(A)B. Tech. Electrical Engg.& (B) B.Tech. Electrical & Electronics Engg.

Scheme of Studies/ Examination

Common Scheme for both branches (EE& EEE).

Semester III (w.e.f. session 2016-2017, K.U.K.)

S. N.	Course Code	Course Title	Teaching Schedule				Allotment of Marks				Dur. of Exam (Hrs)
			L	T	P	Hrs/Week	Theory	Sessional	Practical	Total	
1	AS-201N	Mathematics-III	3	1		4	75	25		100	3
2	EE-201N	Electronic Devices & Circuits	4	0		4	75	25		100	3
3	EE-203N	Network Analysis & Synthesis	3	1		4	75	25		100	3
4	EE-205N	Electrical Machines- I	4	1		5	75	25		100	3
5	EE-207N	Electrical Power Generation	3	0		3	75	25		100	3
6	EE-209N	Communication Systems	4	0		4	75	25		100	3
7	EE-211N	Electronic Devices & Circuits Lab			2	2		25	25	50	3
8	EE-213N	Electrical Machines -I Lab			2	2		50	50	100	3
9	EE-215N	Communication Systems Lab			2	2		25	25	50	3
10	EE-217N	Electrical Workshop			2	2		50	50	100	3
11	MPC-202N	Energy Studies*	3			3	75*	25*		100*	3
		Grand Total	24	3	8	35	450	300	150	900	

***** Energy Studies a mandatory course and student has to get passing marks in order to qualify for the award of degree but its marks will not be added in the grand total.

Common Scheme for both branches (EE& EEE).

Semester IV(w.e.f. session 2016-2017, K.U.K.)

S. N.	Course No.	Course Title	Teaching Schedule				Allotment of Marks				Dur.of Exam (Hrs)
			L	T	P	Hrs/Week	Theory	Sessional	Practical	Total	
1	HS-201N	Fundamentals of Management	3	1		4	75	25		100	3
2	EE-202N	Digital Electronics	4	0		4	75	25		100	3
3	EE-204N	Electrical Measurements & Measuring Instruments	3	1		4	75	25		100	3
4	EE-206N	Signals & Systems	3	1		4	75	25		100	3
5	EE-208N	Electrical Machines-II	4	1		5	75	25		100	3
6	EE-210N	Electrical Engineering Materials & Processes	3	0		3	75	25		100	3
7	EE-212N	Digital Electronics Lab			2	2		25	25	50	3
8	EE-214N	Instrumentation Lab			2	2		50	50	100	3
9	EE-216N	Signals & Systems Lab			2	2		25	25	50	3
10	EE-218N	Electrical Machines-II Lab			2	2		50	50	100	3
11	MPC-201N	Environmental Studies*	3			3	75*	25*		100*	3
		Grand total	23	4	8	35	450	300	150	900	

***** Environmental Studies is a mandatory course and student has to get passing marks in order to qualify for the award of degree, but its marks will not be added in the grand total.

Note: All the students have to undergo six weeks industrial training after IV sem and it will be evaluated in V sem.

AS-201 N Mathematics-III

Lecture Tutorial Practical Major Test Minor Test Total Time
3 1 - 75 25 3H

Purpose To provide the conceptual knowledge of Engineering mathematics
Course Outcomes
CO 1 To study various fundamental concepts of Fourier series and Fourier Transformation.
CO 2 To study and understand the functions of a complex variables.
CO 3 To study the Probability Distributions.
CO 4 To study the linear programming problem formulation.

UNIT – I

Fourier Series : Euler's Formulae, Conditions for Fourier expansions, Fourier expansion of functionshaving points of discontinuity, change of interval, Odd & even functions, Half-range series.
Fourier Transforms : Fourier integrals, Fourier transforms, Fourier cosine and sine transforms.
Properties of Fourier transforms, Convolution theorem, Perseval's identity, Relation between Fourierand Laplace transforms, Fourier transforms of the derivatives of a function, Application to boundary value problems.

UNIT-II

Functions of a Complex Variables : Functions of a complex variable, Exponential function, Trigonometric, Hyperbolic and Logarithmic functions, limit and continuity of a function, Differentiability and analyticity.
Cauchy-Riemann equations, Necessary and sufficient conditions for a function to be analytic, Polar form of the Cauchy-Riemann equations, Harmonic functions, Application to flow problems, Conformal transformation, Standard transformations (Translation, Magnification &rotation, inversion & reflection, Bilinear).

UNIT-III

Probability Distributions : Probability, Baye's theorem, Discrete & Continuous probability distributions, Moment generating function, Probability generating function, Properties and applications of Binomial, Poisson and normal distributions.

UNIT-IV

Linear Programming : Linear programming problems formulation, Solution of Linear Programming Problem using Graphical method, Simplex Method, Dual-Simplex Method.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

Text Book

1. Higher Engg.Mathematics : B.S. Grewal
2. Advanced Engg.Mathematics : E. Kreyzig

Reference Book

1. Complex variables and Applications : R.V. Churchil; Mc. Graw Hill
2. Engg. Mathematics Vol. II: S.S. Sastry; Prentice Hall of India.
3. Operation Research : H.A. Taha.
4. Probability and Statistics for Engineer : Johnson. PHI.

EE-201N	Electronic Devices & Circuits					
Lecture	Tutorial	Practical	Theory	Sessional	Total	Time
4	0	0	75	25	100	3 Hr.
Course Outcomes						
CO1	Basics of various types of Semiconductor elements, Regulated power supply					
CO2	Model of Low & High frequency transistors, Opto-Electronics Devices					
CO3	Various types of Amplifiers, their frequency response, Power Amplifiers & applications					
CO4	Feedback Amplifiers, noise reduction, various types of Oscillators					

Unit-I

Semiconductors:
Band structure of semiconductor, Electron & hole distribution, current transport in semiconductor & concept about mobility, Diffusion & recombination, continuity equation & its solution, Hall effect.Types of P-N junction diodes: Tunnel, Zener, Shockley, Schottky, Varactor diode, Clipper & clamper ckts. (Structure & Characterstics only).

