conditioning:

Terminology, refrigeration cycle, refrigeration systems (Vapor compression, vapor absorption), domestic refrigerator, water cooler, desert cooler.

Air conditioning: Factors involved in air conditioning, comfort air conditioning, industrial air conditioning, effective temperature, summer / winter air conditioning systems, types of air conditioning systems, room air conditioning, and central air conditioning.

UNIT-5 : Fans & Pumps:

Fans and Blowers: Fan types, fan performance evaluation & efficient system operation, fan design & selection criteria, flow control strategies, fan performance assessment, energy saving opportunities.

Pumps: Pump types, system characteristics. Pump curves, factors affecting pump performance, efficient pumping system operation, flow control strategies, energy conservation opportunities in pumping system.

UNIT-6: Compressors and DG Sets:

Compressors: Compressor types, Compressor efficiency, Compressed air system components.

Diesel Generating Systems: Introduction, selection and installation factors, operational factors, energy performance assessment in DG sets, energy saving measures for DG sets.

Text books:				
1	Utilization of Electric Energy	1 st Edition, 2006	E. Openshaw Taylor	Orient Longman
2	Utilization of Electric Power & Electric Traction	Edition, 2009	J.B. Gupta	Kataria & Sons
3	Art and Science of Utilization of Electrical Energy		H Partap	Dhanpat Rai & Sons, Delhi
4	Utilisation of Electrical power	1 st Edition, 2006	R. K. Rajput	Laxmi Publications Pvt. Ltd.

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
FREE ELECTIVE –II Syllabus

EL413/EL811	Utilisation of Electrical Energy	L= 4	T=0	P=0	Credits=4
--------------------	---	-------------	------------	------------	------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Reference books:						
1	Guide book for National Certification Examination for Energy Managers and Energy Auditors					Bureau of Energy Efficiency
2	Utilization of Electrical Power			Dr N. V. Suryanarayana		Wiley Eastern Ltd, New Age International

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
FREE ELECTIVE –II Syllabus

ET411	Soft computing	L= 4	T = 0	P = 0	Credits = 4
--------------	-----------------------	------	-------	-------	-------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Course Objectives

1. To familiarize with soft computing concepts.
2. To describe the basics of Soft computing and its application areas particularly to intelligent systems
3. To introduce the ideas of Neural networks.
4. To introduce the concepts of Fuzzy Logic.
5. To introduce the concepts of Genetic algorithm

UNIT-1:

Introduction of Soft Computing Methods, Fundamentals of Genetic Algorithms, Encoding, Fitness function, Genetic modeling, Applications of GA

06 Hrs

UNIT-2:

Introduction of neural networks, learning methods, perceptrons, perceptron training algorithm, single layer perceptron, multiplayer perceptron, neural network architectures, ADALINE, MADALINE

07 Hrs

UNIT-3

Adaptive filtering, LMS algorithm, Back propagation algorithm, RBF networks, ART Networks, self-organizing feature maps, Applications of ANN

08 Hrs

UNIT-4:

Overview of Crisp Sets, Concepts of Fuzzy sets, representation of fuzzy sets, extension principle, fuzzy compliments, t-norms and t-conforms

07 Hrs

UNIT-5

Fuzzy numbers, arithmetic operation on intervals and on fuzzy sets, lattice of fuzzy numbers, fuzzy equations, fuzzy relations, projections and cylendric extensions, binary fuzzy relations, fuzzy equivalence, compatibility and ordering relations, fuzzy morphism

08 Hrs

UNIT-6:

Fuzzy controllers, Defuzzification Methods , Fuzzy Inference Techniques, applications of fuzzy logic in pattern recognition and image processing

08 Hrs

Text books:				
1	Fuzzy sets and Fuzzy logic	1995	by George Klir, Bo Yuan	PHI
2	Neural Networks, Fuzzy logic and Genetic Algorithms, Synthesis and applications	2003	By S. Rajsekharan, Vijayalaxmi Pai	PHI
3	Elements of Artificial Neural Network	1997	K. Mehrotra	MIT Cognet

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING

FREE ELECTIVE –II Syllabus

ET412	INDUSTRIAL INSTRUMENTATION			L= 4	T = 0	P = 0	Credits = 4
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total		ESE Duration
	15	15	10	60	100		3 Hrs

Course Objectives

To learn various techniques used for the measurement of industrial parameters. To learn pressure transducers, temperature standards, calibration and signal conditioning used in RTD's, thermocouples and pyrometry techniques, load cells, torque meter and various velocity pick-ups.

