Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination
(3rd SEMESTER

Course No.	Course Title	Nature of subject	No of Student enrolled	Dept. offering the subject	Weekly Load (Hours)		
		Compulsory (C) Elective (E)			L*	T*	P*
MATH-20IE / HUM-20IE	Mathematics-Ill / Basics of Industrial Sociology, Economics & Management.	C	66	Applied Sciences or Humanities	3	1	-
EE-203E	Network Analysis & Synthesis	C	66	Electronics	3	1	-
ELE-201E	Electromechanical Energy conversion	C	66	Electronics	3	1	-
CSE-203E	Data Structures	C	66	Computers	3	1	-
ECE-201E	Semiconductor Devices & Circuits	C	66	Electronics	3	1	-
ECE-203 E	Analog Communication	C	66	Electronics	3	1	-
ELE-203E	Electrical Machines Lab	C	66	Electronics	-	-	3
ECE-205E	Semiconductor Devices & Circuits Lab	C	66	Electronics	-	-	3
ECE-207E	Analog Communication Lab	C	66	Electronics	-	-	2
CSE-211E	Data Structures Lab	C	66	Computers	-	-	3
				TOTAL	18	6	11

3rd Semester
BASICS OF INDUSTRIAL SOCIOLOGY, ECONOMICS & MANAGEMENT

HUM – 201 E

L	T	P
3	1	-

Sessional	:	50
Theory	:	100
Total	:	150
Duration of Exam.	:	3 Hrs.

UNIT-I

Meaning of social change, nature of social change, theories of social change. The direction of social change, the causes of social change, the process of social change. Factors of social change – the technological factors, the cultural factors, effects of technology on major social institutions, social need of status system, social relations in industry.

UNIT-II

Meaning of Industrial Economic, Production Function, its types, Least Cost Combination, Law of Variable Proportion, Laws of Return – Increasing, Constant & Diminishing.

Fixed & variable costs in short run & long run, opportunity costs, relation between AC & MC, U-shaped short run AC Curve.

Price & Output Determination under Monopoly in short run & long run.

Price Discrimination, Price Determination under Discriminating Monopoly. Comparison between Monopoly & Perfect Competition.

UNIT – III

Meaning of Management, Characteristics of Management, Management Vs. Administration, Management – Art, Science & Profession, Fayol's Principles of Management.

Personnel Management – Meaning & Functions, Manpower – Process of Manpower Planning, Recruitment & Selection – Selection Procedure.

Training – Objectives & Types of Training, Various Methods of Training. Labour Legislation in India – Main provisions of Industrial disputes Act 1947;

UNIT – IV

Marketing Management – Definition & Meaning, Scope of Marketing Management, Marketing Research – Meaning, Objectives.

Purchasing Management – Meaning & Objectives, Purchase Procedure, Inventory Control Techniques.

Financial Management – Introduction, Objectives of Financial decisions, Sources of Finance.

Note : Eight questions are to be set taking two from each unit. The students are required to attempt five questions in all, taking at least one from each unit.

TEXT BOOKS :

1. "Modern Economic Theory" Dewett, K.K., S. Chand & Co.
2. "Economic Analysis" K.P. Sundharam & E.N. Sundharam (Sultan Chand & Sons).
3. "Micro Economic Theory" M.L. Jhingan (Konark Publishers Pvt. Ltd.).
4. "Principles of Economics" M.L. Seth (Lakshmi Narain Aggarwal Educational Publishers – Agra).
5. "An Introduction to Sociology", D.R. Sachdeva & Vidya Bhusan.
6. "Society – An Introductory Analysis", R.M. Maclver Charles H. Page.
7. "Principles and Practices of Management : R.S. Gupta; B.D. Sharma; N.S. Bhalla; Kalyani.

REFERENCE BOOKS

1. "Organization and Management : R.D. Aggarwal, Tata McGraw Hill.
2. Business Organization and Management : M.C. Shukla

3rd Semester
MATHEMATICS - III

MATH-201 E

L	T	P			
		Marks	Theory	:	100
3	1	-	Sessional	:	50
	Marks				
			Total	:	150
	Marks				
			Duration of Exam		: 3 Hrs.