Regulated Power Supplies:
Series and shunt voltage regulators, power supply parameters, three terminals I.C. regulators, SMPS.

Unit-II

Low & High Frequency Transistors Model:
Transistor hybrid model, h-parameter of equivalent circuit of transistor, Analysis of transistor amplifier using h-parameters in CB, CE & CC.

Basics of Opto-Electronics:
Photo-diodes, photo transistor, P-N Junction solar cells, LED, laser and photovoltaic device.

Unit-III

Amplifiers:
Small signal amplifier and mathematical analysis, RC coupled, transformer coupled, direct coupled amplifier and their frequency response, Wide band amplifier, tuned amplifier,

Power amplifiers:
Class A, class B and class C amplifier, Calculation of efficiency and harmonic distortion, push pull amplifier and application of power amplifier.

Unit-IV

Feed Back amplifiers:
Concept of +ve&-ve feedback, overall gain, advantage of –ve feedback , voltage & current feedback, series and shunt feedback, effect of feedback on frequency response and bandwidth, noise reduction using -ve feedback, effect on I/P & O/P characteristics.

Oscillators:
Barkhausen criteria, Oscillators: Wein Bridge, RC phase shift, Colpitts& Hartley oscillators, Multivibrators using transistor, crystal oscillator.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

REFERENCES:

1. Integrated Electronics; Miliman & Halkias; McGraw Hill.
2. Electronic circuit analysis and design (Second Ed.) D.A.V Neamen: TMH.
3. Electronics Principles: Malvino: McGraw Hill.
4. Electronics Circuits: Donald L. Schilling & Charles Belove, McGraw Hill.
5. Electronics Devices & Circuits: Boylested & Nashelsky, Pearson.

EE-203N	Network Analysis and Synthesis					
Lecture	Tutorial	Practical	Theory	Sessional	Total	Time
3	1	0	75	25	100	3 Hr.
Purpose	To familiarize the students with the concepts of topology, transient analysis, network modeling, filters and methods of network analysis and synthesis for solving simple and complex circuits.					
Course Outcomes						
CO1	To understand the concept of N/W topologies and network analysis using graph theory.					
CO2	To understand various parameters of two port networks& their relationship					
CO3	To understand types , classification & design of filters					
CO4	To understand the concept of synthesis of one port network.					

UNIT-I

NETWORK FUNCTIONS & GRAPH THEORY: Terminal pairs or Ports, Network functions forone-port and two-port networks, concept of poles and zeros in Network functions, Restrictions on pole and zero .Locations for driving point functions and transfer functions, Time domain behaviour from the pole-zero plot. Principles of network topology, graph matrices, network analysis using graph theory.

UNIT-II

TWO PORT NETWORKS: Characteristics and Parameters of two port networks**,** Network Configurations**,** short circuit Admittance parameters, open-circuit impedance parameters, Transmission parameters, hybrid parameters, condition for reciprocity & symmetry of two-port networks in different parameters representations. Inter-relationships between parameters of two-port network sets, Expression of input & output impedances in terms of two port parameters, Inter-connection of two port networks, analysis of typical two-port networks, image impedances.

UNIT-III

FILTERS: Types of filters and their characteristics**,** Filter fundamentals, classification of Filters, Analysis& design of prototype high-pass, prototype low-pass, prototype band-pass, and prototype band-reject Filter, m-derived low-pass & high -pass filters, low -pass filter and high-pass filter with RC & RL circuits, Band pass filter with RLC circuit.

UNIT-IV

NETWORK SYNTHESIS: Hurwitz polynomials**,** Properties of Hurwitz polynomials**,** Positive real functions, procedure of testing of PR functions, concept and procedure of network synthesis, properties of expressions of driving point immitances of LC networks. LC Network synthesis: Foster's I & II Form, Cauer's I & II form, RC & RL Network.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

REFERENCES:

1. Network Theory Analysis & Synthesis: Smarajit Ghosh; PHI.
2.Network Analysis & Synthesis: F.F. Kuo; John Wiley & Sons Inc.
3. Circuit Theory, A.Chakarbarti, DhanpatRai
4.Introduction to modern Network Synthesis: Van Valkenburg; John Wiley.
5.Network Analysis: Van Valkenburg; PHI.
6.Networks and Systems: D.Roy Choudhury; New Age International.

EE-205N	Electrical Machines-I					
Lecture	Tutorial	Practical	Theory	Sessional	Total	Time
4	1	0	75	25	100	3 Hr.
Course Outcomes						
CO1	To understand concept ,working, operation, maintenance of single phase transformer					
CO2	To understand concept ,working, operation, maintenance of three phase transformer & conversion from three phase to multiple phases					
CO3	To understand construction ,working, operation of D.C. Generator					
CO4	To understand concept ,working, operation, testing of D.C. Motor					

UNIT – I

TRANSFORMERS: Principle, construction of core, e.m.f. equation, winding &tank, cooling, operation, testing of single phase transformer, equivalent circuit, phasor diagram, parameters determination, P.U representation of parameters, regulation, losses & efficiency, separation of iron losses, parallel operation,all-day efficiency, Sumpner's test, specificationsof transformer, maintenance of transformer, difference between power transformer and distribution transformer.

UNIT – II

Three phasetransformer: Types and their comparative features, Zig-zag connection.
Auto-Transformer: Principle, construction, comparison with two winding transformers, applications.
Nature of magnetizing current: plotting of magnetizing current from B-H curve, inrush current.
Phase-Conversion: Three to two phase, three to six phase and three to twelve phase conversions. Introduction to three windings transformer, tap-changing & phase- shifting transformers.
Instrument transformer: Current transformer, Potential transformer.