UNIT-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,

07 Hrs

UNIT-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 – Piezo resistive pressure sensor –Testing and calibration of pressure gauges – Dead weight tester.

08 Hrs

UNIT-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.

07 Hrs

UNIT-4:

TEMPERATURE MEASUREMENT:2

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.

08 Hrs

UNIT-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 flow meters, flow measurements for gases

08 Hrs

UNIT-6:

MISCELLANEOUS MEASUREMENT

Electrical level gauge: – Resistive - capacitive – Nuclear radiation - Ultrasonic type, Radar type ,Speed measurement D.C and A.C tacho generators ,rotary encoder, Proximity sensors- Inductive and capacitive. Soil & water pH measurements.

07 Hrs

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
FREE ELECTIVE –II Syllabus

ME429/ME824	Total Quality Management			L=3	T=1	P=0	Credits=4
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration	
	15	15	10	60	100	3 Hrs	

OBJECTIVES

The course aims to build an overall capability to understand Quality and its relevance in today's dynamic market. Various Quality Improvement tools and technique shall be introduced and practiced so as to develop skills and knowledge to function as a good quality professional in the Engineering Profession.

Unit 1

[7 hrs]

Principles of Quality Management, Pioneers of TQM, Quality costs, Quality system Customer Orientation, Benchmarking, Re-engineering **[d, f, g, h, l, j, m]**

Unit 2

[7 hrs]

Leadership, Organizational Structure, Team Building, Information Systems and Documentation – Quality Auditing, ISO 9000 - QS 9000.QMS, Quality awards. **[c, f, g, h, j, l]**

Unit 3

[8 hrs]

Single Vendor Concept, J.I.T., Quality Function deployment, Quality Circles, KAIZEN, SGA POKA -YOKE, Taguchi Methods. SMED, Kanban system. Cost of quality. Robust design **[d, e, l]**

Unit 4

[8 hrs]

Methods and Philosophy of Statistical Process Control, Control Charts for Variables and Attributes **[a, e, m]**

Unit 5

[8 hrs]

Cumulative sum and exponentially weighted moving average control charts, Others SPC Techniques – Process Capability Analysis. Acceptance Sampling Problem, Single Sampling Plans for attributes, double, multiple and sequential sampling, **[b, c, m]**

Unit 6

[7 hrs]

Six sigma manufacturing concepts. Six-sigma philosophy Quality strategy and policy. Motivation and leadership theories. Continuous vs. breakthrough improvements. Management of change, DMAIC Methodology. Lean manufacturing **[b, h, k, l]**

.Reference books:				
S.N.	Title of the book	Edition (Year of publication)	Author(s)	Publisher
1	Total Quality Management for Engineers	1991	Mohamed Zairi	Woodhead Publishing Limited 1991
2	Production and Operations mangament - Total Quality and Responsiveness	1995	Harvid Noori and Russel	McGraw-Hill Inc, 1995
3	Managing for Total Quality	1998	N.Logothesis	Prentice Hall of India Pvt .Ltd,1998
4	The Essence of Total Quality Management	1995	John Bank	Prentice Hall of India Pvt.Ltd., 1995.
5	Introduction to Statistical Quality Control	1991	Douglus C. Montgomery	2nd Edition, John Wiley and Sons, 1991.
6	Statistical Quality Control	1984	Grant E.L and Leavensworth	McGraw-Hill, 1984.

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING

FREE ELECTIVE –II Syllabus

Regular: - 7th Semester Free Elective-II Theory PTDC: - 7th Semester

ME430/ME825	Reliability Engineering	L=4	T=0	P=0	Credits=4
--------------------	--------------------------------	------------	------------	------------	------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES

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 to find its solution.