UNIT – I

Fourier Series : Euler's Formulae, Conditions for Fourier expansions, Fourier expansion of functions having 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 Fourier and 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.

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.

Note : Examiner will set eight question, taking two from each unit. Students will be required to attempt five questions taking at least one from each unit.

3rd Semester

EE-203-E NETWORK ANALYSIS & SYNTHESIS

L T P	Sessional	:	50 Marks
3 1 0	EXAM	:	100 Marks
	TOTAL	:	150 Marks
	DURATION OF EXAM	:	3 HRS

UNIT I

TOPOLOGY :

Principles of network topology , graph matrices, network analysis using graph theory.

TRANSIENT RESPONSE :

Transient Response of RC, RL, RLC Circuits to various excitation signals such as step, ramp, impulse and sinusoidal excitations using laplace transform.

UNIT 2

NETWORK FUNCTIONS:

Terminal pairs or Ports, Network functions for one-port and two-port networks, poles and zeros of Network functions, Restrictions on pole and zero Locations for driving point functions and transfer functions, Time domain behavior from the pole-zero plot.

UNIT 3

CHARACTERISTICS AND PARAMETERS OF TWO PORT NETWORKS:

Relationship of two-port variables, short-circuit Admittance parameters, open circuit impedance, parameters, Transmission parameters, hybrid parameters, relationships between parameter sets, Inter-connection of two port networks.

UNIT 4

TYPES OF FILTERS AND THEIR CHARACTERISTICS :

Filter fundamentals, high-pass, low-pass, band-pass, and band-reject Filters.

NETWORK SYNTHESIS :
Positive real functions, synthesis of one port and two port networks, elementary ideas of Active networks.

TEXT BOOKS:
1. Network Analysis & Synthesis : Umesh Sinha; Satya Prakash Pub.
2. Network Analysis & Synthesis : F.F.Kuo; John Wiley & Sons Inc.

REFERENCE BOOKS:
1. Introduction to modern Network Synthesis : Van Valkenburg; John Wiley
2. Network Analysis: Van Valkenburg; PHI
3. Basic circuit theory:Dasoer Kuh; McGraw Hill.
4. A Course in Electrical Circuit Analysis by Soni & Gupta; Dhanpat Rai Publication.
5. Circuit Analysis : G.K. Mithal; Khanna Publication.
6. Networks and Systems : D.Roy Choudhury; New Age International.

NOTE : Eight questions are to be set in total covering entire course selecting two questions from each unit. Each question will be of equal marks. Students will be required to attempt five questions in all, selecting at least one question from each unit.

3rd Semester

ELE : 201 E ELECTROMECHANCIAL ENERGY CONVERSION

L	T	P			
3	1	-	Theory	:	100
			Sessional	:	50
			Total	:	150
			Duration of Exam	:	3 Hrs.

UNIT – I

MAGNETIC CIRCUITS AND INDUCTION

Magnetic Circuits, Magnetic Materials and their properties, static and dynamic emfs and force on current carrying conductor, AC operation of Magnetic Circuits, Hysteresis and Eddy current losses, frictional & copper losses.

TRANSFORMERS :

Basic theory, construction, operation at no-load and full-load, equivalent circuit, phasor diagram, O.C. tests for parameters determination, efficiency and regulation, auto-transformer, introduction to three-phase transformer; Scott connection, parallel operation of transformer.

UNIT – II

PRINCIPLES OF ELECTROMECHANCIAL ENERGY CONVERSIONS

Force and torque in magnetic field system, energy balance, energy and force in singly excited magnetic field system, concept of co-energy, forces and torques is system with permanent magnets, dynamic equation.

DC MACHINES

Basic theory of DC generator, brief idea of construction, emf equation, load characteristics, basic theory of DC motor, concept of back emf, torque and power equations, load characteristics, starting and speed control of DC motors, Types of DC generator & motors Armature reaction, communication, characteristics of DC machines.

UNIT – III

INDUCTION MOTOR

Basic theory, construction, Phasor diagram, advantage of IM over other conventional machines Equivalent circuit, Torque equation, Load characteristics, starting speed control of induction motor, Introduction to single phase Induction motor double field revolving theory, types of single phase IM and its applications, open circuit & block rotor test.