UNIT – III

D.C. Generator-Principle & construction of D.C. generator, simplex lap,wave winding, E.M.F. equation, types, voltage build up, armature reaction, compensating winding, function of commutator, methods of improving commutation, load characteristics, parallel operation.
Excitation System—Purpose and requirements of excitation system, brushless excitation system.

UNIT- IV

D.C. Motor-Principle of DC motors, function of commutator in DC motors, torque and output power equations, load characteristics, losses, starting, starters, speed control, braking, testing ,Swinburne test, Hopkinson test, Ward Leonard Method, efficiency& applications.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

REFERENCES:

1. Electrical Machines: I.J. Nagrath and D.P. Kothari, TMH, New Dehli.
2. Performance & Design of DC Machines: A.E Clayton & N.N Hancock; ELBS.
3. Electric Machinery, Fitzerald & Kingsley, MGH.
4. Theory of alternating current machinery, A.S Langsdorf, TMH.
5. Electrical Machines, P.S. Bhimbra, Khanna Pub. Delhi.
6. Electrical Machines: Ashfaq Husain, Dhanpat Rai& company

EE-207 N	Electrical Power Generation					
Lecture	Tutorial	Practical	Theory	Sessional	Total	Time
3	0		75	25	100	3 Hr.
Course Outcomes						
CO1	To study, Load and loading forecasting, Power plant economics, Tariffs and power factor improvement used in power generation					
CO2	To understand working of Thermal power plants, Hydro power plants					
CO3	(a)To understand working of Nuclear power plants ,Diesel power plants (b)Combined working of thermal& hydel plants.					
CO4	To make conversant with Non Conventional Energy Sources:					

Unit – I

Load and Load Forecasting:

Load curves, maximum demand, load factor, diversity factor, capacity factor, utilization factor, types of load, load forecasting, base load and peak load.

Power Plant Economics:

Choice of type of generation, size of generator and number of units, cost of electrical energy, depreciation of plant, effect of load factor on cost of Electrical Energy.

Tariffs and Power Factor Improvement:

Different types of tariffs and methods of power factor improvement.

Unit-II

Thermal Power Plants:

Choice of site,lay out, fuel-gas flow diagram, water steam flow diagram, working of power plants and their layout, characteristics of turbo generators.

Hydro power plants:

Choice of site, classification of hydro electric plants, main parts and working of plants and their layouts, characteristics of hydro electric generators.

Speed governing—Purpose, hydraulic type governor functioning

Unit-III

Nuclear power plants:

Choice of site, classification of plants, main parts, layout and their working, associated problems.

Diesel Power Plants:

Diesel plant equipments, diesel plant layout and their working, application of diesel plants.

Combined working of plants:

Advantages of combined operation plant requirements of base load and peak load operation. Combined working of run-off river plant and steam plant.

Unit-IV

Introduction to Non-Conventional Energy Sources: Elementery idea of power generation by Wind, Solar, Ocean, and Geothermal sources of energy, fuel cell, biomass.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

REFERENCES:

1. C.L. Wadhwa, "Electric Power System" (Willey Eastern Ltd).
2. I.J. Nagnath and D.P. Kothari "Power System Engineering" TMGH.
3. Power Genreation by B.R Gupta, S.Chand.
4. Power System Engg. By R.K Rajput, Luxmi Publication.

EE-209N	Communication Systems					
Lecture	Tutorial	Practical	Theory	Sessional	Total	Time
4	0	0	75	25	100	3 Hr.
Course Outcomes						
CO1	Basics of communication & noise generation					
CO2	Amplitude modulation, concept of SSB waves & DSBSC,VSB Modulation					
CO3	Concept of TDM, FDM, PAMand Digital communication					
CO4	Concept of Pulse code modulation, differential pulse code modulation,Digital modulation Techniques					

Unit-I

Introduction to Communication Systems:
The essentials of a communication system, modes and media's of communication, introduction to wired and wireless media, classification of signals and systems, Fourier Analysis of signals.

Introduction to noise:
External noise, internal noise, S/N ratio, noise figure.

Unit-II

Amplitude modulation:
Amplitude modulation , generation of AM waves, Frequency Spectrum, Demodulation of AM waves, DSBSC, generation of DSBSC waves, single side band modulation, generation of SSB waves, demodulation of SSB waves, vestigial sideband modulation (VSB)

Angle modulation:
Basic definition, Introduction to phase modulation (PM) & frequency modulation (FM) multiplexing,

Unit-III

Pulse Modulation:
Sampling theorem &aliasing.Time division (TDM) and frequency division (FDM) multiplexing, pulse amplitude modulation (PAM), pulse width modulation (PWM). Pulse Position Modulation (PPM)

Elements of Digital Communication System:
Block diagram of digital communication system, digital representation of analog system, Advantage & disadvantage of digital communication,

Unit-IV

Pulse Digital Modulation:
Elements of pulse code modulation, noise in PCM systems, measure of information, channel capacity, channel capacity of a PCM system, differential pulse code modulation (DPCM). Delta modulation (DM).

Digital modulation techniques: ASK, FSK, BPSK, QPSK, M-ary PSK.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

REFERENCES :

1.CommunicationSystems (4thedn.): Simon Haykins, John Willey & sons.
2. Communication Systems: Singh &Sapre, TMH.
3. Electronic Communication Systems: Kennedy, TMH.
4. Communication Electronics: Frenzel, TMH.
5.Communication Systems: Taub& Schilling, TMH

EE-211N	Electronic Devices Ckt. Lab					
Lecture	Tutorial	Practical	External	Sessional	Total	Exam Time
		2	25	25	50	3 Hr.