Unit 1

[7hrs]

Fundamental concepts:-

Reliability definitions, failure, Failure density, Failure Rate, Hazard Rate, Mean Time To Failure, MTBF, maintainability, availability, safety and reliability, Quality, cost and system effectiveness, Life characteristic phases, modes of failure, Quality and reliability assurance rules, product liability, Importance of Reliability, [a, c, d, e, f, g, h, i, j, l,]

Unit 2

[8hrs]

Probability theory:-

Set theory, laws of probability, total probability theorem, probability distributions, parameters and applications.

[a, c, d, e, f, g, h, i, j, l,]

Unit 3

[7hrs]

System reliability and modeling:

Series and parallel components, mixed configuration, complex systems. Redundancy, element redundancy, unit redundancy, standby redundancy. Types of stand by redundancy, parallel components. Markov models for reliability estimation. [a, c, d, e, f, g, h, i, j, l,]

Unit 4

[8hrs]

Maintainability and Availability:

Objectives of maintenance, types of maintenance, Maintainability, factors affecting maintainability, system down time. Availability - Inherent, Achieved and Operational availability, reliability and maintainability trade-off. Markov models for availability estimation. [a, c, d, e, f, g, h, i, j, l,]

Unit 5

[7hrs]

System reliability Analysis:

Reliability allocation or apportionment. Reliability apportionment techniques. Reliability block diagrams and models.

Reliability predictions. Life testing and accelerated testing. [a, c, d, e, f, g, h, i, j, l,]

Unit 6

[8hrs]

Strength based reliability:

Safety factor, safety margin, Stress strength interaction, Failure Mode, Effects and Criticality Analysis-, , FMECA examples, Ishikawa diagram .fault tree construction, basic symbols development of functional reliability block diagram, Fault tree analysis, fault tree evaluation techniques, Design of Mechanical components and systems:-Material strengths and loads. [a, c, d, e, f, g, h, i, j, l,]

..Reference books:

S.N.	Title of the book	Edition (Year of publication)	Author(s)	Publisher
1	Concepts of Reliability Engg	1985	L.S. Srinath	Affiliated East-West Press (P) Ltd
2	Reliability Engineering	1983	A.K. Govil	Tata McGraw-Hill Publishing Co. Ltd
3	Reliability Engineering	1984	E. Balagurusmy	Tata McGraw-Hill Publishing Co. Ltd
4	Engineering Reliability	1980	B.S. Dhillon, C. Singh	John Wiley & Sons
5	Probabilistic, Reliability	1968	M.L. Shooman	McGraw-Hill Book Co.,
6	Practical Reliability Engg	1985	Patric D.T.O'connor	Heyden and sons ltd.
7	Reliability in Engineering Design	1977	K.C. Kapur, L.R. Lamberson	John-Wiley and sons.
8	Reliability Engineering, Theory and Practice	Third Edition, 1999	A.Birolini	Springer,

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
FREE ELECTIVE –II Syllabus

EE411 / EE803	Fuzzy Logic & Neural Network	L= 4	T = 0	P = 0	Credits = 4
----------------------	---	------	-------	-------	-------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objectives	Outcomes
<ul style="list-style-type: none"> ➤ To make the students well acquainted with Soft computing techniques, especially Fuzzy logic, Neural networks and Genetic algorithm. ➤ To make the students able to identify the complex problems in conventional structures, obtain intelligent acceptable solutions for these problems using soft computing techniques and take the necessary corrective action in the light of ongoing events. 	<ul style="list-style-type: none"> ➤ Students are well acquainted with Soft computing techniques, especially Fuzzy logic, Neural networks and Genetic algorithm. ➤ Students are able to identify the complex problems in conventional structures especially in fields pattern recognition, communication engineering, and several control operations, obtain intelligent acceptable solutions for these problems using soft computing techniques. ➤ Students are able to handle uncertainty, unpredictability and vagueness in some of the concepts which are not covered by traditional science and technology by applying concepts of fuzzy logic. ➤ Students are able to introduce intelligence in conventional structure using neural networks. ➤ Students are able to search fast and arrive at some optimized solutions for some problems using concepts of Genetic algorithm. ➤ Students can take the necessary corrective action in the light of ongoing events.
Mapped outcomes: b,c,d,k	