UNIT-IV

SYNCHRONOUS MACHINES

Construction and basic theory of synchronous generator, emf equation, advantages of stationary armature, Regulation, Basic theory of synchronous motor, v-curves, starting of synchronous motor, comparison between

synchronous & induction, open circuit & block rotor teat of 3 phase and 1 phase motor.

Text Book :

1. Electrical Machines : P.S. Bimbhra; Khanna

REFERENCE:

1. Electrical Machines : Nagarath and Kothari; TMH
2. Electrical Machines : Mukherjee and Chakravorti; Dhanpat Rai & Sons.
3. Electrical Technology (Vol-II) : B.L. Theraja; S. Chand.

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

3rd Semester
DATA STRUCTURES
CSE-203 E

L	T	P			
3	1	-			

THEORY : 100 Marks
SESSIONAL : 50 Marks
TOTAL : 150 Marks
TIME : 3 Hrs.

Unit-1: Introduction : Introduction to Data Structures: Definition & abstract data types, Static and Dynamic implementations, Examples and real life applications; built in and user defined data structures, Ordered list and Operations on it.

Arrays: Definition, implementation, lower bound, upper bound, addressing an element at a particular index for one dimensional arrays, Two dimensional arrays and Multi-dimensional arrays. Implementation of Data Structures like structure/ Record, Union, Sparse matrices : implementation of transpose.

Stacks : Sequential implementation of stacks, operations, Polish-notations, Evaluation of postfix expression, Converting Infix expression to Prefix and Postfix expression, Applications.

Unit-2: Queues: Definition, Sequential implementation of linear queues, Operations. Circular queue: implementation (using arrays), Advantage over linear queue, Priority queues & Applications.

Linked Lists : Need of dynamic data structures, continuous & linked implementation of lists. Operations on lists. Dynamic implementation of linked lists, Operations. Comparison between Array and Dynamic Implementation of linked list. Linked implementation of stacks and queues. Circular lists, implementation of primitive operations. Doubly linked lists : continuos & dynamic implementation, operations.

Unit-3: Trees : Definition, Basic terminology, Binary tree, Array and Dynamic Implementation of a binary tree, primitive operations on binary trees. External and internal nodes. Binary tree traversals : preorder, inorder and postorder traversals. Representation of infix, postifix and prefix expressions using trees. Representation of lists as binary trees. Introduction to Binary Search Trees, B trees, B+ trees , AVL Trees, threaded trees, balanced multi way search trees,

Unit- 4 : Graphs :Definition of undirected & Directed Graphs & Networks, Basic terminology, Representation of graphs,. Graph traversals and spanning forests, minimum-spanning trees, computer representation of graphs.

Tables : Definition, Hash Functions, Implementation & Applications.

Sorting & Searching: Basic Searching techniques (Linear & binary), Introduction to Sorting. Sorting using selection, insertion, bubble, merge, quick, radix, heap sort.

Text Book:

- Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.

Reference Books:

- Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
- Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW
- Fundamentals of computer algorithms by Horowitz Sahni and Rajasekaran.
- Data Structures and Program Design in C By Robert Kruse, PHI,
- Theory & Problems of Data Structures by Jr. Symour Lipschetz, Schaum's outline by TMH
- Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
- Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H

Note: Eight questions will be set in all by the examiners taking at least two questions from each unit .Students will be required to attempt five questions in all at least one from each unit.

3rd Semester

SEMICONDUCTOR DEVICES AND CIRCUITS
(ECE-201E)

L	T	P		
		Marks	THEORY	: 100
3	1	-	SESSIONAL:	50
		Marks		
			TOTAL	: 150
		Marks		
			TIME	: 3

Hrs.

UNIT-I

P-N JUNCTION DIODE: - P-N junction and its V-I characteristics, P-N junction as rectifier, diode as a circuit element, the load line concept, half-wave and full-wave rectifiers, filter circuits. Photoelectric devices & their applications.
REGULATED POWER SUPPLIES: - Series and shunt voltage regulators, power supply parameters, three terminal IC regulators, SMPS.

