GOVERNMENT COLLEGE OF ENGINEERING, JALGAON.
Department of *Electrical Engineering.*
Scheme for B. Tech. (Electrical Engineering)
SEM III

Course Code	Name of the Course	Group	Teaching Scheme Hrs/ week				Evaluation Scheme							Credits
							Theory				Practical		Total	
			TH	TUT	PR	Total	ISA	IS1	IS2	ESE	ICA	ESE		
SH 201	Engineering Mathematics III	A	3	1	-	4	10	15	15	60	-	-	100	4
EE 201	Electronic Devices and Linear Integrated Circuits	B	3	-	-	3	10	15	15	60	-	-	100	3
EE 202	Electrical Circuit Analysis	D	3	-	-	3	10	15	15	60	-	-	100	3
EE 203	Electrical and Electronic Measurements	D	3	-	-	3	10	15	15	60	-	-	100	3
EE 204	Power Plant Engineering	B	3	-	-	3	10	15	15	60	-	-	100	3
EE 205	Electronic Devices and Linear Integrated Circuits Lab	B	-	-	2	2	-	-	-	-	25	25	50	1
EE206	Mini Project-I	B	-	-	2	2	-	-	-	-	50	-	50	1
EE207	Electrical Circuit Analysis Lab	D	-	-	2	2	-	-	-	-	25	25	50	1
EE208	Electrical and Electronic Measurements Lab	D	-	-	2	2	-	-	-	-	50	25	75	1
EE209	Electrical and Electronic Material Lab	D	-	1	--	1	-	-	-	-	25	-	25	1
EE261	Circuit Simulation Lab	B	-	-	2	2					50		50	2
		Total	**16**	**2**	**10**	**28**	**50**	**75**	**75**	**300**	**225**	**75**	**800**	**23**

ISA :Internal Sessional Assessment **ISE : In Semester Examination** **ESE: End Semester Examination**
ICA : Internal Continuous Assessment **TH: Theory Lecture,** **TUT: Tutorial,** **PR: Practical**

- **ISA**: Internal Sessional Assessment should support the principle of continuous assessment and may be based on three / four different tools like surprise test, quiz, group discussion, home assignments, presentation skills, attendance etc
- **ICA :** Internal Continuous Assessment should support for regular performance of practical and its regular assessment with proper understanding the principles of experimental set-up/experiment carried out.

GOVERNMENT COLLEGE OF ENGINEERING, JALGAON.
Department of *Electrical Engineering.*
Scheme for B. Tech. (*Electrical Engineering*)
SEM IV

Course Code	Name of the Course	Group	Teaching Scheme Hrs /week				Evaluation Scheme							Credits
							Theory				Practical		Total	
			TH	TUT	PR	Total	ISA	IS1	IS2	ESE	ICA	ESE		
EE 251	Electromagnetic Fields	D	3	-	-	3	10	15	15	60	-	-	100	3
EE 252	Fundamentals of Electric Machinery	D	3	-	-	3	10	15	15	60	-	-	100	3
EE253	Digital Electronics and Microprocessors	D	4	--	--	4	10	15	15	60	--	--	100	4
EE254	Power System	D	3	--	--	3	10	15	15	60	--	--	100	3
EE255	Signals and Systems	B	3	--	--	3	10	15	15	60	--	--	100	3
SH 204	General Proficiency -II	C	1	-	2	3	-	-	-	-	25	25	50	2
EE256	Electrical Workshop	D	--	--	2	2	--	--	--	--	50	-	50	1
EE257	Digital Electronics and Microprocessor Lab	D	--	--	2	2	--	--	--	--	25	25	50	1
EE258	Signals and Systems Lab	D	--	--	2	2	--	--	--	--	25	25	50	1
EE259	Power System Lab	D	--	--	2	2	--	--	--	--	25	25	50	1
EE260	Electrical Machines Lab I	D	--	--	2	2	--	--	--	--	25	25	50	1
		Total	**16**	**-**	**12**	**28**	**50**	**75**	**75**	**300**	**175**	**125**	**800**	**23**

ISA :Internal Sessional Assessment ISE : In Semester Examination ESE: End Semester Examination
ICA : Internal Continuous Assessment TH: Theory Lecture, TUT: Tutorial, PR: Practical

- **ISA**: Internal Sessional Assessment should support the principle of continuous assessment and may be based on three / four different tools like surprise test, quiz, group discussion, home assignments, presentation skills, attendance etc

- **ICA :** Internal Continuous Assessment should support for regular performance of practical and its regular assessment with proper understanding the principles of experimental set-up/experiment carried out.

SH201: ENGINEERING MATHEMATICS III

Teaching Scheme: 03L+01T Total 04 **Credits** : 04
Examination Scheme: 15ISE1+ 15ISE2+ 10 ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This course is an advanced level Engineering Mathematics which will further strengthen the knowledge of the students who have completed Engineering Mathematics I and II in their first year which were elementary in nature. The course coverage explores Liner Differential Equation, function of a complex variable, Integral transforms like Laplace, Fourier, and Z-transform, statistics and probability and vector integration and differential. The goal of this course is to understand various differential equations and their solutions with various Integral Transform techniques, together with vector integration and their applications in engineering field.

DESIRABLE AWARENESS/SKILLS/PRE-REQUISITES :

Knowledge of Engineering Mathematics – I and II and their concepts.

COURSE OBJECTIVES:

The prime objective of offering this course is to strengthen the

1. to strengthen the analytical abilities of the students.
2. to make strong foundation of the integral transforms and their inverses.
3. to make students familiar with complex variable, theorems of vector integration and Maxwell's equations.
4. to create zeal of working with higher mathematics as demanded in the widespread field of engineering.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1. solve engineering problems using the principles of solution of differential equations.
2. understand analytic function of a complex variable and able to apply Cauchy Integral theorem and Cauchy residue theorem to solve contour integrations.
3. apply Laplace Transform and Inverse Laplace Transform to solve Initial Value Problems and other related problems.
4. use Fourier transforms, Fourier Sine Transforms, Fourier Cosine transforms, Z transforms and their Inverses to solve various integration problems.
5. use mathematics in higher studies for analysis and optimal design of systems.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	1	1	3	1	2
PO-c	3	--	--	2	2
PO-d	--	--	--	2	2

1- Weakly correlated 2 – Moderately correlated 3 – Strongly correlated

COURSE CONTENT (ON NEXT PAGE)

SH201: ENGINEERING MATHEMATICS III

Teaching Scheme: 03L+01T Total 04 **Credits** : 04
Examination Scheme: 15ISE1+ 15ISE2+ 10 ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

Higher order linear differential equations: n^{th} order linear differential equations with constant coefficient, complementary function and particular integrals, general method, short cut method, method of variation of parameters, linear differential equations with variable coefficient: Cauchy's differential equations and Legendre's differential equations, simultaneous linear differential equations, applications: L-R-C circuits.

Laplace transform: Definition of Laplace transform, Laplace transform of elementary functions, properties of Laplace transform, Laplace transform of special functions: unit step function, Dirac-delta function and periodic functions, inverse Laplace transform: definition and properties, inverse Laplace transform by partial fraction, convolution theorem, using standard results, application of Laplace transform to linear differential equations.

Fourier transform : Fourier integrals, Fourier sine and cosine integrals, Fourier transform, Fourier sine and cosine transform, inverse Fourier transform, application to difference equations.

Vector Calculus: Vector differentiation and its physical interpretation, vector differential operator, gradient, divergence and curl, directional derivatives, solenoidal and irrotational fields, vector identities, vector integration: line integral, surface integral, volume integral, green's lemma, gauss divergence theorem, stokes theorem.

Statistics and probability distributions: Measures of central tendency, dispersion, moments, skewness and kurtosis, correlation coefficient, lines of regression, curve fitting, method of least square, straight lines, second degree parabola, exponential and power curves. Probability distribution: binomial distribution, Poisson distribution, normal distribution,

Complex Variables: Functions of complex variables, analytic functions, C-R equations, conformal mapping, bilinear transformation, Cauchy's theorem, Cauchy's integral formula, Cauchy's residue theorem.

Text books:

1. A text book of Engineering Mathematics (Vol-I and II), P.N.Wartikar and J.N.Wartikar, 07^{th} edition, Pune Vidhyarthi Griha Prakashan, Pune, 2013.
2. A text book of Engineering Mathematics, by N.P.Bali & Manish Goyal, 09^{th} edition, Laxmi Prakashan, 2014.

Reference books:

1. Advanced Engineering Mathematics by Erwin Kreyszig, 8^{th} edition ,Willey Eastern Ltd. Mumbai, 2013.
2. Higher Engineering Mathematics by B. S. Grewal, 33rd edition , Khanna Publication, New Delhi, 1996.
3. Advanced Engineering Mathematics by H. K. Dass, 12th edition, S. Chand Publication, New Delhi, 2003
4. Higher Engineering Mathematics by B. V. Ramana, 12^{th} edition, Tata McGraw Hill, Delhi, 2011.

EE201: ELECTRONIC DEVICES AND LINEAR INTEGRATED CIRCUITS

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This lab course provides knowledge about electronic devices, their characteristic and ability to control high power electrical equipments. This course also provides the knowledge of digital electronics

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and electronics engineering and their concepts.

COUSE OBJECTIVES:

The prime objective of offering this course is to strengthen the Evolution of electronic devices and linear circuits. Hence this subject is intended to learn facts, concepts, principles and applications of electronic devices and linear circuits. Thus, students can sharpen their skills of developing the electronic circuits.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1. apply basic knowledge of science and engineering to understand electronic circuits.
2. conduct practical and able to analyze the data for determination of circuit parameters and response of electronic devices.
3. understand the use of different electronic devices such as BJT,FET,MOSFETs,, Timer and op – amp Ics , etc
4. understand frequency response of amplifiers
5. do higher studies in Power Electronics, Modern Drives and Flexible AC Transmission System (FACTS).

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	1	3	3	2	1
PO-b	2	3	1	3	1
PO-d	1	2	1	2	3
PO-e	3	3	--	--	3
PO-i	--	--	--	--	1

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE201: ELECTRONIC DEVICES AND LINEAR INTEGRATED CIRCUITS

Teaching Scheme: 03L Total 03 **Credits :** 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

Introduction to Diode and its Applications: Introduction to diodes, its classification and characteristics, Load line analysis, diode approximation, half wave and full wave rectification, types of diodes, Zener diode, Tunnel diode, Shottky diode, LED, PIN diode, Photodiode etc Applications of diodes clipper and clamper circuits, voltage doubler circuits, multipliers.

Filters: Passive filters, filters using R-L-C L,C. Pi, LC section filters, design of power supply, applications.

Signals and Amplifiers: BJT-CB,CE,CC configuration, analysis of CB, CC and CE. Low and high frequency response of RC, transformer coupled, dc amplifier, h-parameters, feedbacks in amplifiers, oscillators. Transistor power amplifiers, FET amplifiers biasing, MOSFET, types and nmos, pmos applications.

Power Amplifiers: Power amplifier, types, class A and B amplifier, operation and circuits, distortion, class C, D amplifier, feedback amplifiers, cascade connection, Darlington connection

Operational Amplifiers: The ideal op-amp, equivalent circuit of op-amp, ideal voltage transfer curve, open loop op-amp amplifier configurations, op-amp parameters, block diagram representation of feedback configurations, frequency response, high frequency op-amp. Active filters, low pass filter, high pass filter, band-pass filters, band reject filters, all pass filter.