UNIT-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

UNIT-2:

Operations on fuzzy sets, Fuzzy numbers, Arithmetic operations on intervals, arithmetic operations on fuzzy numbers, fuzzy equations

UNIT-3 :

Fuzzy controllers: an overview with applications, applications of fuzzy logic

UNIT-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

UNIT-5

Brief introduction to single layer and multi layer perceptions, ADALINE and MADALINE, Feed forward networks, Back propagation networks and applications.:

UNIT-6:

Radial basis function network, Self organizing feature map and applications

Text books:				
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:				
1	Fuzzy sets: Uncertainty & information	1988	Klir and Folger	PHI
2	Introduction of Artificial Neural Networks	1999	Jacek Zurada	Pws Pub Co
3	Neural Network and Fuzzy Systems	1991	Bart Kosko	PHI
4	Neural network design	2004	Martin Hagan, Howard Demukh, Mark Beale	Thomson learning and Vikas publishing house

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
FREE ELECTIVE –II Syllabus

EE429/ EE825	Basics of Analog and Digital Communication Systems	L= 4	T = 0	P = 0	Credits =4
---------------------	---	------	-------	-------	------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objective <ul style="list-style-type: none"> ➤ To Study of amplitude, frequency & phase modulation. ➤ To learn the concept of PPM, PAM, PWM & PCM & delta modulation. ➤ To understand the operation of digital modulation techniques. 	Outcome <ul style="list-style-type: none"> ➤ Recognize and utilize latest analogue and digital communication technologies. ➤ It will provide fundamental concepts & limits in information theory in the context of digital communication theory. ➤ Graduates will demonstrate different modulation techniques. ➤ Graduate will be able to explain digital modulation techniques for transmitting digital data. ➤ Graduates will be able to describe various types of transmitters & receivers in communication system.
Mapped outcomes: b,c,d,k	

UNIT-1:Basic block diagram of Analog communication system, Modulation techniques: Need for modulation, Basic concepts of AM, FM, PM, Transmitters.

UNIT-2:Receivers: Basic receiver (TRF), Super heterodyne receiver, AM detectors, FM Detectors, Noise Types of Noise, Definition of Noise figure, signal to noise ratio, calculation of noise figure.

UNIT-3:Pulse Modulation: Generation and demodulation of PAM, PWM, PPM, Time division Multiplexing, Frequency division multiplexing.

UNIT-4:Basic digital Modulation System, Channel capacity, PCM, ADPCM, Delta Modulation, ADM.

UNIT-5:Digital Modulation techniques: ASK, FSK, PSK, BPSK,QPSK, MSK, DPSK, BFSK,

UNIT-6: Source coding and channel coding, Information theory, Huffman coding, LZ coding, Basic concept of convolution code.

Text books:				
1	Electronic Communication System	Fourth Edition, 1999	Gorge Kennedy	Tata McGraw-Hill
2	Digital Communications		Symon Hykin	Wiley, 1988
Reference books:				
1	Electronic Communication Systems	Second Edition, 1993	Frank R. Dungan	Delmar Publishers
2	Communication Electronics	Third Edition, 2007	Louis Frenzel	McGraw-Hill
3	Digital and analog communication systems	Fifth Edition,2003	K. Sam Shanmugam	John Wiley & Sons

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING

FREE ELECTIVE –II Syllabus

CT411	FE 2: MULTIMEDIA AND ANIMATION				L=4	T=0	P=0	Credits=4
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration		
	15	15	10	60	100	3Hrs		
OBJECTIVES					OUTCOMES			
1.To learn basics of multimedia, applications of multimedia, requirements to make good multimedia. 2.To study Multimedia hardware, Macintosh and windows production platforms, multimedia authoring tools. 3.Multimedia building blocks. 4.The basics of animation, techniques of animation. 5.Animation in Flash. 6.To study 3D Animation, Types of 3D Animation Applications & Software of 3D Animation.					1.To understand the Basics of multimedia. 2.To understand multimedia hardware and multimedia authoring tools. 3.To develop skills in design, illustration, image manipulation, graphic designing, video editing, visual effects and game designing. 4.To apply the fundamental broad-based skills in traditional Animation techniques and emphasize to apply in practice. 5.To develop the skills in Flash Animation and apply it on some script. 6.To develop the 3D Animation skills.			
PO, PSO MAPPING :- a,b,c,d,e,g,h,i,j,k,l								