LIST OF EXPERIMENTS:

1. To experimentally draw the reverse breakdown characteristics of Zener diode as a voltage regulator.
2. To draw the input and output characteristics of a given transistor in common emitter configuration.
3. To measure ac ripple factor of half wave rectifier, full wave rectifier & bridge rectifier and effect of different filter circuits at different loads.
4. To measure h- parameters of given transistorin common emitter configuration at 1 KHz.
5. To draw characteristics of photo diode & LED.
6. To draw characteristics of opto-coupler.
7. To draw characteristics of Varactor diode.
8. To determine voltage gain, power gain & freq. responseof Transformer coupled amplifier.
9. To study Hartley Oscillator.
10. To study the different types of negative feedback in two stage amplifier and to observe its effects upon the amplifier parameters.

Note: At least ten experiments are to be performed; at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus.

EE-213N			Electrical Machine-I Lab			
Lecture	Tutorial	Practical	External	Sessional	Total	Exam Time
0	0	2	50	50	100	3 Hr.

LIST OF EXPERIMENTS:

1. To find turns ratio, polarity & mark dot convention of a 1-phase transformer.
2. To perform open & short circuit tests on a 1-phase transformer& find parameters.
3. To perform Sumpner's Back to Back test on 1-phase transformer& find parameters.
4. Parallel operation of two 1-phase transformers and observe load sharing.
5. To convert three phase supply to 2-phase by Scott-connection, compare line currents theoretically& practically for unbalanced load.
6. To perform load test on DC shunt generator & find efficiency& observe speed at different load.
7. Speed control of DC shunt motor by armature & field control method, draw graph between speed & field current.
8. To perform Swinburne's test of DC shunts motor and find efficiency.
9. To perform Hopkinson's test of DC shunts M/Cs.
10. To perform Ward Leonard method for speed control DC shunts motor.
11. To make various types of three phase connections ,using three single phase transformers, study relevant features
12. Characteristics for compound, series shunt generators.

Note: At least ten experiments are to be performed; at least eight experiments should be performed from above list. Remaining two experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus.

EE-215 N	Communication Systems lab					
Lecture	**Tutorial**	**Practical**	**External**	**Sessional**	**Total**	**Exam Time**
0	**0**	**2**	**25**	**25**	**50**	**3 Hr.**

LIST OF EXPERIMENTS:

1. To observe sampling theorem waveforms on CRO.
2. To observe AM Modulation/Demodulation waveforms on CRO.
3. To observe FM Modulation / Demodulation on CRO.
4. To observe PAM Modulation / Demodulation waveforms on CRO.
5. To observe Delta Adaptive Modulation / Demodulation waveforms on CRO.
6. To observe PCM Modulation / Demodulation waveforms on CRO.
7. To observe Carrier Modulation technique using ASK on CRO.
8. To observe Carrier Modulation technique using FSK on CRO.
9. To observe Carrier Modulation technique using PSK on CRO.
10. Comparative study of Delta Modulation & Adaptive Delta Modulation Technique on CRO.
11. To observe Time Division Multiplexing & De-multiplexing on CRO.

Note: At least ten experiments are to be performed; at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus.

EE-217N	Electrical Workshop					
Lecture	Tutorial	Practical	External	Sessional	Total	Exam Time
0	0	2	50	50	100	3 Hr.

LIST OF EXPERIMENTS:

1. Introduction of tools, electrical materials, symbols, and abbreviations.
2. a) To make connections of stair case wiring.
   b) To carry out house wiring using battens, cleat, casing-capping, and conduit wiring.
3. To make connections of high pressure mercury vapour lamp (H.P.M.V) and Sodium vapour lamp and study the performance.
4. Repairing of home appliances such as heater, electric iron, fans, fluorescent tube light etc.
5. To study construction of moving iron, moving coil, electrodynamics & induction type meters.
6. To design & fabricate single phase transformer.
7. To study fuses, relays, contactors, MCBs, and circuit breakers.
8. Insulation testing of electrical equipments with the help of megger.
9. To design, fabricate a PCB for a circuit, wire-up and test.
10. To study electrical Drawing of a building and prepare drawing of workshop lab.
11. a) To make connections of house hold wiring from main- using color code for phase ,earth, neutral

b) Testing of earth wire, earthing and phase wire in house hold wiring.

12. Measurement of frequency, phase angle, voltage with the help CRO and function generator.

Note: At least ten experiments are to be performed; at least eight experiments should be performed from above list. Remaining two experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus.

MPC-202NENERGY STUDIES

L	T	P
3	-	-

Sessional: 25 Marks
Exam: 75 Marks
Total: 100 Marks
Time: 3 hrs

UNIT-I

Introduction: Types of energy, Conversion of various forms of energy, Conventional and Nonconventional sources, Need for Non-Conventional Energy based power generation.
Energy Management: General Principles of Energy Management, Energy Management Strategy.
Energy Audit & Tariffs: Need, Types, Methodology and Approach.

UNIT-II

Conventional Energy sources: Selection of site**,** working of Thermal, Hydro, Nuclear and Diesel power plants and their schematic diagrams & their comparative advantages- disadvantages.

UNIT-III

Non Conventional Energy sources: Basic principle, site selection and power plant layout of Solar energy, photovoltaic technologies, PV Systems and their components, power plant layout of Wind energy, layout of Bio energy plants ,Geothermal energy plants and tidal energy plants.