Linear applications: DC and AC amplifiers, instrumentation amplifier, logarithmic amplifier, voltage to current converter, current to voltage converter, the integrator, the differentiator. Comparators and oscillators. 555 timer as mono-stable, a-stable multi-vibrator, phase locked loops operating principles, 565 PLL applications, voltage regulators-fixed, adjustable, switching, special.

Text Books:

1. Electronic Devices & Circuits by Allen Mottershed, 9th reprint, PHI, 1997.
2.Electronic Devices & Circuits by Robert L.Boylestad and Louis N. Boylsted 8th edition Pearson.,2008.

References:

1. Integrated Electronics by Millman and Halkias,3rd,TMH, 2011.
2. Op-Amp& Linear IC by R. A Gaikwad, 4th edition, TMH,2008

EE202 : ELECTRICAL CIRCUIT ANALYSIS

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This course provides a brief introduction to students to analyze, design and synthesize network with passive and active elements. This course also includes network topologies, circuit theorems, initial conditions of network, Laplace Transform of signals, two port network parameters & Fourier Series of signals. This course provides brief description about sinusoidal steady –state analysis of R-L-C circuits Lectures

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and electronics engineering and their concepts.

COURSE OBJECTIVES:

The objective of the course is to help the students in basic concepts and modern engineering methods of circuit analysis with passive and active elements. Students will be able to learn the application of Kirchoff's laws including node voltage and mesh current methods in circuit analysis, sinusoidal steady state analysis, network theorems in DC and AC cases, analysis of signal waveforms, Laplace Transformation and its applications in electric circuits, mutually coupled circuits, two port networks, Graph theory and Fourier analysis.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1. identify the network, principal elements of electric circuits: nodes, loops, mesh, branches, voltage and current sources and topological description of a network.
2. solve problems related to initial and final condition of a network.
3. write the differential equation of first-order and second –order circuits in standard form and determine the complete solution of first-order and second order circuits
4. analyze electrical circuits in time domain and frequency domain.
5. do higher studies in power system analysis under transient condition with help of modern tools.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	2	1	3	1	--
PO-b	2	2	2	2	1
PO-d	3	2	3	1	3
PO-i	--		3	2	3

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE202: ELECTRICAL CIRCUIT ANALYSIS

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

Network theorems solutions of A.C. Network Equations : A.C. circuit analysis: Thevenin theorem, Norton's theorem, superposition theorem, maximum power transfer theorem, reciprocity Theorem, llengen's Theorem, compensation theorem, application to AC circuits. Classical solution of first and second order differential equations for Series and parallel R-L, R-C, R-L-C circuits, initial and final conditions in network elements, forced and free response, time constants steady state and transient state response.

The Laplace Transformation: Definition and properties (basic theory), partial fraction expansion, Heavisides expansion theorem, shifted and singularity functions, Laplace transform of various periodic and non-periodic waveforms, convolution integral, inverse Laplace transform, transformed network with initial conditions, analysis of electrical network with and without initial conditions by Laplace transform for step, impulse and ramp functions.

Fourier Series and Signal Spectra: Fourier series, evaluations of Fourier coefficients, waveform symmetries as related to Fourier coefficients, convergence in truncated series, exponential form of Fourier series.

Two Port Network and Network Functions: Terminal pairs, relationship of two port variables, Z, Y, transmission parameters and hybrid parameters, interconnections of two port networks. Network Functions for one port and two port, calculations of network functions for ladder and general network, poles and zeros, restrictions on pole and zero locations for driving point and transfer functions, time domain behaviour from pole and zero plot, stability of active network.

Sinusoidal steady state analysis, representation of sine function as rotating phasor, steady state response using phasor, frequency response plot of electrical network (magnitude and phase plot) power transfer and insertion loss of two port network, effective or RMS values, average power and complex power, problems in optimizing power transfer in electrical network.

Network Topology: Concept of graph, tree and co-tree, tie set and cut set matrices and Kirchhoff 's laws to network analysis, choice between loop and nodal analysis, concept of super loop and super mesh, dot convention for coupled circuits, concept of duality and dual networks.

Text Books:

1. Introduction to Circuit Analysis by Bolylestad Robert L , 10th,edition,pearson,2013.
2. Engineering Circuit Analysis by William H. Hayt, Jr. J E. Kemmerly, McGHill. 4th ed, 1986.
3. Network Analysis by M.E.Van Valkenburg, 3rd edition Prentice Hall, 2001

References:

1. Electric Circuits and Networks by K.S. Suresh Kumar, Pearson Education, 2009
2. Basic Circuit Analysis, K.V.V. Murthy and M.S.Kamath, first edition (reprinted with corrections), Jaico Publishing, 1998
3. Network Analysis, N.C. Jagan, Second Edition, BS Publication, Hydrabad.
4 Circuits and networks by A Sudhakar,TMH,4th,ed,2011.

EE203 : ELECTRICAL AND ELECTRONICS MEASUREMENTS

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This course provides a brief introduction to International system of units, dimension of electrical quantities, methods of magnetic measurements, measurement of resistances. Construction, principle of working, torque equation, characteristics, error and adjustment of different types measuring instruments like PMMC, moving iron and electro-static instruments, ammeters, voltmeters, wattmeter's and energy meters. This course also includes a brief introduction to instrument transformers.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and electronics engineering and their concepts.

COURSE OBJECTIVES:

The objective of the course is to provide the knowledge of system of units, absolute and secondary measurement of electrical and magnetic quantities with different methods. In this course students will also learn available methods of measurement of electrical quantities and equipments for measurement. Students will also get the knowledge about construction, principle of operation, torque equations and different torques acting on measuring instruments. They will also learn errors & their adjustment during their use.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1. understand the basic concepts in measurement and measuring instruments.
2. understand the need and process of standardization, calibration of instruments, their significance in process and manufacturing industries for international acceptance.
3. understand the working principles of measuring instruments and their applications with extension of ranges.
4. select instruments on basis of accuracy, sensitivity and response time in generation transmission, manufacturing, power system ,testing and energy auditing purposes.
5. perform technical and professional duties in any type of industries.
6. do higher studies and use of modern instruments for techno-economical developments.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
PO-a	--	3	2	1	3	2
PO-b	3	1	2	1	2	3
PO-d	3	2	--	2	--	3
PO-e	2	2	3	1	2	3

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE203 : ELECTRICAL AND ELECTRONICS MEASUREMENTS

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

Electrical Measurement and Measuring Instrument: Fundamentals of measurements , definition of measurement, classification of instruments. Instrument characteristics, PMMC, moving iron, dynamometer and induction type instruments. Ammeter, voltmeter, wattmeter and energy meter.

Measurement of Resistance, Inductance and Capacitance: Measurement of low, medium and high resistance, insulation resistance, earth resistance, Meggar. Kelvin double bridge, A.C bridges for measurement of inductance and capacitance.

Instrument Transformers and Special Measuring instruments: Introduction to instrument transformers, Use of CTs and PTs, special measuring instruments-static and dynamic characteristics, dynamometer type single and three-phase power factor meter, dynamometer type synchroscopes, Merz Price maximum demand indicator, permeability meter, flux meter.

Electronic Measurements: Average, peak and true rms response instruments, Hall effect instruments, electronic voltmeter, multi meter, wattmeter and energy meter. Cathode ray oscilloscope: time, frequency and phase angle measurement using CRO. Spectrum and wave analyzer, digital counter/digital frequency meters, harmonic and distortion analyzer.

Introduction to Instrumentation: Definition of instrumentation, purpose of instrumentation, sensors and transducers: definition, classification, selection of transducers, resistive, inductive, capacitive transducers. Hall effect transducer Potentiometers, frequency counters and displays.

Measurements of Non-electrical quantities: Force measurement using strain gauges, displacement measurements using LVDT, temperature measurement using RTD, thermistor, thermocouple, Pressure sensors bellows, diaphragm and bourdon tube, flow measurement using rotameter, electromagnetic flow meter. Speed measurement using magnetic pick-up and photoelectric pick-up.

Text Books:

1. A course in Electrical and Electronic Measurements and Instrumentation by A.K. Sawhney Dhanpat Rai and Sons, 11th, edition 1995.
2.Electric Measurement and Measuring Instruments by E.W Golding A. H. Wheeler and Co, Allahabad, 3rd, edition1983.
3.Modern Electronic Instrumentation and Measurement Techniques by Helfrick and cooper PHI, 1st, edtion, 2007.

References :

1.Electrical and Electronic Measurements by J B Gupta, Kataria,12th, edition,2003.
2.Measurement Systems by D. Manik,TMH, 5th,edition,2008.
3 Instrumentation Measurement and Feedback by B.E Jones,TMHl, 2nd,edition 1978

EE204 : POWER PLANT ENGINEERING

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This course provides knowledge of basic fundamentals and components required in power plant engineering, working principals and performance evaluation. The course also provides the latest technology involved in power plant engineering.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and mechanical engineering and their concepts.

COURSE OBJECTIVES:

The prime objective of offering this course is to strengthen the
The objective of the course is to impart the fundamental knowledge about the power plants. Students develop their ability to apply the specific procedures to analyze the performance and their suitability of power plant components. The students will able to understand basic components of power plant their working principles and will be familiar with the use of different equipments. Safety precautions on work place. This makes bridge on theoretical knowledge and practical practices.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1.apply basic knowledge of science, mathematics and engineering for understanding thermal studies.
2. understand advantages, disadvantages of different types of power plants on the basis of economy and environmental aspects.
3. understand basic working, selection of different boilers, their mountings and accessories.
4. understand selection of water turbine for hydro electric power plant and working of diesel engine power plant.
5. understand basic working of Nuclear power plant, social, safety and environmental considerations.
6. do professional duties in technical field of power plants for economical development.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-b	2	3	3	1	2
PO-d	--	2	3	--	3
PO-e	1	3	2	2	1
PO-i	--	3	3	3	2

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE204 : POWER PLANT ENGINEERING

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

Thermodynamics of Power Plant: Introduction to different types of fuels, classification of fuels. Combustion, excess air.(No numerical treatment on combustion of fuels) Thermodynamic Cycles of steam flow. Rankin Cycle, Reheat cycle. Regenerative cycle(numerical based on above Cycles) gas power cycles. Pulverized coal firing systems, fluidized bed combustion.

Thermal power plants: Types of boilers and boilers mountings and accessories. Heat balance sheet for boiler plant (numerical) layout of thermal power plant, site selection of thermal power plant. Requirement of electric power station design. Selection of turbine generator set. Coal handling, storage, preparation and feeding, out plant handling, storage of coal at plant.

Hydro electric power plant: Introduction, classification of hydro electric plant. Selection of site for hydroelectric plant. Estimation of power available. Hydraulic turbine, Pelton wheel, Francis and Kaplan turbine. Performance of water turbines (numerical) cavitations in water turbines. Draft tubes, selection of hydraulic turbines. Governing of turbines, safety measures in hydro station.

Nuclear power plant: Introduction, plant sitting, basic principles of nuclear energy, energy mass relationship, structure of the atom, radioactive decay, mass defect and binding energy. Nuclear chain reaction, main parts of nuclear reactor and control, classification. Basic reactor system, Radioactive waste disposal, safety features.
Diesel power plant: Introduction, site selection, main components and its working, Diesel plant efficiency, choice and characteristic of diesel power plant.

Power plant Economics and Instrumentation Control: Introduction, cost analysis, estimation and predication of load, Some commonly used terms, factors affecting economics of generation, Distribution of power, tariffs, load shearing instrumentation and control of system electric power station measurement of chemical composition. Impurity measuring instruments, steam generator control.