SYLLABUS

- UNIT I** Multimedia – definitions, CD-ROM and the multimedia highway. Applications of multimedia, introduction to making multimedia, the stages of project, requirements to make good multimedia, multimedia skills and training, the multimedia tech.
- UNIT II** Multimedia hardware, Macintosh and windows production platforms, hardware peripherals, connections, memory and storage devices, input devices output hardware, communication devices, media software, basic tools, making instant multimedia authoring tools.
- UNIT III** Multimedia building blocks – text- using text in multimedia, computers and text, font editing and design tools, Sound-the power of sound , multimedia system sound, Digital audio, preparing digital audio files, Audio file format, images- Making still Images, Color, Image file format, video- Broadcast video standard, Analog video, Digital video, optimizing video files for CDROM .
- UNIT IV** What is meant by Animation, Why we need Animation, History of Animation, Uses of Animation. Types of Animation, Principles of Animation, Some Techniques of Animation, and Animation on the WEB, Special Effects, and Creating Animation.
- UNIT V** Creating Animation in Flash: Introduction to Flash Animation – Introduction to Flash – Working with the Timeline and Frame-based Animation - Working with the Timeline and Tween-based Animation – Understanding Layers – Action script.
- UNIT VI** 3D Animation & its Concepts, Types of 3D Animation, Skeleton & Kinetic, 3D Animation Texturing & Lighting of 3D Animation, 3D Camera Tracking, Applications & Software of 3D Animation.

TEXT BOOKS:

1. Multimedia Making Work by Tay Vaughan (TMH), 3rd Ed.
2. Principles of Multimedia by Ranjan Parekh, 2007, TMH.
3. Multimedia Technologies by Ashok Banerji, Ananda Mohan Ghosh, McGraw Hill Publication.

REFERENCE BOOKS:

1. Multimedia systems design by K. Andleigh, K. Thakkrar, Phi Pub.
2. Multimedia: Computing, Communications & Applications by Raif Stein Metz and Kiara Nahrstedt.
3. Advanced Multimedia Programming by Steve Rimmer, McGraw Hill Pub.

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING

FREE ELECTIVE –II Syllabus

CT412	FE 2: CURRENT TRENDS AND TECHNOLOGIES				L=4	T=0	P=0	Credits=4
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration		
	15	15	10	60	100	3Hrs		
OBJECTIVES					OUTCOMES			
1. The objective of this course is to make the students aware of the basic fundamentals of communication. 2. Growth of technologies in Internet, E-Technologies & E-Learning. 3. Students should know about the Green Computing and its implementation .					1.Using the Basics of Internet for deployment of various servers and recourses. 2.Designing and implementation of E-technologies 3.Design E-Learning Resources. 4.Choose appropriate processors and Real Time System for Green Computing. 5.Develop the Social Networking for next generation.			
PO,PSO MAPPING :- a,b,c,d,e,f,g,h,i,j,k,l,m								