UNIT-IV

Energy Scenario: Lay out of power system, Role of Energy in Economic development, energy demand, availability and consumption, Commercial and Non-commercial energy, Indian energy scenario, long term energy scenario, energy pricing, energy sector reforms in India, energy strategy for the future.
Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.
Suggested Text Books & References:

1. Energy Studies-Wiley and Dream tech India
2. Soni, Gupta, Bhatnagar: Electrical Power Systems – Dhanpat Rai& Sons
3. NEDCAP: Non Conventional Energy Guide Lines
4. G.D. Roy: Non conventional energy sources
5. B H Khan: Non Conventional energy resources - - McGraw Hill
6. Meinel A B and Meinal M P,Addison :Applied Solar Energy- Wesley Publications
7. George Sutton: Direct Energy Conversion - McGraw Hill

HS-201 N Fundamentals of Management

Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	1		75	25		3H

Purpose To make the students conversant with the basics concepts in management thereby leading to nurturing their managerial skills
COURSE OUTCOMES
CO1 An overview about management as a discipline and its evolution
CO2 Understand the concept and importance of planning and organizing in an organization
CO3 Enabling the students to know about the importance of hiring and guiding the workforce by understanding the concept of leadership and communication in detail
CO4 To understand the concept and techniques of controlling and new trends in management

UNIT-1

Introduction to Management: Meaning, Definition, nature, importance & Functions, Management as Art, Science & Profession-Management as social System, Concepts of management-Administration

Evolution of Management Thought: Development of Management Thought-Scientific management, Administrative Theory of Management, Bureaucratic Organization, Behavioral approach (Neo Classical Theory): Human Relations Movement; Behavioral Science approach; Modern approach to management –Systems approach and contingency approach.

UNIT-II

Planning: nature, purpose and functions, types of plans, planning process, Strategies and Policies:Concept of Corporate Strategy, formulation of strategy, Types of strategies, Management by objectives (MBO), SWOT analysis, Types of policies, principles of formulation of policies

Organizing: nature, importance, process, organization structure: Line and Staff organization, Delegation of Authority and responsibility, Centralization and Decentralization, Decision Making Process , Decision Making Models, Departmentalization: Concept and Types (Project and Matrix),formal & informal organizations

UNIT-III

Staffing: concept, process, features; manpower planning; Job Analysis: concept and process; Recruitment and selection: concept, process, sources of recruitment; performance appraisal, training and development Directing: Communication-nature, process, formal and informal, barriers to Effective Communication, Theories of motivation-Maslow, Herzberg, McGregor ; Leadership–concept and theories, Managerial Grid, Situational Leadership. Transactional and Transformational Leadership

UNIT-IV

Controlling: concept, process, types, barriers to controlling, controlling Techniques: budgetary control, Return on investment, Management information system-MIS , TQM-Total Quality Management, Network Analysis-PERT and CPM. Recent Trends in Management:-Social Responsibility of Corporate Social Responsibility (CSR) and business ethics. Functional aspects of business: Conceptual framework of functional areas of management-Finance; Marketing and Human Resources

Text books

1.Management Concepts -Robbins, S.P; Pearson Education India
2.Principles of Management -Koontz &O'Donnel; (McGraw Hill)

Recommended books

1.Business Organization and Management –Basu ; Tata McGraw Hill
2.Management and OB--Mullins; Pearson Education
3.Essentials of Management –Koontz, Tata McGraw-Hill
4.Management Theory and Practice –Gupta, C.B; Sultan Chand and Sons, new Delhi
5.Prasad, Lallan and S.S. Gulshan. Management Principles and Practices. S. Chand & Co. Ltd., New Delhi.
6.Chhabra, T.N. Principles and Practice of Management. Dhanpat Rai& Co., Delhi.
7.Organizationalbehavior –Robins Stephen P; PHI.

NOTE: Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

EE-202N	Digital Electronics					
Lecture	**Tutorial**	**Practical**	**Theory**	**Sessional**	**Total**	**Time**
4	**0**	**0**	**75**	**25**	**100**	**3 Hr.**
Course Outcome						
CO1	**To understand fundamentals of Digital techniques, Binary codes**					
CO2	**To design basic circuits using Gates and MSI Devices**					
CO3	**To understand design of synchronous and Asynchronous sequential circuits A/D and D/A convertors**					
CO4	**Concept of Digital logic families, programmable logic devices**					

Unit-I

Fundamentals of Digital Techniques:

Digital signal, review of number systems, binary codes, BCD, Excess-3, Gray, EBCDIC, ASCII, logic gates- AND, OR, NOT, NAND, NOR, EX-OR, Boolean algebra, Error detection and correction, hamming code.

Unit-II

Combination Design using Gates:

Design using gates, K- map and Quine-Mccluskey methods of simplification.

Combinational design using MSI Devices

Multiplexers and Demultiplexers and their uses as logic elements, Decoders, Adders/Subtracters, BCD arithmetic circuits, Encoders, Decoders/Drivers for display devices.

Unit-III

Design of Sequential circuits:

Flip flops: S-R, J-K, T,D, master slave, edge triggered, shift registers, sequence generators, counters- asynchronous and synchronous, ring counters and Johnson Counter.

D/A &A/D Converters:

D/A converters- weighted resistor and R-2 R ladder, specifications for D/A converters, A/D converters: Sample and hold circuits, Quantization, Parallel-comparator, successive approximation, counting type, dual slope ADC, specifications of ADCs.

Unit-IV

Digital logic families:

Bipolar logic families: RTL, DTL, DCTL, HTL, TTL, ECL, MOS, and CMOS logic families. Tristate logic, interfacing of CMOS and TTL families.

Programmable logic devices:

ROM, PLA, PAL, FPGA and CPLDS.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

REFERENCES:

1. Modern Digital Electronics (Edition III) : R.P. Jain, TMH.
2. Digital Integrated Electronics: Taub& Schilling, MGH
3. Digital Principles and Applications: Malvino & Leach, MGH
4. Digital Fundamentals,Floyd,11th Ed.,Pearson

EE-204N	Electrical Measurements & Measuring Instruments					
Lecture	Tutorial	Practical	Theory	Sessional	Total	Time
3	1	0	75	25	100	3 Hr.
Course Outcomes						
CO1	To understand the concept of units, errors, measuring system fundamentals					
CO2	To understand the concept of measuring instruments					
CO3	To understand the concept of watt meters, energy meters, power factor & frequency meters					
CO4	To understand the concept of low & high resistance measurements, a.c.bridges					

UNIT – 1

UNITS, STANDARDS& ERRORS: S.I. units, Absolute standards (International, Primary, Secondary & Working Standards). True Value, Errors (Gross Systematic Random): Static characteristics of Instruments (Accuracy, precision, Sensitivity, Resolution & threshold).