Text Books :
1. Power Plant Engineering by P. K Nag, Tata McGraw Hill
2. Power Plant Engineering by J. B. Gupta
3. A Power Plant System Engg by Chakraborti, Soni, Gupta Dhanpatrai Publication

Reference Books :
1. Power Plant Engineering by Arora, Domkumdawar,Dhanpatrai and Sons,
2. An Introduction to Power Plant Technology by G. D. Ra, Khanna Publication.
3. Power Plant Engineering by R. K. Rajput, S .Chand
4. Solar Energy by S . P. Sukhatma,
5. http://nptel.iitm.ac.in for video courses

EE205 : ELECTRONIC DEVICES AND LINEAR INTEGRATED CIRCUITS LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 25ICA+25ESE **Total Marks :** 50
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This lab course provides knowledge about electronic devices, their characteristic and ability to control high power electrical equipments. This course also provides the knowledge of digital electronics

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and electronics engineering and their concepts.

COURSE OBJECTIVES:

The prime objective of offering this course is to strengthen the principles of Electronic Devices And Linear Integrated Circuits. The advancements in solid state technology have caused the rapid increase in the use of linear integrated circuits. Hence this subject is intended to learn facts, concepts, principles and applications of linear integrated circuits. Thus, students can sharpen their skills of developing the electronic components and circuits.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1. apply basic knowledge of science and engineering to understand electronic circuits.
2. conduct practical and able to analyze the data for determination of circuit parameters and response of electronic devices.
3. understand the use of different electronic devices such as BJT,FET,MOSFET,IC 555, ICC74 etc
4. understand and implement simple linear integrated circuits, able to design timers, amplifiers.
5. do higher studies in Power Electronics and Signal Conditioning circuits, Modern Drives and Flexible AC Transmission System (FACTS).

RELEVANCE OF COS/POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	2	---	3	1	2
PO-b	3	2	1	2	3
PO-d	3	2	1	---	2
PO-e	2	2	1	1	3
PO-i	3	2	1	2	3

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE205 : ELECTRONIC DEVICES AND LINEAR INTEGRATED CIRCUITS LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 25ICA+25ESE **Total Marks :** 50
Duration of ESE : 03 hrs

The laboratory work should consist of performing minimum 10 experiments of the following based on syllabus of EE201 as per sample list given below. Few experiments should involve simulation using P-spice or appropriate software.

1. To design Wave shaping circuit using diode - clipping and clamping circuits.
2. To design voltage regulator circuits and to analyze its regulation and frequency characteristics.
3. To determine the performance characteristics of BJT using AC and DC biasing analysis of CE, CB and CC Configuration.
4. To determine the frequency Response of a BJT/FET single stage and multistage amplifier and to study the effect of coupling and bypass capacitor on the frequency.
5. To analyze Class A transformer coupled and Class B push-pull symmetry complementary amplifiers.
6. To obtain the drain and transfer characteristics of JFET.
7. To estimate common mode gain, differential gain, common mode rejection ratio of a CE differential amplifier.
8. To design and test dependent voltage and current sources using an OPAMP and to determine their frequency response.
9. Analysis and applications of active circuits using OPAMP:
   (i)Comparator (ii) Zero Crossing Detector
   (iii) Integrator (iv) Logarithmic amplifier (v) Differentiator.
10. To design the active filters and oscillators using OPAMP and determine their frequency stability: (i) Low pass, (ii) High pass, (iii) Band pass, (iv) Band reject, (v) All pass, (vi) Phase Shift oscillator, (vi) Wein Bridge Oscillator.
11. To design Multivibrators using OPAMP: (i) Schmitt Trigger, (ii) Monostable Multivibrator, (iii) Bistable Multivibrator (iv) Astable Multivibrator.
12. To operate Timer IC 555/556 as : (i) Schmitt Trigger, (ii) Monostable
    (iii) Astable,(iv) Sequence Timer.
13. To design the voltage regulators using voltage regulator IC's 78xx and 79xx, LM 317 etc.
14. To determine the lock range, free running range and capture range of PLL565.
15. To design and test the given electronic application.
16. To perform the analysis and fault diagnosis of given electronic circuit.

Note :

Guide lines for ICA: Internal Continuous Assessment shall support for regular performance of minimum 10 practicals and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student(journal) based on practicals performed by student. The performance shall be assessed experimentwise using internal continuous assessment format(S10).

Guide lines for ESE: The end semester examination(ESE) for the laboratory course of three hrs duration, shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

EE206 : MINI PROJECT-I

Teaching Scheme: 02P Total 02 **Credits** : 02
Examination Scheme: 50ICA **Total Marks :** 50

COURSE DESCRIPTION:

The course explores the knowledge of design, experiment and analysis of data. The course develops ability to work on multidisciplinary teams, Identify, formulate, and solve engineering problems in view of economic, environmental and societal context.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and electronics engineering and their concepts.

COURSE OBJECTIVES:

The objectives of project are to develop ability to work in group. The scope of work is design and conduct experiments, as well as to analyze and interpret data within realistic constrain such as economic, environmental, social, safety and manufacturability. The project work provides plate form for planning, material procurement, preparing specification and execution of work. The project also develop to work on multidisciplinary teams, communicate effectively and Knowledge of contemporary issues.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1. apply knowledge of mathematics, science, and engineering for innovative ideas. Identify, formulate, and solve engineering problems by understanding professional and ethical responsibility.
2. design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
3. function on multidisciplinary teams, communicate effectively and Knowledge of contemporary issues.
4. understand the impact of engineering solutions in a global, economic, environmental, and societal context.
5. recognition of the need for, and an ability to engage in life-long learning and use the techniques, skills, modern engineering tools and software necessary for engineering practice.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	2	2	3	--	3
PO-b	3	2	3	--	1
PO-c	2	2	3	--	1
PO-d	2	2	3	3	2
PO-e	3	2	3	3	2
PO-f	3	2	3	--	-

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE206 : MINI PROJECT-I

Teaching Scheme: 02P Total 02 **Credits** : 02
Examination Scheme: 50ICA **Total Marks :** 50

Mini project : Consists of fabrication of small electrical circuit or product having education value or industrial usage or commy service, research value.

It should based on Network Theorems , Electrical or Electronic Circuits, Digital Circuit and Microprocessor, Measurement etc or Drawings related to domestic and industrial utility supply / plants

- Each student shall work on an approved project, a group of 4-5 students (maximum) shall be allotted for the each minor project and same group may be continued for major project.
- Mini project may involve fabrication, design or investigation of a technical problem that may take design, experimental or analytical character or combine element of these areas. The project work shall involve sufficient work so that students get acquainted with different aspects of fabrication, design or analysis.
- Each student is required to maintain separate log book for documenting various activities of minor project.
- The three-member committee appointed by Head of the department shall be constituted for finalizing the topics of minor project. Maximum four minor project groups shall be assigned to one teaching staff.

Every student shall undertake the Minor Project-I in semester IV. It is expected that the broad area of major project shall be finalized by the student in the beginning of the IV semester and Minor project undertaken may be a part of Major Project.

Table-A.

Assessment of Mini Project
Name of the Project: _____

Name of the Guide: _____
Evaluation may contain

S.No.. Exam Seat No Name of Student

Project Selection Documentation , Design/ Simulation/Logic PCB/hardware/programming, Result, Verification, Presentation and Report Total = **50 marks**

Note :

Guide lines for ICA: Internal Continuous Assessment shall support for regular performance of minimum 10 practical's and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical's performed by student. The performance shall be assessed experiment wise using internal continuous assessment format (S10).

EE207 : ELECTRICAL CIRCUIT ANALYSIS LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 25ICA+25ESE **Total Marks :** 50
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This laboratory provides introduction to Electrical engineering students with a focus on circuit components and analysis. This laboratory provides comprehensive study of fundamental concepts of ac and dc networks, network theorems, measurement of circuit parameters and transient response of simple RLC circuits.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic Electrical and Electronics engineering and their concepts.

COURSE OBJECTIVES:

The prime objective of offering this course is to provide students with the essential principles of ac and dc electric circuit and basic circuit parameters. This course will help student to understand concept of network theorems, transient response of series and parallel RLC circuits and coupled circuits and two port networks. This course will help the student to apply the network concepts to solve the real life electrical engineering problems. The scope of this course is very wide and it is very important for the further studies and research work.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1. introduce the concept of circuit elements, lumped circuits, circuit laws and reduction.
2. analyze the electric network concepts, topology and equations.
3. know the solution of differential equations and Laplace transform.
4. use the knowledge of different theorems, pole zeros and different types of network.
5. relate the knowledge of Z, Y, H parameters, Fourier series to understand the behaviors of network.
6.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	2	2	3	1	2
PO-b	3	2	1	2	3
PO-d	2	2	1	1	2
PO-e	---	1	2	3	2
PO-i	---	2	---	---	---

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE:207 ELECTRICAL CIRCUIT ANALYSIS LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 25ICA+25ESE **Total Marks :** 50
Duration of ESE : 03 hrs

The laboratory work should consist of performing minimum 10 experiments of the following based on theory syllabus of EE202 as per sample list given below.. Few experiments should involve simulation using P-spice or appropriate software.

List of experiments:

1. Verification of Superposition theorem in A.C. circuits.
2. Verification of Thevenin's theorem in A.C. circuits.
3. Verification of Reciprocity theorem in A.C. circuits.
4. Verification of Millman's theorem.
5. Determination of time response of R-C circuit to a step D.C. voltage input. (Charging and discharging of a capacitor through a resistor)
6. Determination of time response of R-L circuit to a step D.C. voltage input. (Rise and decay of current in an inductive circuit)
7. Determination of time response of R-L-C series circuit to a step D.C. voltage input.
8. Determination of parameter of two port network.
9. Harmonic analysis of no load current of a transformer.
10. Determination of resonance, bandwidth and Q factor of R-L-C series circuit.
11. Determination of resonance of R-L-C Parallel circuit.

Note :
Guide lines for ICA: Internal Continuous Assessment shall support for regular performance of minimum 10 practical's and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student(journal) based on practical's performed by student. The performance shall be assessed experiment wise using internal continuous assessment format(S10).

Guide lines for ESE: The end semester examination(ESE) for the laboratory course of three hrs duration, shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

EE:208 ELECTRICAL AND ELECTRONICS MEASUREMENT LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 50ICA+25ESE **Total Marks :** 75
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

In this laboratory, course emphasis on imparting the practical knowledge and understanding of basic principles, characteristic, performance of different measuring instruments and measurement of different electrical quantities. It also gives the platform to understand need and importance of calibration and standardization.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and electronics engineering and measurement concepts.

COURSE OBJECTIVES:

The prime objective of offering this course is to impart the fundamental knowledge of measuring instruments. Students develop their ability to select the specific instrument in reference of ranges and resolution of instruments for proper and correct analysis. The students will able to understand the characteristic of measuring instruments. In this lab course, students will be familiar with the use of different equipments, safety precautions on work place. This makes bridge on theoretical knowledge and practical practices.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1. conduct practical and able to analyze the practical data for various purposes.
2. measure various electrical quantities and circuit parameters
3. able to select the measuring instrument with proper range and type for practical uses.
4. understand methods of measurement of power and energy.
5. calibrate various types of instruments as per IS .
6. do professional duties in technical field and able to use advance measuring instruments.