SYLLABUS

- UNIT I** Fundamentals of Communications: Types of communication- Wired, wireless, mobile, Modes of transmission: Simplex, Half Duplex, Full Duplex, Multiplexing techniques, History and evolution of wireless and mobile systems, Transition and characteristics of 1G, 2G, 3G, 4G, Spectrum, regulations, and frequency allocation.
- UNIT II** Fundamental of INTERNET: History, Internet working, Connections, Internet services, The World Wide Web, Tools for the WWW, Web servers, Web browsers, Web page makers and editors, Plug-ins and delivery vehicles.
- UNIT III** E-Technologies : Electronic Commerce: Framework, Media Convergence of Applications, Consumer, Applications, Organization Applications, Electronic Payment Systems: Digital Token, Smart Cards, Credit Cards, Risks in Electronic, Payment System, Designing Electronic Payment Systems, Electronic Data Interchange (EDI): Concepts, Applications, (Legal, Security and Privacy) issues, EDI and Electronic Commerce, Standardization and EDI, EDI Software, Implementation, EDI Envelope for Message Transport, Internet-Based EDI.
- UNIT IV** E-Learning: Definition, Introduction, Types of e-Learning: Learner-led e-Learning , Facilitated e-Learning , Instructor-led e-Learning , Embedded e-Learning, Tele monitoring And e-Coaching E-Learning Models: WBT, CBT, LMS, LCMS , Virtual School Systems, E-Learning Tools And Technologies: e-mail, Online Discussion, Chat and Instant Messaging, Voting, Whiteboard, Application Sharing, Conferencing, Online Meeting Tools ,Case study.
- UNIT V** Green Computing: Introduction, Why....Green Computing? Approaches to Green Computing- Virtualization, Power Management, Power supply, Storage, Video Card, Display, IT Equipment, Recycling, Remote Conferencing & Telecommuting Strategies, Product longevity, Resource allocation, Terminal servers, Operating system support, How to Implement? Industrial implementations of Green Computing- Blackle, Fit-PC, Zonbu computer, Sunray thin client.
- UNIT VI** Social Networking: Definition, Overview of Social Networking Sites, Types of Social Networking Sites: General purpose, Niche. Advantages of Social Networking Sites, Drawbacks of Social Networking Sites, Features and Need of Social Networking, Security Issues with Social Networking Sites, Case Studies.

TEXT BOOKS:

1. Impact of E-Business Technologies on Public and Private Organizations by OzlemBak, Nola Stair.
2. Mobile Computing by Tomasz Imielinski , Henry F. Korth .
3. Broadband telecommunications technology by Byeong Gi Lee, Minho Kang, Jonghee Lee.

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
FREE ELECTIVE –II Syllabus

CT412	FE 2: CURRENT TRENDS AND TECHNOLOGIES				L=4	T=0	P=0	Credits=4
	Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration	
15		15	10	60	100	3Hrs		

REFERENCE BOOKS:

1. Introduction to broadband communication systems by Cajetan M. Akujuobi, Matthew, N. O. Sadiku.
2. E-Learning Tools and Technologies William Hortan, Katherine Hortan, Wiley Pub
3. Internet (Use of Search Engines Google & Yahoo etc).

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING

FREE ELECTIVE –II Syllabus

IT408	Applications of Computer Networks		L=4	T=0	P=0	Credits=4
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs.

OBJECTIVES: -

1. To understand the concepts in Computer Networking.
2. To understand the OSI and TCP/IP reference model.
3. To understand various networking devices and its functions.
4. To understand basic networking protocols
5. To understand the basics of Internet and its applications and security threats

UNIT I

[07Hrs.]

Introduction: Overview of a Network: Terminal, Growth of Computer Networking, Computer Networking devices: Hubs, switches, routers, repeaters, modems, NIC, Types of Networks: Local Area Network(LAN),Wide Area Network(WAN) and MAN, Network Architecture: Peer-to-peer Architecture, Client/Server Architecture.

UNIT II

[07 Hrs.]

LAN Topologies: Star Topology, Ring Topology, Bus Topology, Different Transmission Media: Copper Wires, Glass Fibers, Radio, Satellites. The OSI reference model. TCP/IP reference model, Comparison of OSI & TCP/IP reference model.

UNIT III

[06 Hrs.]

Types of services: connection-oriented, connectionless, Switching techniques: Circuit switching, Packet switching and message switching. Virtual and Datagram circuit, Error detection and correction techniques.

UNIT IV

[07 Hrs.]

Introduction to Network Addressing: Physical, Logical and Port addresses, IP protocol, Classful & classless IP addresses, examples, subnetting & supernetting.

UNIT V

[08 Hrs.]

Internet and World Wide Web: Working of web browser architecture, URL and its types Internet Protocols: Transmission Control Protocol , User Datagram Protocol, File Transfer Protocol, Hypertext Transfer Protocol, Telnet, email, MIME, SMTP.