MEASURING SYSTEM FUNDAMENTALS: Classification of instruments (Absolute & Secondary Instruments: indicating, recording &integrating instruments: based upon Principle of operation). Generalized instrument (Block diagram, description of blocks). Three forces in electromechanical indicating instrument (Deflecting, controlling & damping forces). Comparison between gravity & spring controls: comparison of damping methods & their suitability bearing supports, pivot-less supports (simple & taut-band). Scale information, instrument cases (covers).

UNIT – II

MEASURING INSTRUMENTS: Construction, operating principle, Torque equation, shape of scale, use as Ammeter or as Voltmeter (Extension of Ranges). Use on AC/DC or both. Advantages & disadvantages, errors (both on AC/ DC) of PMMC types, electrodynamic type, moving iron type (attraction, repulsion & combined types). Hot wire type & induction type, electrostatic type instruments. Introduction of Q meter, VTVM, B-H curve

UNIT – III

WATTMETERS & ENERGY METERS: Construction, operating principle, torque equation, shape of scale, errors, Advantages & disadvantages of Electrodynamics & induction type watt meters; single phase induction type Energy meter, Compensation & creep in energy meter.

POWER FACTOR & FREQUENCY METERS: Construction, operating principle, torque equation, advantages & disadvantages of Single phase power factor meters (Electrodynamics & moving iron types) & Frequency meters (Electrical Resonance type, Ferrodynamic & Electrodynamic types).

UNIT – IV

LOW & HIGH RESISTANCE MEASUREMENTS: Limitations of Wheat stone bridge; Kelvin's double bridge method, Difficulties in high resistance measurements, Measurement of high resistance by direct deflection, loss of charge method, Megaohm Bridge & meggar.

A.C.BRIDGES: General balance, Ckt. & Phasor diagram, applications, advantages/disadvantages of:Maxwell's inductance, inductance-capacitance, Hays, Anderson, Owens, De-Sauty's, Schering &Weins Bridges.Shielding & earthling

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

REFERENCES:

1. A Course in Elect. & Electronics Measurement & Instrumentation by A.K. Sawhney; Khanna Pub.
2. Electronics & Electrical Measurement & Instrumentation by J.B. Gupta, Kataria& Sons.
3. Electronics Instrumentation & Measurement technique, W.D. Copper &A.dHelfrick.
4. Measuring Systems by E.O. Doeblin; TMH.

EE-206N	Signals & Systems					
Lecture	Tutorial	Practical	Theory	Sessional	Total	Time
3	1	0	75	25	100	3 Hr.
Course Outcomes						
CO1	Introduce and classify signals and systems based on their properties.					
CO2	To understand the basic concepts of random variables and Linear time invariant systems.					
CO3	Familiarization with the sampling process and spectral analysis of signals using Fourier series.					
CO4	Apply transform techniques to analyze continuous-time and discrete-time signals and systems					

Unit-I

Introduction to Signals: Continuous and discrete time signals, deterministic and stochastic signals, periodic and aperiodic signals, even and odd signals, energy and power signals, exponential and sinusoidal signals and singular functions. Signal representation in terms of singular functions, orthogonal functions and their use in signal representation.

Introduction to Systems: Linear and non-linear systems, time invariant and time varying systems ,lumped and distributed systems, deterministic and stochastic systems, casual and non-causal systems, analog and discrete/digital memory and memory less systems.

Unit-II

Random Variables: Introduction to Random Variables, pdf, cdf, moments, distributions, correlation functions.

Linear Time Invariant Systems: Introduction to linear time invariant (LTI) systems, properties of LTI systems, convolution integral, convolution sum, causal LTI systems described by differential and difference equations. Concept of impulse response.

Unit-III

Discretization of Analog Signals: Introduction to sampling, sampling theorem and its proof. Effect of under sampling, reconstruction of a signal from sampled signal.

Fourier Series : Continuous time Fourier series (CTFS), Properties of CTFS, Convergence of Fourier series, Discrete time Fourier Series (DTFS), Properties of DTFS , Fourier series and LTI system, Filtering.

Unit-IV

Fourier Transform: Continuous Time Fourier Transform (CTFT), Properties of CTFT, Systems characterized by linear constant- coefficient differential equations.

Discrete time Fourier transform (DTFT), Properties of DTFT, Duality, Systems characterized by linear constant coefficient difference equations.

Laplace Transform: Introduction to Laplace transform, Region of convergence for laplace transform, Inverse Laplace transform, Properties of Laplace transform, Analysis and characterization of LTI systems using Laplace transform, System function algebra and block diagram representations,

Unilateral Laplace transform.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

REFERENCES :

1. Oppenheim, Willsky, Nawab, Signals and Systems, Prentice Hall India, 2nd Edition, 2009
2. Simon Haykins – "Signal & Systems", Wiley Eastern
3. Tarun Kumar Rawat, Signals and Systems, Oxford University Press.

EE-208N	Electrical Machines-II					
Lecture	Tutorial	Practical	Theory	Sessional	Total	Time
4	1	0	75	25	100	3 Hr.
Course Outcomes						
CO1	To study working & testing of three phase induction motor , special purpose induction motors ,starting methods					
CO2	To study Basic Concept of Electrical Machines and working of single phase induction motors					
CO3	To study working & testing of three phase Synchronous Generators					
CO4	To study working & testing of three phase synchronous motors					

UNIT-I

Induction Machines(A):

Basic concept of Induction machines: winding factors, generated e.m.f. and m.m.f distribution, a.c. winding, rotating magnetic field.