Relevance of COs /POs and strength of co-relation:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
PO-a	2	---	3	1	2	3
PO-b	2	2	1	3	2	2
PO-d	1	2	2	3	2	3
PO-e	2	2	2	3	3	2

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE208 : ELECTRICAL AND ELECTRONICS MEASUREMENT LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 50ICA+25ESE **Total Marks :** 75
Duration of ESE : 03 hrs

The laboratory work should consist of performing minimum 10 experiments of the following based on theory syllabus of EE203 as per sample list given below.

List of Experiments:

1. Study of Moving iron, PMMC and Dynamometer type instruments (Basic moving systems).
2. Measurement of power in three phase circuits by conventional two wattmeter method and by power analyzer.
3. Measurement of flux density using Gauss meter.
4. Measurement of temperature using RTD and thermocouple.
5. Measurement of force using strain gauges.
6. Measurement of Total Harmonic Distortion using power analyzer.
7. Time frequency and phase angle measurement using digital C.R.O.
8. Calibration of Single phase energy meter.
9. Measurement of low resistance using Kelvin double bridge.
10. Measurement of Inductance using Three Voltmeter method and Maxwell's bridge.
11. Measurement of capacitance and loss angle using Schering Bridge.
12. Speed measurement using photoelectric pick up and magnetic pick up. pressure Transducers.
13. Extension of instrument range: ammeter, voltmeter, watt meter using CT / PT.
14. Measurement of power in three phase four wire using three CTs and Two wattmeters.
15. Study and use of CRO for measurement of Current, Voltage, Time period, Frequency, Phase angle.

Note :
Guide lines for ICA: Internal Continuous Assessment shall support for regular performance of minimum 10 practical's and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student(journal) based on practical's performed by student. The performance shall be assessed experiment wise using internal continuous assessment format(S10).

Guide lines for ESE: The end semester examination(ESE) for the laboratory course of three hrs duration, shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

EE209 : ELECTRICAL AND ELECTRONIC MATERIAL LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 50ICA **Total Marks :** 50

COURSE DESCRIPTION:

In this laboratory, course emphasis on imparting the practical knowledge and understanding of basic Electrical and Electronics engineering materials. It also gives students exposure to insulators, conductors, semi conductors, super conductors and nano-technology principles, their use

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and electronics engineering materials.

COURSE OBJECTIVES:

The prime objective of offering this course is to impart the fundamental knowledge of Electrical and Electronic Materials. Students develop their ability to select the specific material for proper applications. The students will able to understand the characteristic of Electrical and Electronic Materials. In this lab course, students will be familiar with insulators, conductors, semi conductors, super conductors and nano-technology principles, their use. This makes bridge on theoretical knowledge and practical practices.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1. know characteristics of electrical and electronic materials
2. selection of specific material for particular applications
3. principles of nano-technology and nano-materials
4. effect of materials on components properties
5. do professional duties in technical field and able to use advance measuring instruments.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-b	3	2	3	1	3
PO-d	2	1	2	2	2
PO-e	3	3	3	--	3
PO-g	--	--	3	--	--

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE:209 ELECTRICAL AND ELECTRONIC MATERIAL LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 50ICA **Total Marks :** 50

Conductors: Classification, High conductivity, high resistivity materials, Fundamental requirements of high conductivity materials and high resistivity Materials, Mobility of electron in metals, Factors affecting conductivity and resistivity of electrical material, Thermoelectric Effect, See back effect, Peltier effect, Commonly used high conducting materials, copper, aluminium, bronze brass, Constantan, platinum, nichrome properties, characteristics, and applications, Materials used for AC and DC machines.

Semi-Conductors: General concepts, energy bands, Types of semiconductors, intrinsic Semi-conductors, extrinsic Semi-conductors, Compound semiconductor, amorphous semiconductor, Hall effect, drift, mobility, diffusion in Semiconductors, Semi-conductors and their applications.

Dielectrics and Insulators: Properties of gaseous, liquid and solid and solid dielectric, Breakdown in dielectric materials, mechanical and electrical properties of dielectric materials.

Magnetic Materials: Basic terms, Classification of magnetic material, diamagnetic, paramagnetic, ferromagnetic, anti-ferromagnetic and amorphous material, Hysteresis loop, magnetic susceptibility, coercive force, curie temperature, Magneto-striction, factors affecting permeability and hysteresis loss. Common magnetic materials, Soft and hard magnetic materials, Electric steel, sheet steel, cold rolled grain oriented silicon steel, hot rolled grain oriented silicon steel, hot rolled silicon steel sheet, Modern Engineering Materials, Materials for Electronic Components, Resistors, Capacitors, Inductors, Relays, Bipolar transistors, Field effect transistor.

Superconductors: Dielectric, dielectric as a field medium, Electric conduction in gaseous, liquid Superconductivity, Properties of Superconductors, Critical field ,Meissner effect, Type-I and type-II Superconductors, Integrated circuits, Power devices.

Nano-technology: Introduction, Concepts of Energy bands & various Conducting Mechanism in Nano-structures, Carbon Nano-structures, Carbon Molecules, Carbon Clusters, Carbon Nano-tubes, Applications of Carbon Nano-tubes, Special Topics in Nano Technology such as Single Electron Transitor , Molecular Machines, BN Nanotubes, Nano wires Introduction, Nanotechnology, Nano-devices, Solar/Photovoltaic Cell, Introduction, Photo generation of charge carriers, p-n junction,Light absorbing materials: Silicon thin films, concentrating photovoltaic, Nano-materials

References:

1. A.J.Dekker, “Electrical Engineering Materials”.
2. S.P.Seth and P.V.Gupta, “A course in Electrical Engineering Materials”, Dhanpatrai
3. C.S.Indulkar and S.Thiruvengadam, “Electrical Engineering Materials”, S Chand
4. S.P.Chhaiotra and B.K.Bhat, “Electrical Engineering Materials”.

Note :

Guide lines for ICA: Internal Continuous Assessment shall support assignment based on above syllabus and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student. The performance shall be assessed by open book/surprise/ppt etc format(S10).

EE261 : CIRCUIT SIMULATION LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 50ICA **Total Marks :** 50

COURSE DESCRIPTION:

The objective of this course is to introduce the students to the fundamental concepts of the C and C++ programming language, MATLAB and enable them to apply these concepts for solving real world problems. This course includes the basic structure and statements required for simple mathematical problems in MATLAB. This course provides the basic concepts of plot and other useful tools required to solve the problems.

DESIRABLE AWARENESS/SKILLS:

Knowledge of mathematics and subjects, BEE, Computer Fundamentals and C Programming at F. Y. BTech.

COURSE OBJECTIVES:

The prime objective of offering this course is to strengthen the essential knowledge of Application Software packages such as MATLAB Simulink, ANSYS, E-TAP etc. programming. This course will help students to use various modern tools for solving the problems of electrical engineering. The subject provides scope for practical applications of electrical engineering. The course will help students to analyze the electrical systems using the software. The course provides the effective approach for the higher studies in the efficient system design.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

2. implement small and medium programs of varying complexity using the most commonly used features of the various packages such as MATLAB simulink, ANSYS, E-TAP etc.
3. use software analysis, design, simulation, packages used for Electrical Engineering applications.
4. employ good programming style, standards and practices during program development.
5. use modern engineering tools in application software packages, which are useful for analyzing and designing of electronic circuits and electrical machines, power systems.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4
PO-a	2	---	3	1
PO-d	---	2	3	2
PO-e	---	1	3	2
PO-f	1	2	3	3

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE: 261 CIRCUIT SIMULATION LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 50ICA **Total Marks :** 50

The laboratory work should consist of performing minimum 10 experiments of the following based on theory syllabus of EE201,EE202 and EE203 using MATLAB or any other equivalent software packages such as

- ANSYS
- P-spice or appropriate software
- ETAP
- PSCAD
- Power world
- Any other relevant open source software

As per sample list given below

i) Simulation and performance analysis of any 1 phase, 3 phase machine

ii) Any Rectifier/converter/inverter

iii) Power system

iv) Electronic / electrical circuit simulation and performance analyses

v) OPAMP circuits simulation

vi) Time response of AC circuits

vii) Frequency of AC circuits

viii) Study of filters

ix) Study of BJT/MOSTFET circuits

x) Study of active filters

Note :
Guide lines for ICA: Internal Continuous Assessment shall support for regular performance of minimum 10 practical's and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical's performed by student. The performance shall be assessed experiment wise using internal continuous assessment format (S10).

EE251 : ELECTROMAGNETIC-FIELDS

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

Electromagnetic field theory is an important fundamental course with great academic relevance progress in this exciting theory has made possible the advent of many technologies, Interference and electrical noise problems that affect industry can also be better understood and their solutions can be provided using field theory.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic engineering mathematics concepts.

COURSE OBJECTIVES:

Electromagnetic field theory is the subject of great research, academic and industrial importance and has a large number of applications. The objectives to understand basic concepts of static electric field and its associated quantities, Know the boundary condition particularly a boundary between conducting material and free space. The course also deals with significance of moving charges, force between two current carrying conductors, time varying field and radiation and antennas.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1.apply basic concepts of scalars and vector quantities to evaluate the impact of electromagnetic fields.
2. understand the basic concepts of static electric field and its associated quantity to evaluate the force between two point charges using coulomb's law.
3. know the boundary condition, particularly a boundary between conducting material and free space.
4. use poisson's and laplace equations to calculate potential, capacitance and electric field and understand the magnetization principle and bio-savart's law and its importance.
5. analysis how a time varying magnetic field induces an electric field and apply maxwell's equation for analysis of static , dynamic field conditions.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	1	1	1	1	1
PO-b	2	2	2	1	1
PO-c	3	3	3	2	2
PO-d	3	3	3	3	2
PO-f	3	3	3	3	3

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE251 : ELECTROMAGNETIC-FIELDS

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

Vector Analysis: Vector algebra-addition, subtraction, components of vectors, scalar and vector multiplications, triple products, three orthogonal coordinate system. Vector calculus-differentiation, partial differentiation, integration, vector operator del: grad, div. curl; integral theorems of vectors, application of the operator del, types of vector fields, time variation of vectors. Conversion of a vector from one coordinate system to another.

Coulombs's Law, Electric Field Intensity and Flux Density, Divergence: Coulombs' law, the principle of superposition, electric force and the concept of electric field (=E) continuous space distribution of electric charges, the flux of E and Gauss' theorem, electric potential, calculation of E fields by Gauss' theorem and potentials, electric dipole, conductors and insulators in electrostatic field, polarization, generalization of Gauss' theorem, capacitance and examples of capacitors, boundary conditions, steady electric current and electric field -energy and mechanical forces in electrostatic fields - electrostatic forces, energy of charged conductors, energy in electric field, forces and pressure on conductor and dielectrics, stability of electrostatic system, solving electrostatic field problem, electric current, current density and electric force, the conservation of charge and the equation of continuity, electromotive force and the potentials in the electric circuit Ohm's law and joule's law, circuit laws.

The Magnetic Field, Forces, Materials and Inductance: Magnetic force between two small moving charges and the concept of magnetic field. Bio-Savart's law and its application to various configurations. Magnetic flux density vector B and Magnetic flux. The law of conversation of magnetic flux, Ampere's law, magnetic scalar potential, application to various configurations. Magnetic fields of currents in presence of magnetic materials, current loop in a magnetic field (torque and behaviour), elementary current loop and aggregates of current loops. Magnetization vector. Generalization of Ampere's law. Magnetic fields intensity and its interpretation. Boundary conditions, effect of applied magnetic field on materials substances, magnetic characteristics of ferromagnetic materials, B-H curve of iron and hysteresis loops, magnetic circuit, magnetic field problems.