UNIT VI

[07 Hrs.]

Network Security: attacks, security services, a model for internet work security, encryption model, steganography, System security: Intruders, viruses and worms – intruders, viruses and related threats, Fire walls: design principles, trusted system, Introduction to electronics-commerce and Security overview of electronic-commerce.

1. Distinguish between various types of computer networks.
2. Demonstrate basic understanding of hardware , software and types of transmission media used in computer networks .
3. Understand classful and classless IP Addressing.
4. Understand the concept of protocols used in different layers.
5. Understand basic knowledge of cryptographic techniques and its applications.

Program outcome mapped: a, b, e, i, m

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
FREE ELECTIVE –II Syllabus

IT408	Applications of Computer Networks		L=4	T=0	P=0	Credits=4
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs.

Text books:

1	Computer Networks	5 th edition	Andrew Tanenbaum	Prentice Hall
2	TCP/IP Protocol Suite	3 rd edition	Behrouz.A.Forouzan	Tata McGraw Hill Pub
3	Cryptography & Network Security	2 nd edition	Behrouz.A.Forouzan	Tata McGraw Hill Pub
2	Computer Networks and Internets with Internet applications	4 th edition (2003)	Douglas E.Comer	Prentice Hall
3	Fundamentals of Information Technology	2 nd edition (2009)	Alexis Leon	Vikas publishing house
4	Web Technologies TCP/IP Architecture, and Java Programming	Second Edition	Achyut S. Godbole and Atul Kahate	Tata McGraw Hill Pub

Reference books:

1	Computer Networks & E-commerce	2000	Parag Diwan	Pentagon Pub
---	--------------------------------	------	-------------	--------------

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
FREE ELECTIVE –II Syllabus

GE415	Probability Theory & statistical Inference				L=4	T=0	P=0	Credits=4
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration		
	15	15	10	60	100	3 Hrs		

Probability Theory And Statistical Inference

Unit I : Special probability distributions

Standard distribution—Binomial , Poisson, Geometric, Uniform, Exponential, Normal, Gamma and Beta distribution . Chi -squares , Students t and F -distribution. Central limit theorem

(8)

Unit II : Sampling Theory.

Population and sample. Statistical inference. Sampling with and without replacement. Random samples, random numbers , population parameters, sample statistics . Sampling Distribution of means (σ known and σ unknown). Sampling distribution of proportions. Sampling distributions of sum & difference of mean and proportions.

(7)

Unit III : Estimation.

Unbiased and efficient estimates. Point estimates and interval estimates . Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions, Confidence interval for variances

(6)

Unit IV : Testing of Hypothesis .

Statistical decision . Statistical hypothesis, null hypothesis. Test of hypothesis and Significance . Type I and Type II errors, level of significance. One tailed and two tailed tests. Hypothesis testing of mean , proportions and difference of means (for large and small samples) . Hypothesis testing of variance. Chi-square test of goodness of fit

(8)

Unit V : Analysis of Variance :

Analysis of variance . Completely randomized designs, Randomised block designs.

(8)

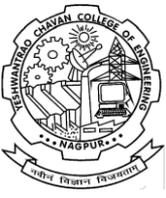
Unit VI : Non parametric test

Introduction to nonparametric statistics . The sign test for paired data, rank sum test , The Mann-Whitney U Test and Kruskal - Wallis test .

(7)

Text Books :-

- 1) The theory and problems of probability and Statistics : M. R. Spiegel, Schaum series (McGraw Hill)
- 2) Basic Statistics for Business and economics by E. K.B owen, M. K.Star (McGraw Hill)
- 3) Statistics for management 7th edition R.I .Levin and D. S .Rubin (P.H.I)
- 4) Probability and Statistics for Engineering 6th edition, Miller Freund and Johnson.
- 5) Fundamentals of Mathematical statistics by Gupta and Kapoor.