3-phase Induction Motor: Construction, features, production of torque, phasor diagram, equivalent circuit, performance analysis, torque -slip characteristics, running, light and blocked rotor test, load test on 3-ph I.M.

UNIT-II

Induction Machines(B):

Effect of rotor resistance, Effect of space harmonics, deep bar and double cage 3ph-induction motor.

Starting of 3-ph I.M. Starting methods of squirrel cage and wound rotor induction motor.

Induction Generator-Operation, applications, advantages.

Single phase induction motors:-

Constructional features & double revolving field theory, equivalent circuit, determination of parameters. Split phase, starting methods, types& applications.

UNIT-III

Three Phase Synchronous Generators: Principle, construction, EMF equation, armature winding, armature reaction, equivalent circuit, voltage regulation - synchronous reactance method , Rothert's m.m.f method, Potier triangle method, Output power equation, power angle curve, two reactance theory, slip test, Transient and sub-transient reactance, synchronization, parallel operation. S.C.R. and its significance, cooling of generators

UNIT-IV

Three Phase Synchronous Motor: Construction, Principle of operation, Equivalent circuit, torque, power developed , starting, V-curve, Hunting-causes , effects &reduction , synchronous condenser applications. Comparison between induction motor and synchronous motor, high startig torque motors.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

REFERENCES :

1. Electrical Machines, P.S. Bhimbra, Khanna Publishers Delhi
2. Electric Machines, Ashfaq Hussain, Dhanpat Rai
3. Theory of alternating current machinery: A.S. Langsdorf (TMH)
4. Generalized theory of Electrical Machines: P.S. Bhimbra

EE-210N	Electrical Engineering Materials & Processes					
Lecture	Tutorial	Practical	Theory	Sessional	Total	Time
3	0	0	75	25	100	3 Hr.
Course Outcomes						
CO1	To study properties of conductors and super conductors and other alloys.					
CO2	To study properties of insulators, diaelectric, semiconductor materials.					
CO3	To study properties of dia ,ferro, and paramagnetic materials					
CO4	To study various processes					

UNIT-I

Conductors, Properties of conductors, ACSR, High resistivity materials and their properties, Alloys, Soldering and brazing materials, superconductivity, super conductor materials and their applications.

UNIT-II

Insulators, classifications of insulators, dialectical materials, glass and ceramics, refractory materials and their uses, optical fibers, laser and opto-electronics materials, semiconductor materials, properties of semiconductor materials, thermosetting and thermoplast materials.

UNIT-III

Classification of material, Dia, Para, and Ferro magnetic materials-curie law and curie Weiss law (qualitative study).Ferromagnetism-Qualitative study of domain theory – Hysteresis phenomena. Hard and soft magnetic material and their applications. Ferrites, Structure and property.

UNIT-IV

Processes used in Plano technology e.g. Lapping, polishing, cleaning, masking, photolithography, diffusion, oxidation and metallization, welding, wire bonding, packaging and encapsulation, Heating- induction and dielectric, Electron beam welding and cutting, annealing, cold &Hot rolling.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

REFERENCES :

1. SP Seth "A course in Electrical Engg. Material" (Dhanpat Rai & Sons).
2. Dekker, "Electrical Engg. Materials" (PHI).
3. PL Kapoor,"A text book of Electrical Engg. Material" (Khanna Publishers).

EE-212N	Digital Electronics Lab					
Lecture	**Tutorial**	**Practical**	**External**	**Sessional**	**Total**	**Exam Time**
0	**0**	**2**	**25**	**25**	**50**	**3 Hr.**

LIST OF EXPERIMENTS:

1) Study of TTL gates- AND, OR, NOR, NAND, NOT, EX-OR, EX-NOR.
2) Design & realize a given function using K-Map and verify its performance.
3) To verify the operation of multiplexer &Demultiplexers.
4) To verify the operation of comparator.
5) To verify the truth tables of S-R, J-K, T& D type flip flops
6) To verify the operation of bi-directional shift register.
7) To design & verify the operation of 3-bit synchronous counter.
8) To design and verify the operation of synchronous UP/DOWN decade counter using JK flip flop & drive a seven segment display using the same.
9) To design and verify the operation of asynchronous UP/DOWN decade counter using JK flip flop & drive a seven segment display using the same.
10) To design and realize sequence generator for a given sequence using JK Flip flop.
11) Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.
12) Design a 4-bit shift register and verify its operation of a ring counter and a Johnson counter.

Note: At least ten experiments are to be performed; at least seven experiments should be performed from above list. Remaining three experiments may either perform from the above list or designed and set by the concerned institution as per the scope of the syllabus.

EE-214N	Instrumentation Lab					
Lecture	**Tutorial**	**Practical**	**External**	**Sessional**	**Total**	**Exam Time**
		2	**50**	**50**	**100**	**3 Hr.**

LIST OF EXPERIMENTS:

1. To identify the meters from the given lot w.r.t application.
2. To convert & calibrate a D'Arsonnal type galvanometer into a voltmeter & an ammeter.
3. To calibrate an energy meter with the help of a standard wattmeter & a stop watch
4. To measure power & p.f. in 3-phase circuit by 2-watmeter method using P. T and C.T.
5. To measure capacitance by De Sauty's bridge.
6. To measure inductance by Maxwell's bridge.
7. To measure frequency by Wien's bridge.
8. To measure magnitude & phase angle of a voltage by rectangular type potentiometer.
9. To measure magnitude & phase angle of a voltage by polar type potentiometer.
10. To measure low resistance by Kelvin's Double bridge.
11. To measure high resistance by loss of charge method.
12. To measure R,L,C, by Q metre

Note: At least seven experiments should be performed from above list. Remaining three experiments may either be performed from above list or designed & set by concerned institution as per scope of syllabus.