Time varying fields and Maxwell Equations: Time varying fields and electromagnetic inductions-total force between small moving charges, physical meaning of the electromagnetic field, electromagnetic induction, Faradays laws of electromagnetic induction and its generalization, applications of electromagnetic induction. Inductance in terms of induced EMFs, calculation of inductance, Self and Mutual inductance. Interpretation of laws of electromagnetic induction with various examples. Flux linkages and moving field. Forces and Energy in static and quasi-static magnetic fields, energy relations and energy of a magnetic field, potential energy and location of stored energy. Calculation of forces, charge in a magnetic field, and on a circuit, Ampere-Laplace s law. Motion of charged particles in magnetic and electrical fields, energy stored in the magnetic field, reciprocity property of mutual inductance, potential energy and stored

energy, forces and energy in terms of magnetic field vectors, forces on magnetized iron surface, hysteresis loss in iron, inductance in terms of stored energy, internal energy, internal self- inductance, energy and forces in electromechanical systems

The equation of continuity and displacement current, Maxwell's equations in different forms and the constitutive relations consequence of Maxwell's equations, plane electromagnetic waves in free space, boundary conditions with generalizations. Magnetic vector potentials:- Vector potentials and its applications, inductance in terms of vector potentials, application of ,magnetic vector potentials to time- varying fields, retard potential.

Energy Transfer in E.M. fields and Pointing vector: Flow of energy in electromagnetic oscillatory systems, flow of energy, Pointing vector and complex Pointing vector, comments and alternate energy transfer vectors. Magnetic diffusion and Eddy currents, alternating current distribution in a semi infinite conducting block, skin effect and power loss calculation of magnetic diffusion as an electrical transient, diffusion time constant.

Text Books:

1. Electromagnetism by W Hayt,TMH,7th,edition,2006.
2. Elements of Electromagnetism by N N Rao,TMH,6th,edition,2006.

Reference Books

1. Fundamentals of Electromagnetics with MATLAB by Kari E. Lonngren and Sara V. Sarov, PHI 2006
2. Engineering Electromagnetics by Barapte, Techmax,2nd,edition,4th,reprint,2010.
3. Electromagnetism :Problems with solutionby A.Pramanik PHI 2006.
4. The Electromagnetism by Kharate and Narkhade, 2nd,edition,2001.

EE252 : FUNDAMENTALS OF ELECTRIC MACHINERY

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This course is covering Fundamentals of Electric Machinery which will further strengthen the knowledge of the students. The course explores on understanding of construction, basic principles underlying the operation of electrical machines, performance, characteristic and testing of DC Machines. It also gives the platform to understand construction, working, performance and application of transformers, DC machines, special motors.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical engineering and their concepts.

COURSE OBJECTIVES:

The objective of syllabus is to impart the fundamental knowledge of transformers, DC machines and special machines. Students will able to develop their ability to apply the specific procedures for comprehensive treatment of rotating machines. In the earlier stage the machine worked in isolation and its simple analysis was sufficient. Now the electric machines form an integral part of large system comprising of other components as well. The object is not great depth, but presentation through enough to give theory at a level that can be understood by undergraduate. With this beginning, the students will have the foundation to continue his education and able to do better in professional duties in the field of manufacturing, testing operation and control.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to
1.apply basic knowledge of science and engineering to understand transformers and dc electrical machines.
2.understand construction, concepts, principles of operation, testing and application of special function motors.
3. understand the behavior of dc motors and analyze data for qualitative and quantitative parameters to determine characteristics of machines by performing practical.
4.perform professional duties in team of manufacturing, testing, operation and maintenance with the sense of safety precautions.
5.apply knowledge for technological subjects such as utilization of electrical energy, switch gear and machine design for economical and sustainable developments.

Relevance of COs /POs and strength of co-relation:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	1	1	1	3	2
PO-b	1	1	1	3	2
PO-c	3	3	3	3	2
PO-d	2	2	2	3	2
PO-f	3	3	3	3	2

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE252 : FUNDAMENTALS OF ELECTRIC MACHINERY

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

Single Phase Transformer: Transformer construction and practical consideration, transformer reactance and equivalent circuit, engineering aspects of transformer analysis, effect of load on power factor, phasor diagram, excitation phenomenon in transformers-switching transients, Transformer testing-polarity test, open circuit test (O.C.), short circuit test (S.C.), Sumpner's test, auto transformer, instrument transformer-current and potential transformer, pulse transformer and applications

Three Phase Transformers: Review of three phase balanced circuits, study of unbalanced three phase circuit, phasor diagram. Special constructional features, three phase transformer connections, labelling of transformer terminals, star/star, delta/delta ,star/delta, delta/star, delta/zig-zag, star/zig-zag connection, choice of transformers connections, harmonics, parallel operation of transformers, three winding transformer and its equivalent circuit, stabilization by tertiary winding, phase conversion, open delta connection, three to two phase conversion (Scott connection), three to six phase conversion, three to one phase conversion, on-line load tap changing transformers, cooling methodology, types and routine tests according to ISI

D.C .Machines : Construction of field and armature winding, types of armature windings, dc generator, principle of working, e.m.f. equation, classification of dc generator, commutation, types of commutation, causes of bad commutation and remedies, characteristics and applications of different types of dc generators, losses and power stages in dc generator, armature reaction, effect and estimation of amp-turns.

D.C. Motors: Working principle of dc motor and significance of back e.m.f, need of starter, reversal of direction of rotation, classification and characteristics of dc motors, torque equation, speed control by, supply voltage, armature voltage and field control. Applications of different types of dc motors, power stages in dc motor and condition of maximum efficiency.

Text Books:

1. Electric Machines by I J Nagrath and D P Kothari TMH.,2nd edition,2012.
2. Electrical Machines and Transformers by Nasser Syed , New York, 1st,1984.

References:

1. Electrical Machinery by A.E.Fitzgerald, C.Kingsley, S.D.Umans TMH 6th Edition 2002.
2. Design and performance of DC Machines by E.W.Clayton,CBS,3rd,1986.
3. A course in Electrical Machine Design by A.K. Sawhney, Dhanpat Rai,6th,2009.
4. Electrical Machines by J. B. Gupta, kataria,1st,2009.

EE253 : DIGITAL ELECTRONICS AND MICROPROCESSOR

Teaching Scheme: 04L Total 04 **Credits** : 04
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

The course explores knowledge of digital electronics and microprocessor. The course comprises of digital techniques, architecture, assemble language programming and interfacing of peripherals and their applications.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and analog electronics fundamentals.

COURSE OBJECTIVES:

To meet the challenges of growing technology, student will be conversant with the programmable aspect of digital electronics and microprocessor. Programming is a process of problem solving and communication in language of mnemonics. The object of course is to understand digital electronics and microprocessor principles, concept and develop skill in both hardware and programming.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to
1.apply basic digital electronic principles and design concepts
2.know the pin configuration and memory organization of a typical microprocessor
3.develop assemble language programming and interfacing peripherals for wide application in electrical engineering.
4.develop assembly language source code for applications that use I/O ports, timer and single/multiple interrupts and apply techniques for measurement of electrical quantities, protection systems etc. by microprocessor.
5.do higher study in the field of automation, operation and control of power system by microprocessor.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	2	1	--	3	3
PO-b	2	2	--	3	3
PO-c	3	2	3	2	2
PO-d	3	1	2	1	1
PO-e	1	1	1	1	2
PO-f	1	2	1	2	2

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE253 : DIGITAL ELECTRONICS AND MICROPROCESSOR

Teaching Scheme: 04L Total 04 **Credits** : 04
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

Digital Systems, (Combinational Sequential circuits): Number systems, binary, octal, hexadecimal number, binary arithmetic, one's and two's complement arithmetic, codes, error detecting and correcting codes, characteristics of digital ICs, examples of IC gates digital logic families-RTL, DTL, HTL, TTL, Schottky TTL, ECL, MOS logic, CMOS logic, interfacing CMOS and TTL, Tri-state logic, Representation of logical functions, K-map representation, simplification using K-map, Multiplexer, De-Multiplexer/Decoders, adders, popular MSI chips, digital comparator, parity checker /generator, code converters, priority encoders, decoder/drivers for display devices. Flip flops, S-R, J-K, T, D- flip flops, applications of flip-flops, counters, ring counter, ripple counters, synchronous counters, and applications of counters.

Fundamentals of 8085 Microprocessor: Architecture, block diagram, addressing modes, timing diagrams, state transition diagrams, classification of instructions, instruction set, assembly language programming, interrupt structure.

Data transfer schemes**:** Introduction to stack, subroutines, I/O Mapped I/O and memory mapped I/O, Synchronous and asynchronous data transfer schemes, memory interfacing, memory organization, address space, memory specification memory design using RAM and ROM etc.

Interfacing Peripherals and Applications: Study of common peripheral devices, their architecture, control words and control register & different modes of operation of PPI 8255, PIT 8253, USART 8251,PKBDC 8279 interface,8259 Programmable Interrupt Controller and interrupt Processing, real time systems

Data Conversion and Applications**:** ADC /DAC 0809,0808, architecture, interfacing with 8085 microprocessor. Microprocessor applications, frequency measurement, phase angle and power factor, measurement, current voltage measurement, KVA, KW and Maximum demand measurement, protection relays, microprocessor based speed control.

Introduction to EDA tools like VHDL, Microprocessor based development sytems, Simulators, Emulators and logic analyzers (Self Study -ISA)

Text Books:

1. Modern Digital Electronics by R.P.Jain, TMH, 4th, edition,2012.
2.Microprocessor Architecture, Programming, & Applications with 8085 by R.A. Gaonkar 3rd edition, Penram International Publication (India) Pvt. Ltd.1997.

References:

1. Fundamentals of Digital Circuits by Anand Kumar, PHI,1st,edition,2003.
2. Digital Electronics Principles by Malvino A.P, TMH,7th,2012.
3. Digital Integrated Electronics by Herbert Taub- Donald Schilling,TMH,3rd,1997.
4. Digital Design byM. Morris Mano, and Michael D Ciletti, Pearson LPE/5th editon Pearson
5. Digital Logic Design by B Holdsworth , TMH ,3rd Edition, 2000
6.Fundamentals of Microprocessors and Microcontrollers by B. Ram, Dhanpat Rai,4th,edition,1997.
7Microprocessor and Interfacing by Douglas V. Hall, TMH, 2 edition 2005

EE254 : POWER SYSTEM

Teaching Scheme : 03L + 00T, Total:03 **Credit :** 03
Examination Scheme: 15 ISE 1 + 15 ISE 2 + 10 ISA + 60 ESE **Total marks:** 100
Duration of ESE : 3 hrs

COURSE DESCRIPTION:

This course provides an introduction to generation transmission and distribution of power system. This course also provides introduction of different components of transmission system, concept and calculation of transmission line components .Course also provides knowledge of non convectional power plant, different parts and auxiliaries in power plants.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and electronics engineering and their concepts.