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

Ph.: 07104-237919, 234623, 329249, 329250 Fax: 07104-232376, Website: www.ycce.edu

Office of Dean (Academic Matters)

Ref. No: YCCE/DAM/2015-16/445

Date: 18.04.2016

Sub: Modification in Scheme of Examination 2010 of U.G. Program in Mechanical Engineering

The Scheme of the Seventh Semester BE in Mechanical Engineering under U.G. Program is changed. The **Free Elective-II subject ME465 Power Generation Engineering** has been added. The Scheme of UG-Mechanical Engineering Seventh Semester a have been revised as a consequence. The revised Scheme with version number 1.04 is attached with this notification.

It may please be noted that the above one courses are additional Free Electives.

All concerned are requested to take the note of revision.

S.D. Bhole

Dean (Academic Matters)

To:

- Registrar
- Controller of Examinations
- Head of Mechanical Engg.
- MIS Section

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING

FREE ELECTIVE –II Syllabus

ME465	POWER GENERATION ENGINEERING	L=4	T=0	P=0	Credits=4
--------------	-------------------------------------	------------	------------	------------	------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objective	Course Outcome
1.To study the basics of power generations systems. 2.To study conventional & non-conventional power plants. 3.To study the combined operations of different power plants. 4.To study Power load analysis & Economic analysis of power generations systems. [a,c,d,e,h,j,k,l]	(I)
	(II)
	(III)
	(IV)
	(V)

Unit 1 **[7 Hrs]**
THERMAL POWER PLANT- I
 Introduction to thermal power plants and power plant layouts. Site selection.
 Fuel characteristics, handling, storage, preparation & firing methods. Ash & dust collection and handling.
 Boiler: classification, general arrangement, details of different components and system like draught system, steam turbine systems, condenser, cooling towers. [a, d, h, j, l]

Unit 2 **[8 Hrs]**
THERMAL POWER PLANT- II
 Gas Turbine Power Plant: -Introduction, power plant layouts, Open cycle, close cycle power plants. Various components and systems. Methods to improve efficiency. Reheat and Regeneration cycle and their combinations
 Diesel Electric Power Plant: - Introduction, Outline, type of engines, different components, performance, plant layout.
 Comparison with other power plant. (visit to nearby power plant shall be arrange for the students) .[a,d, l,]

Unit 3 **[7 Hrs]**
HYDROELECTRIC POWER PLANT.
 Hydrology: - Rainfall, Runoff, Hydro graph, flow duration curve, mass curve.
 Hydroelectric power plant: - Site selection, classification of hydroelectric power plant, general arrangement, details of different components, turbine selection.Governing.
 Comparison with other power plant. .[a, c, e, l]

Unit 4 **[8 Hrs]**
POWER PLANT ECONOMICS
 Load Analysis - Fluctuating Load on power plants, Load curves, various terms & definition, peak load, effect of fluctuating load.
 Economic Analysis: - Cost of electric energy [a, c, e, l]

Unit 5 **[8 Hrs]**
NUCLEAR POWER PLANT
 Introduction to Nuclear Engineering, Global scenario, prominent installations worldwide, present & proposed nuclear plant in India.
 Nuclear Reactors: - Types of reactors, PWR, BWR, CANDU, Gas cooled, liquid metal cooled, Breeder reactor. Operational requirements and difficulties, site selection for location of a nuclear power station Nuclear Waste Disposal.
 Comparison with other power plant. .[a, h,]

Unit 6 **[7 Hrs]**
COMBINED OPERATION OF DIFFERENT POWER PLANTS
 Combined operation: - Need division, combination of different plant & their coordination, advantages.
NON CONVENTIONAL POWER GENERATION SYSTEMS
 Introduction to Non Conventional power Generation Systems
 Geo-Thermal Power Plant, Tidal Power Plant, Wind Power Plant, Solar Power Plant. [a, d, h, j, l]

.Text books:

S.N.	Title of the book	Edition (Year of publication)	Author(s)	Publisher
1	Power Plant Engineering	2002	Domkundwar.	Dhanpat Rai & Co.

.Reference books:

S.N.	Title of the book	Edition (Year of publication)	Author(s)	Publisher
1	Power Plant Engineering	2007	Vopal & Slortzki	


 Chairperson


 Dean (Acad. Matters)

Date of Release- April 2016

Applicable for
 2016-17 Onwards