UNIT-II

TRANSISTORS: - Review of BJT and its Hybrid model, analysis of a transistor amplifier circuit using h-parameters, Emitter follower, Miller's theorem, Frequency response of R-C coupled amplifier, Multistage amplifier, classification of amplifiers, Transistor Biasing; Operating point, Bias stability, Collector to Base bias, Self-bias, emitter bias, bias compensation, Thermistor and sensitor compensation, High frequency limitations on BJT'S

UNIT-III

FEEDBACK OSCILLATORS AND POWER AMPLIFIERS: - Feedback in amplifiers: Basic feedback topologies. Oscillators: Barkhausen's criterion, sinusoidal oscillators, Phase shift oscillators, Resonant circuit oscillator, a general form of oscillator, the Wein Bridge oscillator, Crystal oscillator. Introduction to power amplifiers and its various types with applications.

UNIT-IV

FIELD EFFECT TRANSISTORS: - JFET, pinch-off voltage, Volt-ampere characteristics, small signal model, MOSFET-Enhancement & Depletion mode, V-MOSFET, JFET & MOSFET amplifiers, Biasing of JFETS and MOSFETS.

TEXT BOOKS:

1. Integrated Electronics: Millman & Halkias; Mc Graw Hill.
2. Electronic circuit analysis and design (Second Edition): D.A. Neamen; TMH

REFERENCE BOOKS:

1. Electronics Principles: Malvino; Mc Graw Hill.
2. Electronics circuits: Donald L. Schilling & Charles Belove: Mc Graw Hill.
3. Electronics Devices & Circuits: Boylestad & Nashelsky; Pearson.

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.

3rd Semester

ANALOG COMMUNICATION
(ECE-203E)

L	T	P		
		Marks	THEORY	: 100
3	1	-	SESSIONAL	: 50
		Marks		
			TOTAL	: 150
		Marks		
			TIME	: 3

Hrs.

UNIT – I
NOISE: Classification of Noise, Various sources of Noise, Methods of Noise Calculation in networks and inter connected networks. Addition of noise due to several sources; noise in amplifiers in cascade, noise in reactive circuits, Noise figure, its calculation and measurement. Noise temperature, Mathematical representation of random noise, narrow band noise and its representation. Transmission of noise through linear systems, signal to noise ratio, noise bandwidth.

UNIT-II
MODULATION TECHNIQUES: Basic constituents of Communication Systems, need of modulation, Amplitude modulation, spectrum of AM wave, modulation index, DSBSC modulation, SSB Modulation, Collector modulation, Square law modulation methods, Methods of generating SSB Signals, vestigial side band modulation, Detection of AM Signal; Diode detector, Square Law Detector. Time Constant RC in diode detector. Diode detector with filter. FDM, Power relations in AM wave.

UNIT-III
ANGLE MODULATION: frequency and phase modulation, spectrum of FM Wave, modulation index and Bandwidth of FM Signal, NBFM and WBFM, Comparison between FM and PM Signals, FM and AM signals, AM and NBFM Signals, FM generation methods, Demodulation methods; slope detector, ratio detector, Foster-Seeley discriminator. Pre-emphasis & De-emphasis, effect of noise on carrier; noise triangle.

UNIT-IV

TRANSMITER AND RECEIVER: Classification of radio transmitters, Block diagram of AM transmitter, Frequency Scintillation, Frequency drift, Radio broadcast transmitter, Radio telephone transmitter, Privacy devices, Armstrong FM transmitter, Simple FM transmitter using Reactance modulator.

Classification of radio receivers, TRF receives, superheterodyne receivers, Image Signal rejection, frequency mixers. Tracking and alignment of receivers, Intermediate frequency, AGC, AFC, SSB receiver.

REFERENCE BOOKS:

1. Taub & Schilling, Principles of Communication Systems, TMH.
2. Mithal G K, Radio Engineering, Khanna Pub.
3. Sirnon Haykin, Communication Systems, John Wiley.
4. Dungan F.R., Electronics Communication System, Thomson-Delmar
5. Electronics Communication System: Kennedy; TMH

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.

3rd Semester

ELE – 203E **ELECTRICAL MACHINES LAB**

L	T	P
0	0	3

Sessional : 50
VIVA : 25
Duration of Exam : 3 Hrs.