EE-216N	Signal and System Lab					
Lecture	**Tutorial**	**Practical**	**External**	**Sessional**	**Total**	**Exam Time**
		2	**25**	**25**	**50**	**3 Hr.**

LIST OF EXPERIMENTS:

1) To demonstrate some simple signal.

2) To explore the effect of transformation of signal parameters (amplitude-time-scaling and time-shifting).

3) To explore the various properties of the impulse signals.

4) To visualize the complex exponential signal and real sinusoids.

5) To identify a given system as linear or non-linear.

6) To explore the time variance and time invariance property of a given system.

7) To explore causality and non-causality property of a system.

8) To visualize the relationship between the continuous-time Fourier series and Fourier transform of a signal.

9) To visualize the relationship between the discrete-time Fourier series and Fourier transform of a signal.

10) To visualize the relationship between continuous-time and discrete-time Fourier transform of a signals.

11) To demonstrate the time domain sampling of band limited signals (Nyquist theorem).

12) To demonstrate the time domain sampling of non-band limited signals and anti aliasing filter.

13) To demonstrate the signal reconstruction using zero-order hold and first-order hold filters.

14) To demonstrate the sampling in frequency domain (Discrete Fourier Transform).

15) To demonstrate the spectral analysis using Discrete Fourier Transform.

17) To demonstrate the convolution and correlation of two continuous-time signals.

18) To demonstrate the convolution and correlation of two discrete-time sign

Note: At least ten experiments should be performed from above list.

EE-218N	Electrical Machine-II LAB					
Lecture	Tutorial	Practical	External	Sessional	Total	Exam Time
0	0	2	50	50	100	3 Hr.

LIST OF EXPERIMENTS:

1) To perform load test on a 3-phase induction motor & DC generator set and to determine the efficiency of induction motor.

2) Determine mechanical losses by light running of a 3-phase induction motor.

3) Study and starting of 1-phase induction motor. To perform light running and block rotor test and to determine the parameters of the equivalent circuit.

4) To perform the open circuit test and block rotor test on 3-phase induction motor and draw the circle diagram.

5) To perform & study effect of rotor resistance on a poly phase slip ring induction motor.

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6)To calculate regulation by synchronous impedance method:-

a) Conduct open and short circuit test on a three phase alternator.

b) Determine and plot variation of synchronous impedance with I_f

c) Determine SCR

d) Determine regulations for 0.8 lagging power factor, 0.8 leading power factor and unity PF.

7) To plot V curves of a synchronous machine.

a) Determination of X_o of a synchronous machine.

b) Measurement Xd&Xq (Direct axis and Quardrature axis reactance) by slip test

8) To measure Xq of synchronous machine (negative sequence reactance).

9) To calculate regulation by ZPF method.

10) To perform and study parallel operation of synchronous generators.

Note: At least ten experiments are to be performed; at least eight experiments should be performed from above list. Remaining two experiments may either be performed from the above list or designed and set by the concerned institution as per the scope of the syllabus.

MPC- 201NENVIRONMENTAL STUDIES

L	T	P	Sessional	Exam	Time
3	-	-	25	75	3H

UNIT I

The multidisciplinary nature of environmental studies. Definition, Scope and Importance. Need for public awareness. Natural Resources: Renewable and Non-Renewable Resources: Natural resources and associated problems.

(a) Forest Resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

(b) Water Resources- Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

(c) Mineral Resources- Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

(d) Food Resources- World Food Problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

(e) Energy Resources- Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

(f) Land Resources- Land as a resource, land, degradation, man induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyle.

UNIT II

Ecosystem- Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem. Ecological succession, Food Chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem.

a. Forest Ecosystem

b. Grassland Ecosystem

c. Desert Ecosystem

d. Aquatic Ecosystems (ponds, streams, lakes, rivers, oceans, esturaries

Field Work: Visit to a local area to document Environment assets-river/forest/grassland/ hill/ mountain. Visit to a local polluted site- Urban /Rural/Industrial/Agricultural. Study of common plants, insects and birds. Study of simple ecosystems-pond, river, hill, slopes etc. (Field work equal to 5 lecture hours).

UNIT III

Biodiversity and its conservation. Introduction, Definition: genetic, species and ecosystem diversity. Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity of global, National and local levels. India as a mega-diversity nation Hot spots of Biodiversity. Threats to biodiversity: Habitat loss, poaching of wild life, man-wildlife conflicts. Endangered and endemic species of India.Conservation of Biodiversity- In situ and Ex-Situ conservation of biodiversity.

Environmental Pollution: Definition, Cause, effects and control measures of- (a) Air Pollution (b) Water Pollution (c) Soil Pollution (d) Marine Pollution (e) Noise Pollution (f) Thermal Pollution (g) Nuclear Hazards

Solid waste management- cause, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management: floods, earthquake, cyclone and landslides

UNIT IV

Social Issues and the Environment, From unsustainable to sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management.

Resettlement and rehabilitation of people: Its problems and concerns. Case Studies. Environmental ethics-issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies.

Wasteland Reclamation, Consumerism and waste products, Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public Awareness, Human population and the Environment, Population growth, variation among nations. Population explosion-Family Welfare Programme, Environment and human health, Human rights, Value Education, HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and Human Health, Case Studies.

Suggested Text Books & References:

1. Environmental Studies- Deswal and Deswal. Dhanpat Rai & Co.
2. Environmental Science & Engineering Anandan, P. and Kumaravelan, R. 2009. Scitech Publications (India) Pvt. Ltd., India
3. Environmental Studies. Daniels Ranjit R. J. and Krishnaswamy. 2013. Wiley India.
4. Environmental Science- Botkin and Keller. 2012. Wiley, India.