COURSE OBJECTIVES:

The objective of the course is to provide students with a firm grasp of the basic principles of generation of electrical power, power plant auxiliaries, transmission and distribution. This course will also help students to understand the concepts and terminologies which are used in generation and transmission systems. It is in-depth electrical course related to power generation systems.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1.apply basic knowledge of science and mathematics and understand various power generating plants.
2. understand the factors to be consider in site selection for different power plants in view of social, environmental and safety.
3. understand need and concept of different auxiliaries in power plants.
4. understand hydrology, load factor, load duration curves in view of economical considerations.
5. to familiarize with different transmission systems and their components.
6.do higher studies in generation planning, generation scheduling and load dispatch.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
PO-a	3	3	3	2	2	1
PO-b	3	2	2	2	2	1
PO-c	2	2	2	1	1	2
PO-d	2	3	3	1	1	2
PO-e	--	1	1	2	2	3

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE254 : POWER SYSTEM

Teaching Scheme : 03L + 00T, Total:03 **Credit :** 03
Examination Scheme : 15 ISE 1 + 15 ISE 2 + 10 ISA + 60 ESE **Total marks:** 100
Duration of ESE : 3 hrs

Review of Generating Plants: Hydro electric power plant, basic requirements, site selection schematic block diagram, principle of working, main components and auxiliary components of hydro electric power plant Thermal electric power plant basic requirements, site selection schematic block diagram, principle of working, main components and auxiliary components of thermal electric power plant. Nuclear power plant:, basic requirements, site selection schematic block diagram, principle of working, main components and auxiliary components of Nuclear electric power plant.

Economic Aspects and Load calculations: Classification of power plants, base load,peak load and intermediate load plants. Hydrograph, nature of hydrograph and its applications in power system. Flow duration curve, nature of flow duration curve and its applications in power system. Category of load curves, nature of load curve for domestic, commercial, industrial, agricultural, traction load duration curve, nature of load duration curve and its applications in power system. Load factor, meaning and its application in power system. Demand factor, Diversity factor, meaning and its application in power system, Plant capacity factor, plant use factor, meaning and its application in power system

Major electrical equipments in power plants, alternators, descriptive treatment of ratings of alternators, special features and field of use of alternators. Special features and field of use Transformers, descriptive treatment, ratings, special features and field of use bus bars : Descriptive treatment of ratings, special features and field of use exciters, and excitation systems, descriptive treatment of ratings, special features and field of use of transformers control panels, descriptive treatment of ratings, special features and field of use metering equipments in generating stations, descriptive treatment of ratings, special features and field of use control room equipments in generating stations, descriptive treatment of ratings, special features and field of use.

Transmission: 3 phase overhead transmission lines, importance of 3 phase overhead transmission lines in power systems. Factors to be considered while planning their layout, resistance, skin effect, concept of Inductance and its estimation, two-wire, single-phase, single and double circuit lines, with transposition and without transposition Inductance and its estimation, 3-wire-3-phase, single and double circuit lines, with transposition and without transposition Equal/unequal and horizontal spacing, circuit representation of lines. Classification of lines based on length as short, medium and long transmission lines representation of transmission line as tee circuit using R, L and C parameter, voltage and current relation of short and medium transmission line. Representation of transmission line as pie circuit using R, L and C parameter, voltage and current relation of short and medium transmission line.

Mechanical design: line supports for LV, HV and EHV, Sag calculation, stringing charts.

Text Books:

1. Elements of Power System Analysis William Stevenson,TMH,6th edition,2006
2. Modern Power System Analysis, J. Nagrath & D. P. Kothari Tata- Mc-Graw Hill Publishing Company, New Delhi Third Edition Reprint 2010.
3.Electrical power by Soni Gupta Bhatnagar, Dhanpat Rai, 4th,1997.

References:

1. Power System Analysis, Hadi Saadat McGraw Hill. -2003
2. Electrical Wiring, Estimation and Costing by S.L.Uppal, Khanna Publishers, New Delhi.
3. Principle of Power System by V.K.Mehta, S.Chand, New Delhi

EE255 : SIGNALS AND SYSTEMS

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This course provides an introduction to signals and systems. This course also provides introduction of classification of signals, time frequency characterization. Course also provides knowledge of sampling, DFT, random variables and processes.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic engineering mathematics and their concepts.

COURSE OBJECTIVES:

The objective of the course is to provide students with a firm grasp of the basic principles of signals and systems. This course will also help students to understand the concepts and applications of sampling, DFT, Z transform. The course also introduce to random variables and processes.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to
1.apply basic knowledge of signals and systems.
2. understand sampling principles
3. understand DFT and its applications
4. understand need and concept of Z transform
5. understand random variables and processes.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	1	2	2	2	2
PO-b	3	2	2	2	3
PO-c	2	3	3	3	3
PO-e	1	1	1	1	2
PO-f	1	2	2	2	2

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE255 : SIGNALS AND SYSTEMS

Teaching Scheme: 03L Total 03 **Credits** : 03
Examination Scheme: 15ISE1+ 15ISE2+ 10ISA+60ESE **Total Marks :** 100
Duration of ESE : 03 hrs

Classification of signals: Introduction to signals, Periodic & non periodic, analog and digital, deterministic and random, energy and power signals. Fourier analysis: Fourier series representation of periodic signals, Fourier transform and their properties, singularity function, impulse, step. Application of Fourier transform for analysis of LTI networks the concept of frequency in continuous and discrete time domain, linear time invariant system definition. Impulse response of LTI system. Introduction to Fourier series for discrete time periodic signals, discrete Fourier transform, DFT as a linear transformation, properties of DFT such as convolution, multiplication, duality.

Time and frequency characterization: Magnitude phase representation of Fourier transform, frequency response of LTI systems, time domain properties of ideal frequency selective filters, time domain and frequency domain aspects
of non ideal filters.

Sampling: Sampling theorem, reconstruction of signals from samples. Effect of sampling, continuous and discrete time signals, transformation of the independent variable. Continuous and discrete time systems. Basic system properties.

Introduction to Z transform: Region of convergence, properties of the Z transform, Inverse transform using counter integration, complex convolution theorem, Parseval's relation. Unilateral Z transform and its application to
difference equation with non zero initial condition.

Random variable and processes : Random variable, random processes. Correlation function (auto and cross) cumulative distribution function. Probability density function, joint cumulative and distribution and probability density.

Text Books

1.Signals and Systems by Haykin,Willey,2nd,edition,2013.
2.Signals and Systems : Analysis Using Transform Methods and MATLAB by Michael J. Roberts TMH 2003

Reference Books

1.Signals and Systems by A.V.Oppenphim, A.S.Willsky and S.H.Nawab, PHI,4th,1997..
2.Signal and system by B.P.Lathi Oxford university press, 1st,2010.
3.Signals and Systems by M J Roberts, TMHl,2nd,edition,2006.

SH 204 GENERAL PROFICEINCY-II

Teaching Schemes: 01 L + 02PR; Total: 03 **Credits:** 02
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks:** 50

COURSE DESCRIPTION:

This course is mainly designed to inculcate human skills among students community. It includes both soft skill development and human behavior at work. The student will learn the speaking, listening, drafting and presentation skills. Student will study the organization of meeting, GD/PI principles, general etiquettes & manners and organizational communication. This course will help to develop thinking ability, positive attitude, leadership ability, emotional competence and to perform well under varied circumstances.

DESIRABLE AWARENESS/SKILLS:

Basic principles of communication and English as a language.

COURSE OBJECTIVES:

The objectives of offering this course are
1. to strengthen the persona of student.
2. to learn use of concepts and applications of ICT based presentation skills.
3. to sharpen the soft skills to enhance employability.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to
1. apply basic knowledge of public speaking, listening and presentation skills
2. draft a document and write a technical/non-technical report.
3. demonstrate good etiquettes and manners in his/her life and face GD/PI confidently.
4. understand the organizational human behavior
5. use ICT based presentation.

RELEVANCE OF COS/POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-c	--	--	--	--	3
PO-e	1	2	3	3	2
PO-g	--	--	--	1	--
PO-h	1	1	3	2	3
PO-j	3	3	2	1	2
PO-k	2	2	1	2	1

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE204 : GENERAL PROFICIENCY-II

Teaching Scheme: 01 L+ 02P Total: 03 **Credits** : 02
Examination Scheme: 50 ICA **Total Marks :** 50

Organizational Communication:

Overview: Meaning, definition, classification, purpose and importance of communication; communication structure in organization, communication in conflict, crisis and cross-cultural setting; oral communication, reflection and empathy: two sides of effective oral communication; general etiquettes and manners; significance of body language in communication and assertiveness training.

Written Communication: Purpose of writing, clarity in writing, principles of effective writing, the 3x3 writing process for business communication, pre writing, writing, revising, specific writing features – coherence; technical report writing (IEEE standards).

Business Letters and Reports: Types of business letters, writing routine and persuasive letters, positive and negative messages; writing reports - purpose, kinds and objectives of reports; organization and preparing reports, short and long reports; writing proposals: structure & preparation; writing memos.

Group Communication: Meetings- planning, objectives, participants, timing, venue of meetings; meeting documentation: notice, agenda, agenda notes, book of enclosures and resolution & minutes of meeting.

Presentation skills: Elements of presentation – designing and delivering business presentations, advanced technological support for presentation, computer based power point presentation.

***Employment communication*:** Introduction, Composing Application, Writing CVs, Group discussions, Interview skills, do's and don'ts at GD/PI; technology-enabled communication - communication networks, intranet, internet, videoconferencing.

Organizational Behavior

Overview: Definition, historical development, fundamental principles of OB, contributing disciplines, challenges and opportunities.

Individual Behavior: Foundations of individual behavior. Ability: Intellectual abilities, Physical ability, the role of disabilities.

Personality: Meaning, formation, determinants, traits of personality, big five and MBTI, personality attributes influencing OB.

Attitude and Perception: Formation and components of attitudes, positive attitude, impact of attitude on behavior and decision making**.** Process of perception, factors influencing perception, link between perception and individual behavior/decision making.

Emotions: Affect, mood and emotion and their significance, basic emotions, emotional intelligence, emotional quotient, emotion management at individual and group level.

Motivation: Meaning and significance; theories of motivation-needs theory, two factor theory; application of motivational theories.

Leadership: Meaning, functions and styles of leadership; leadership theories - trait theory, behavioral theories, , path goal theory, charismatic leadership theory, situational theories-Fiedler's model; transactional and transformation leadership.

***Group Behavior*:** Definition, types, formation of groups, building effective teams; conflict**:** meaning, nature, types, process of conflict, conflict resolution.

Topics for Assignment /Practical

Minimum ten number of assignments/practical shall be performed to cover entire curriculum of the course. The list given below is just a guideline.

1. Speech preparation and delivery.
2. Power point presentation on general topics/ latest trends
3. Preparation of meeting agenda/ conducting meeting / taking minutes of meeting
4. Demonstration of general etiquettes and manners through role playing.
5. Demonstration of attitude/leadership etc through role playing.
6. Conducting mock meeting and preparing related documents.
7. Writing application letter along with resume
8. Reporting positive and negative information to seniors
9. Preparing notice/ circular/ memo/ enquiries/ quotations
10. Conducting group discussions and personnel interview
11. Report writing/Paper presentation.
12. Drafting policies/ procedures/ rules
13. Sharing experience to motivate others or to demonstrate mood /emotion and their significance.
14. Determination of emotion quotient/Intelligent quotient and personality analysis.