LIST OF EXPERIMENTS

1. To perform open and short circuit tests on 1-phase transformer and to calculate efficiency.
2. To perform Sumpner's back to back test on-phase transformer.
3. Parallel operation of two 1-phase transformers.
4. Study of construction of a DC machine.
5. To plot magnetizing of a DC SE Generator and find its critical resistance & critical speed.
6. Speed Control of a DC motor by armature control & field control methods.
7. Open circuit & Block test of 1-phase induction motor.
8. Light running & block rotor test of 3-phase I.M. with starting.
9. To plot V curve of a synchronous motor.
10. To study scott connection of transformer.
11. To study starting running & reversal of direction of 3-phase I.M.
12. To perform load test on a 3-phase I.M. D.C. generator set & to determine the efficiency of I.M.

NOTE : Ten experiments are to be performed, out of which 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 institution as per the scope of the syllabus.

3rd Semester

SEMICONDUCTOR DEVICES & CIRCUITS LAB
(ECE-205E)

L	T	P		
		Marks		
-	-	3	Sessional :	25
		Marks	Viva :	25
			Total :	50
		Marks		
			Time :	3hrs.

LIST OF EXPERIMENTS: -

1. Measurement & study of P-N junction diode-I-V and C-V characteristics.
2. Study of Half-wave and Full-wave rectifier.
3. Measurement and study of solar cell –I-V characteristics.
4. Study of Active filters.
5. Study of diode as Clipper and Clamper.
6. Study of Zener diode as Voltage Regulator.
7. Measurement and study of Input and Output characteristics of a BJT.
8. Study of CE amplifier-Current & Power gains and Input, Output Impedances.
9. To study the frequency response of RC coupled amplifier.
10. Measurement and study of Output characteristics of JFET.
11. Measurement and study of Output characteristics of MOSFET.
12. Study of SCR/Thyristor characteristics.
13. Study of UJT characteristics.
14. Study of Push-Pull amplifier.

NOTE:
At least ten experiments are to be performed from above list.

3rd Semester

ANALOG COMMUNICATION LAB
(ECE-207E)

L	T	P		
		Marks		
-	-	2	Sessional :	25
		Marks	Viva :	25
			Total :	50
		Marks	Time :	3hrs.

LIST OF EXPERIMENTS: -

1. Study of AM Modulation/Demodulation
2. Study of FM Modulation/Demodulation.
3. Study of Diode detector and AGC.
4. To study Sampling theorem.
5. Sensitivity of a superhet Receiver.
6. Selectivity of a superhet Receiver.
7. Fidelity of a superhet Receiver.
8. Study of Pulse Amplitude Modulation/Demodulation.
9. Study of Pulse Width Modulation/Demodulation.
10. Study of Pulse Position Modulation/Demodulation.

NOTE:
At least seven experiments are to be performed from above list and the concerned institution as per the scope of the syllabus can set remaining three.

3rd Semester

DATA STRUCTURES LAB
(CSE-211E)

L	T	P		
		Marks		
-	-	3	Sessional	: 50
	Marks		Exam	: 25
			Total	: 75
	Marks			
			Duration of Exam: 3 Hrs.	

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration & recursion concepts write programs for finding the element in the array
   using Binary Search Method
3. write a program to perform following operations on tables using functions only
   a) Addition b) Subtraction c) Multiplication d) Transpose
4. Write a program to implement Queue.
5. Write a program to implement Stack.
6. Write a program to implement the various operations on string such as length of string concatenation, reverse of a string & copy of a string to another.
7. Write a program for swapping of two numbers using 'call by value' and 'call by reference strategies.
8. Write a program to implement binary search tree.
   (Insertion and Deletion in Binary search Tree)
9. Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the link list
10. Write the program for implementation of a file and performing operations such as insert, delete, update a record in the file.
11. Create a linked list and perform the following operations on it
    a) Add a node b) Delete a node
12. Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements.
13. Write a program to simulate the various graph traversing algorithms.
14 Write a program, which simulates the various tree traversal algorithms.
15 Write a program to implement various Searching Techniques.
16 Write a program to implement Sorting Techniques.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.