Text Books:

1. Business Communication for Managers, Penrose, Rasberry, Myers, 5th edition, Cenage Learning, 2007
2. Business Communication, Rai and Rai, 2nd edition, Himalaya Publishing House, 2014
3. Organization Behavior, Suja R. Nair, Himalaya Publications, 2014
4. Organization Behavior, V.S.P.Rao, 1st edition, Excel Publications, 2009

Reference Books:

1. Business Communication, Raman and Singh, 2nd edition, Oxford Publication, 2012
2. Business Communication Today, Bovee, Thill, 6th edition, Schatzman, Pearson Education, 2000
3. Business Communication (BCOM), Lehman Sinha, 2nd edition, Cengage Learning, 2012
4. Organization Behavior, Stephen P. Robbins, 13th edition, Pearson Education, 2009
5. Organization Behavior, Fred Luthans, 12th edition, TMH, 2012
6. Organization Behavior, K. Ashwathappa, 7th edition, Himalaya Publications, 2007

Note:

- **ICA –** Internal Continuous Assessment shall support for regular performance of practical/assignments and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student based on practical/assignments performed/completed by him/her. The performance shall be assessed experiment/assignment wise using internal continuous assessment format (S 10).
- **ESE –** The End Semester Exam for this course shall be based on one or more parameters among performance/oral examination/assignment etc to judge the skills acquired by student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

EE256 : ELECTRICAL WORKSHOP

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 50ICA **Total Marks :** 50

COURSE DESCRIPTION:

This course provides the basic practical knowledge about the electrical electronics engineering. The course includes the study of different electrical symbols, electrical shocks and safety precautions, equipments used for the measurement and testing of electrical and electronics devices, different types of electronic circuits, The course may includes visit to the electrical industries or power plant for the enhancement of practical knowledge.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and electronics engineering and their concepts.

COURSE OBJECTIVES:

The objective of the course is to provide knowledge about practical practices used in electrical engineering. This course will help students to use various tools for measurement and testing of electrical apparatus. The subject provides scope for practical applications of electrical engineering. The course will also help students to use and implement efficient and techno commercial aspect of maintenance and installation.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to
1.understand various electrical symbols and their use in electrical drawing.
2.familiar with the safety precautions and practices while working in industrial and domestic premises.
3.understand various maintenance schemes such as preventive, breakdown maintenance.
4. select correct size and type of cables and wires for different applications and use different types of measuring instrument and instrumentation and testing equipments.
5.select correct rating of fuse and MCB for protection scheme and safety.
6.discharge the professional duties in technical field of maintenance and installation.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
PO-a	3	3	3	3	3	1
PO-b	--	2	2	2	2	1
PO-c	--	3	1	1	1	2
PO-d	--	2	2	2	2	2
PO-e	--	--	3	3	3	2

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE:256 ELECTRICAL WORKSHOP

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 50ICA **Total Marks :** 50

The term work should include a minimum eight experiments. Practical's should be based on topics mentioned below. Practical should be explained with model and samples on each topic.

1. Study of different electrical symbols.
2. Electrical Shocks and safety precautions.
3. Study of different Cables: a. Classification of cable, Types of three Phase cable, b. Cable standards and specifications, Insulating materials for cables, Cable joining, d. Coaxial cable, twisted pair cable, Flat ribbon cable.
4. Study of different wires, a. Size selection of wires, b. Standard wires TRC and CTS wires c. Weather proof wires, Flexible wires.
5. Study of wiring accessories: a. Types of switches, b. Types of lamp holders, ceiling rose, mounting blocks, socket outlets plugs, wooden boards ,c. main switches (ICDP/ICTP/MCB), Junction boxes, Distribution boxes, fuse boards.
6. Selection of fuse & MCB.
7. Study and use of:
   a. DC/AC voltmeter and ammeter.
   b. Analog multi-meter and Digital multi-meter for the measurement of electrical quantities.
   c. Megger, Clip-on meter.
   d. Power factor meter.
8. Domestic wiring and Lamp circuits: a. Simple circuit, series and parallel circuit, b. Fluorescent lamp circuits, domestic switch board wiring.
9. **Industrial Visit:** Electrical power station, electrical substation, electrical workshop, electrical process industries (minimum two visits) and its reports.
   1. Design of Illumination Schemes for various applications i.e. domestic, commercial, service groups, agriculture
   2. Design and estimation, costing of electrification scheme for indoor workshop/ industry
   3. Estimation and costing of rural / urban area electrification(outdoor transformers, street lights , feeders and distributers

Note :
Guide lines for ICA: Internal Continuous Assessment shall support for regular performance of minimum 10 practical's and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practicals performed by student. The performance shall be assessed experiment wise using internal continuous assessment format (S10).

EE:257 DIGITAL ELECTRONICS AND MICROPROCESSOR LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 25ICA+25ESE **Total Marks :** 50
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

The practical course explores knowledge of digital electronics and microprocessor. The course comprises of architecture, assemble language programming and interfacing of peripherals and their applications.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and analog electronics principles and their concepts.

COURSE OBJECTIVES:

To meet the challenges of growing technology advancement, student will be conversant with the programmable aspect of digital electronics and microprocessor. To learn programming process of problem solving and communication in language of mnemonics. The object of practical course is to understand digital electronics and microprocessor demand, concept and develop skill in hardware and programming.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1. do hardwired logic system design.
2. know the pin configuration and memory organization of a typical microprocessor.
3. develop assemble language programming and interfacing peripherals for wide application in electrical engineering.
4. develop assembly language source code for applications that use I/O ports, timer and single/multiple interrupts
5. apply techniques for measurement of electrical quantities by microprocessor.
6. apply the knowledge of digital electronics and microprocessor in application of microprocessor based electrical protection system.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
PO-a	1	2	--	--	--	--
PO-b	2	3	3	3	3	3
PO-c	2	3	2	2	2	2
PO-d	2	2	2	2	2	2
PO-f	2	2	1	1	1	1

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE257 : DIGITAL ELECTRONICS AND MICROPROCESSOR LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 25ICA+25ESE **Total Marks :** 50
Duration of ESE : 03 hrs

The laboratory work should consist of performing minimum 10 experiments of the following based on theory syllabus of EE253 as per sample list given below. The term work should include a minimum ten experiments.

1. To study the operation of Logic Gates, Verification of Boolean Laws and D Morgan's theorem.
2. Realization of Combinational Circuits, Study of Arithmetic Circuits, Half Adder and Full Adder, Sub tractor, BCD Adder/ Subtractor.
3. Study of Flip Flops: S-R, J-K, D type, master slave J-K truth tables.
4. Study of Counters using IC's: Up down, Decade, Synchronous, Binary, BCD counter, Study of Ring Counter, Johnson Counter etc.
5. Study of architecture and instructions of 8085
6. Microprocessor 8085 assembly language programs based on data transfer, arithmetic instruction, logical instruction with 8/16 bit data
7. Microprocessor 8085 assembly language programs based on any interrupt.
8. Microprocessor 8085 assembly language programs based on SIM / RIM instructions
9. Interfacing of 8255 PPI with 8085
10. Interfacing of 8253 with 8085.
11. Interfacing of 8279 with 8085.
12. Applications of microprocessor 8085 in measurement of electrical quantity.
13. Applications of microprocessor 8085 in Electrical drives and speed control for stepper motor.
14. Introduction to EDA tools like VHDL etc and sample design

Note :
Guide lines for ICA: Internal Continuous Assessment shall support for regular performance of minimum 10 practical's and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practicals performed by student. The performance shall be assessed experiment wise using internal continuous assessment format (S10).

Guide lines for ESE: The end semester examination(ESE) for the laboratory course of three hrs duration, shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

EE258 : SIGNALS AND SYSTEMS LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 25ICA+25ESE **Total Marks :** 50
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This course provides an introduction to signals and systems. This course also provides introduction of classification of signals, time frequency characterization. Course also provides knowledge of sampling, DFT, random variables and processes.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic engineering mathematics and their concepts.

COURSE OBJECTIVES:

The objective of the course is to provide students with a firm grasp of the basic principles of signals and systems using matlab, labview etc. or any other open source, simulation software packages. This course will also help students to understand the concepts and applications of sampling, DFT, Z transform, simulation. The course also introduces random variables and processes simulations.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to use matlab, labview etc. or any other open source, simulation software packages for.

1. apply basic knowledge of signals and systems.
2. understand sampling principles
3. understand DFT and its applications
4. understand need and concept of Z transform
5. understand random variables and processes.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	1	2	2	2	2
PO-b	3	2	2	2	3
PO-c	2	3	3	3	3
PO-e	1	1	1	1	2
PO-f	1	2	2	2	2

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE258 : SIGNALS AND SYSTEMS LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 25ICA+25ESE **Total Marks :** 50
Duration of ESE : 03 hrs

The term work shall include minimum 10 experiments based on theory syllabus of EE255 signal and systems as per sample list given below, using MATLAB or equivalent MATCAD, LABVIEW etc application software packages. Sample list given below but any experiment related to signals and systems can be added

1. Signal representation
2. Sampling of signals
3. Laplace and Inverse laplace Transform
4. Time response of System
5. Fast Fourier Transform
6. Frequency response
7. Bode Plot
8. Root Locus
9. Z Transform and Inverse Z Transform
10. Realization of Systems
11. Low pass filter
12. High pass Filter
13. Filter Transformation
14. Butterworth approximation
15. Chebyshev approximation

Note :
Guide lines for ICA: Internal Continuous Assessment shall support for regular performance of minimum 10 practical's and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical's performed by student. The performance shall be assessed experiment wise using internal continuous assessment format (S10).

Guide lines for ESE: The end semester examination(ESE) for the laboratory course of three hrs duration, shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

EE259 : POWER SYSTEM LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 25ICA+25ESE **Total Marks :** 50
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This course provides an introduction to generation transmission & distribution of power system. This course also provides introduction of different components of transmission system, concept and calculation of transmission line components .Course also provides knowledge of non convectional power plant, different parts and auxiliaries in power plants.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and electronics engineering and their concepts.

COURSE OBJECTIVES:

The objective of the course is to provide practical exposure to students with a firm grasp of the basic principles of generation of electrical power, power plant auxiliaries, transmission and distribution. This course will also help students to understand the concepts and terminologies which are used in generation and transmission systems. It is in-depth electrical course related to power generation systems.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1.apply basic knowledge of science and mathematics and understand various power generating plants practically.
2. understand the factors to be consider in site selection for different power plants in view of social, environmental and safety.
3.understand hydrology, load factor, load duration curves in view of economical considerations.
4. familiarize with different transmission systems and their components.
5. do higher studies in generation planning, generation scheduling and load dispatch.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	3	3	3	2	2
PO-b	3	2	2	2	2
PO-c	2	2	2	1	1
PO-d	2	3	3	1	1
PO-e	--	1	1	2	2

1- Strongly correlated 2 – Moderately correlated 3 – Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE259 : POWER SYSTEM LAB

Teaching Scheme : 02P, Total: 02 **Credit :** 01
Evaluation Scheme : 25 ICA + 25 ESE **Total marks:** 50
Duration of ESE : 3 Hrs

The term work shall include minimum 10 experiments based on curriculum of course EE 254 Power System and EE204 Power Plant Engineering Experiments should involve performance/design/ drawing sheet of practical, result and conclusion based on it. The sample list given below is just a guide line.

Teacher should facilitate learning following lab experiments:

1. Layout of typical thermal power plant , hydro electrical, nuclear power
2. Layout of typical sub-station
3. Layout of various turbines in thermal power plant
4. Layout of various turbines in hydro electrical power plant
5. Layout of typical distribution of feeder in zone
6. Layout of typical transmission system with calculations
   To find the voltage and power at sending end and the voltage regulation of 3-phase (Short line approximation), To find the voltage and power at sending end and the voltage regulation of 3-phase (medium line :Nominal T /Pie representation), To find the voltage and power at sending end and the voltage regulation of 3-phase (long line: Exact solution)
7. Design and calculation of load factor, capacity factor for particular zone in city
8. Calculation the load duration for a zone.
9. To study the transmission line training simulator.
10. To study Ferranti effect.
11. Calculation of inductance of a single phase transmission line.
12. Calculation of inductance of a three phase double circuit transmission line.
13. Calculation of capacitance of single phase transmission line.
14. Calculation of capacitance of three phase a double circuit transmission line

Note :

Guide lines for ICA: Internal Continuous Assessment shall support for regular performance of minimum 10 practical's and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record/drawings submitted by student (journal) based on practical's performed by student. The performance shall be assessed experiment wise using internal continuous assessment format (S10).

Guide lines for ESE: The end semester examination(ESE) for the laboratory course of three hrs duration, shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

EE260 : ELECTRICAL MACHIES LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 25ICA+25ESE **Total Marks :** 50
Duration of ESE : 03 hrs

COURSE DESCRIPTION:

This course is an advanced level Electrical Machines-I which will further strengthen the knowledge of the students. The course explores on understanding of construction, basic principles underlying the operation of electrical machines, performance, characteristic and testing of AC Machines, Voltage regulation of synchronous alternator, parallel operation and salient features and characteristic of synchronous motor. It also gives the platform to understand construction, working, performance and application of three phase and single phase motors

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electrical and electronics engineering and their concepts.

COURSE OBJECTIVES:

The object of syllabus to impart the fundamental knowledge of Synchronous machines. Students will able to develop their ability to apply the specific procedures for comprehensive treatment of rotating machines. In the earlier stage the machine worked in isolation and its simple analysis was sufficient. Now the electric machines form an integral part of large system comprising of other components as well. The object is not great depth, but presentation through enough to give theory at a level that can be understood by undergraduate. With this beginning, the students will have the foundation to continue his education and able to do better in professional duties in the field of manufacturing, testing operation and control.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

2. apply basic knowledge of science and engineering to understand transformers and DC electrical machines.
3. understand construction, concepts, principles of operation, testing and application of special function motors.
4. understand the behavior of DC motors and analyze data for qualitative and quantitative parameters to determine characteristics of machines by performing practical.
5. perform professional duties in team of manufacturing, testing, operation and maintenance with the sense of safety precautions.
6. apply knowledge for technological subjects such as utilization of electrical energy, switch gear and machine design for economical and sustainable developments.

RELEVANCE OF COS /POS AND STRENGTH OF CO-RELATION:

PO/CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-a	1	1	1	3	2
PO-b	1	1	1	3	2
PO-c	3	3	3	3	2
PO-d	2	2	2	3	2
PO-f	3	3	3	3	2

1- Strongly correlated 2 – Moderately correlated 3–Weakly correlated

COURSE CONTENT (ON NEXT PAGE)

EE260 : ELECTRICAL MACHINES LAB

Teaching Scheme: 02P Total 02 **Credits** : 01
Examination Scheme: 25ICA+25ESE **Total Marks :** 50
Duration of ESE : 03 hrs

The laboratory work should consist of performing minimum 10 experiments of the following based on theory syllabus of EE251 and EE252 as per sample list given below. Experiments should involve simulation performance/design of practical, result and conclusion based on it. The sample list given below is just a guide line.

List of Experiments:

1. Simulations based on electromagnetic fundamentals(minimum 3)
2. Open circuit and short circuit test on single phase transformer to find its core loss, full load copper loss and constants of its equivalent circuit
3. Load test on single-phase and three-phase transformer
4. Parallel operation of two single-phase transformers under various conditions.
5. V-connection of identical single-phase transformers for obtaining three phase transformation.
6. Verification of Scott-connection of single-phase transformer.
7. Verification and analysis of no load current waveform of single-phase transformer.
8. Separation of transformer core loss
9. Determination of magnetization, external and internal characteristics of a D.C. shunt generator.
10. Speed control of a D.C. Shunt motor by- (i) armature voltage control and (ii) Field current control method.
11. Load and break test on D.C. shunt motor.
12. Determination of efficiency of a D.C. shunt or compound machine by performing Swinburn's test

Note :
Guide lines for ICA: Internal Continuous Assessment shall support for regular performance of minimum 10 practical's and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical's performed by student. The performance shall be assessed experiment wise using internal continuous assessment format (S10).

Guide lines for ESE: The end semester examination(ESE) for the laboratory course of three hrs duration, shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

B.Tech Electrical Engineering

Programmes Outcomes

a)Graduates will demonstrate knowledge of mathematics, science and engineering

b)Graduates will demonstrate the ability to identify, formulate and solve engineering problems

c)Graduate will demonstrate the ability to design and conduct experiments, analyze and interpret data

d)Graduates will demonstrate the ability to design a system, component or process as per needs and specifications

e)Graduates will demonstrate the ability to visualize and work on laboratory and multi-disciplinary tasks

f)Graduate will demonstrate the skills to use modern engineering tools, software's and equipment to analyze problems

g)Graduates will demonstrate the knowledge of professional and ethical responsibilities

h)Graduate will be able to communicate effectively in both verbal and written form

i)Graduate will show the understanding of impact of engineering solutions on the society and also will be aware of contemporary issues

j)Graduate will develop confidence for self education and ability for life-long learning

k)Graduate will show the ability to participate and try to succeed in competitive examinations

GOVERNMENT COLLEGE OF ENGINEERING, JALGAON
(An Autonomous Institute of Government of Maharashtra)
"Globally Accepted Engineers with Human Skills''
National Highway No.06, JALGAON 425 002
Ph.0257-2281522 Fax-0257-2281319
Email-princoej@rediffmail.com Web : www.gcoej.ac.in
OW.NO.GCOEJ/EED/ 2015/ Date :

Equivalence and/or exemption in course in autonomous curriculum if passed the courses from NMU, Jalgaon curriculum

Sr. No	Course as per autonomous curriculum in which exemption shall be granted (Course code and Name)		Exempted if passed as per NMU, Jalgaon examination (Paper No. and Subject code)		Sign of concern HoD/BoS chairperson
1	SH 201	Engineering Mathematics III	163101	Engineering Mathematics III(Th)	
2	EE201	Electronic Devices and Linear Integrated Circuits	164111	Analog and Digital Electronic(Th)	
3	EE202	Electrical Circuit Analysis	164112	Network Analysis(Th)	
4	EE203	Electrical and Electronic Measurements	163103	Electrical measurement – I (Th)	
5	EE204	Power Plant Engineering	163102	Power Plant Engineering(Th)	
6	SH204	General Proficiency Skill-II	163306	No Equivalence and hence no exemption (i.e. each student who is shifted from NMU, Jalgaon curriculum in to autonomous curriculum shall register and pass this course.) Soft Skill-III(Lab)*	
7	EE205	Electronic Devices and Linear Integrated Circuits Lab	164317	Analog and Digital Electronic(Lab)	
8	EE206	Circuit Simulation Lab	165310	Software Application- I	
9	EE207	Electrical Circuit Analysis Lab	164318	Network Analysis(Lab)	
10	EE208	Electrical and Electronic Measurements Lab	163309	Electrical measurement – I (Lab)	
11	EE209	Electrical and Electronic Material Lab	163310	Electrical and Electronic Material (Lab)	
12	EE251	Electromagnetic Fields		No Equivalence and hence no exemption (i.e. each student who is shifted from NMU, Jalgaon curriculum in to autonomous curriculum shall register and pass	

			165104	this course.) Electromagnetic Engineering(Th)*	
13	EE252	Fundamentals of Electric Machinery	163113	Electrical Machines – I (Th)	
14	EE253	Digital Electronics and Microprocessors	166115	No Equivalence and hence no exemption (i.e. each student who is shifted from NMU, Jalgaon curriculum in to autonomous curriculum shall register and pass this course.) Microprocessor and Microcontroller(Th)*	
15	EE254	Power System - I	163104	Power System – I (Th)	
16	EE255	Signals and Systems	164115	Numerical Techniques(Th)	
17	EE256	Electrical workshop	163308	Electrical workshop (Lab)	
18	EE257	Digital Electronics and Microprocessor (Lab)	166319	No Equivalence and hence no exemption (i.e. each student who is shifted from NMU, Jalgaon curriculum in to autonomous curriculum shall register and pass this course.) Microprocessor and Microcontroller(LAB)	
19	EE258	Signals and Systems (Lab)	164316	C-Programming/ MATLAB(Lab)	
20	EE259	Power Systems-I (Lab)	163307	Power plant Engineering(Lab)	
21	EE260	Electrical Machines -I (Lab)	164319	Electrical Machines – I (Lab)	
22	EE261	Mini Projects-I	166321	Minor Project	

Important Notes:

1. If any student was admitted in second year (Electrical) before the academic year 2015-16 and his/her odd semester (I^{st} semester) was granted under NMU, Jalgaon curriculum but even semester (II^{nd} semester) was not granted then such student shall be shifted in autonomous curriculum for even semester (II^{nd} semester) of the academic year 2015-16 or onward. He/she shall pass all the courses of odd semester (I^{st} semester) as per NMU, Jalgaon curriculum, if not. In addition; he/she shall register and pass all other courses of autonomous curriculum for which exemption is not granted as per above chart during even semester (II^{nd} semester) or whenever institute offers that subject.
   In any case; any student shall not be declared as pass in S.Y.B.Tech.(Electrical) without obtaining exemption or passing all courses of S.Y.B.Tech. (Electrical) as per above chart.

2. If any student who was admitted in second year engineering (Electrical) before the academic year 2015-16 and failed second year engineering as per NMU, Jalgaon curriculum shall pass all the courses of second year engineering as per NMU, Jalgaon curriculum. Such student shall be eligible to take admission in T. Y. B. Tech. for the academic year 2016-17 or onward if his/her result is pass/ATKT as per NMU, Jalgaon result. In addition; he/she shall register and pass all the courses of S.Y.B.Tech. of autonomous curriculum for which exemption cannot be granted as per above chart; during the academic year of T.Y.B.Tech. or whenever institute offers that course.
   To pass all such courses shall be the mandatory condition for the award of degree.

3. The students who are directly admitted to S.Y. B. Tech. (Electrical) after diploma in engineering (Electrical or equivalent discipline) shall register and pass the courses SH 155 General Proficiency and SH 153 Environmental Studies. In addition; any student who is directly admitted to S.Y. B. Tech. (Electrical) after diploma in engineering (Non Electrical or equivalent discipline) shall register and pass the courses SH 155 General Proficiency, SH 153 Environmental Studies, ET 151 Basic Electrical Engineering and ET 152 Basic Electrical Engineering Lab. All such students shall register and pass all above courses during the academic year of S.Y.B.Tech. or whenever institute offers those courses.
   To pass all such courses shall be the mandatory condition for the award of degree.

4. *The students who are likely to be admitted to T.Y. B.Tech.(Electrical) in academic year 2016-17 directly who were admitted to T.E.(Electrical)in the year 2015-16 or before as per N.M.U. Curriculum but failed or detained in any semester , shall register and pass SH204 General Proficiency Skill-II, EE251 Electromagnetic Fields,EE253 Digital Electronics and Microprocessors and EE257 Digital Electronics and Microprocessors Lab corces in addition if he/she has not passed the equivalent subjects as per N.M.U. curriculum specified in the above chart.
   To pass all such courses shall be the mandatory condition for the award of degree.