BE **III** Semester **Electronics & Communication Engineering**						
COURSE CONTENTS						
EC-3001	**Communication Network and Transmission Lines**	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	0	4	70	22

Unit- I
Characteristic Parameters of symmetrical and asymmetrical two port networks and their design: image impedance, iterative impedance, characteristic impendence, propagation coefficient, image transfer coefficient, iterative transfer coefficient, Lattice and Bridged-T networks, reactive matching networks, matching techniques, Insertion Loss, symmetrical and asymmetrical attenuators and their design.

Unit-II
Passive LC Filters: Analysis and design of Low pass, high pass, band pass and band elimination filters, m-derived filters, composite filters, Filter specifications, Butterworth approximation, Chebyshev Approximation, elliptic function approximation, frequency transformation

Unit-III
Positive real function, LC,RL.RC and RLC network synthesis, Foster and Cauer network, minimum positive real function, Brune's method, Bott - Duffing method ,Synthesis-coefficient.

Unit –IV
Transmission line frequencies, parameters of line and coaxial cable at radio frequencies, dissipation-less line, characteristic impendence and propagation constant, waveform distortion, attenuation and phase equalizers, distortion- less line, loading liner reflection on a line, reflection coefficient, input and transfer impedances, open circuit and short circuit line, reflection factors, reflection loss , insertion loss, T and tt equivalents of a line, location of line fault. Construction and design of two wire line and coaxial cable.

Unit-V
Line at radio frequencies, parameters of line and coaxial cable at radio frequencies, dissipation-less line, voltage and current on a dissipation-less line, Standing waves, standing wave ratio, input impedance of open circuit and short circuit, power and impedance measurement on lines, eights-wave, Quarter-wave and half wave line, circle diagram, Smith chart, solution of problems using smith chart, single and double stub matching, introduction to micro-strip lines and its analysis.

References:

1.   J.D Ryder: Network and Transmission Lines,2nd edition. Phi
2.   M.E Valkenberg: Introduction to Modern Network synthesis, Wiley Eastern Ltd.
3.   G.K. Mithal : Network Analysis, Khanna Publishers.
4.   Umesh Sinha: Network and Transmission lines, Satya Prakashan.
5.   Suresh: Electric Circuits and Networks, Pearson Education.

BE **III** Semester **Electronics & Communication Engineering**						
COURSE CONTENTS						
EC-3002	**Electronic Instrumentation**	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	2	6	70	22

Unit- I
Measurement and Error: Accuracy and Precision, Sensitivity, Linearity, Resolution, Hysterisis, Loading Effect, Measurements of Current, Voltage, Power and Impedance: DC and AC Ammeter, DC Voltmeter- Chopper type and solid state, AC voltmeter using Rectifier, Average, RMS, Peak Responding voltmeters, Multi – meter, Power meter, Bolometer and Calorimeter.

Unit- II

Cathode Ray Oscilloscope (CRO): Different parts of CRO, Block diagram. Electrostatics focusing, Electrostatic deflection, Post deflection acceleration, Screen for CRTs, Graticules, Vertical and Horizontal deflection system, Time base circuit, Oscilloscope Probes, Applications of CRO, Special purpose Cro Multi input, Dual trace, Dual beam, Sampling, Storage(Analog and Digital) Oscilloscope.

Unit-III
AC Bridges: Maxwell's bridge(Inductance and Inductance- Capacitance) Hay's bridge, Schering Bridge(High voltage and Relative permittivity), Wein bridge, Wagner earth detector, Impedance measurement by Q- meter, Non- Electrical Quantities (Transducer): Classification of Transducers, Strain gauge, Displacement Transducer- Linear Variable Differential Transformer (LVDT) and Rotary Variable Differential Transformer (RVDIT),Temperature Transducer- Resistance Temperature Detector(RTD), Thermistor, Piezo-electric transducer, Optical Transducer –Photo emissive, Photo conductive, Photo –diode ,Photo Transistor, nuclear Radiation Detector.

Unit- IV
Wave Analyzer(Frequency selective and Heterodyne), Harmonic Distortion Analyzer, Spectrum Analyzer, Network Analyzer, Signal and function Generators, Sweep Frequency Generator, Pulse and Square Wave Generator, Beat Frequency Oscillator.

Unit-V
Digital Measurement and Instruments : Advantages of Digital Instrument over Analog Instrument, Digital –to-analog conversion (DAC) –Variable resistive type, R-2R ladder type, Binary ladder, Weighted converter using Op-amp and transistor, Practical DAC, Analog –to digital conversion,(ADC) –Ramp Technique, Dual Slope Integrating Type, Integrating Type (Voltage to Frequency) Successive Approximations, Digital voltmeters and multi-meters, Resolutions and sensitivity of digital meter, PLC structure, principal of operation, response time and application.

References:

1. H.S Kalsi: Electronics Instrumentations, TMH
2. K.Sawhney: Instrumentation and Measurements, Dhanpat Rai and Co.
3. Helfric and Cooper: Modern Electronic Instrumentation and Measurement Techniques: Pearson.

BE **III** Semester Electronics & Comm. Engg.						
COURSE CONTENTS						
EC-3003	**Semiconductor Devices**	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	2	6	70	22

Unit- I
Semiconductor intrinsic and extrinsic-type and n-type, energy band diagrams, majority and minority carrier, charge density in semiconductor, generation and recombination of charges, process of diffusion, diffusion and drift currents, Hall effects and its applications, p-n junction, depletion layer , potential barrier, electric field, forward and reverse biased junction, current components in p-n diode, current equation, V-I characteristics, cut in voltages of Si and Ge diode, transition and diffusion capacitance, power dissipation , p-n junction diode as rectifier, clipper and clamper.

Unit-II
Optoelectronic and miscellaneous devices: Characteristics and application of zener diode, Varactor diode, Schottky diode, Tunnel Diode, PIN diode, LED, Photoconductor cells, Photodiodes, solar cell, phototransistors, opto-couplers, thermistors, seven segment displays.

Unit- III
Bipolar junction transistor_ Construction, basic operation, current components and equation, CB,CE and CC- configuration, input and output characteristics, Early effect region of operation –active, cutoff and saturation region, Ebers-moll model, power dissipation in transistor (pdmax rating) Uni-junction Transistor (UJT) : Principle of operation, Characteristics.

Unit- IV
Field Effect Transistor – Construction, n channel and p channel, characteristics, parameters, equivalent model and voltage gain, Enhancement and depletion MOSFET and its characteristics , analysis of FET in various configuration.

Unit- V
Thyristor Family- Silicon Controlled Rectifier, V- I Characteristics, Transistor Analogy, Turn- On and Turn-off Mechanism, Series and Parallel Combination of SCR, Protection Circuits, Introduction to Diac, Triac, Power MOSFET,IGBT and GTO.

References:
1.   Boylestand and Nashelsky: Electronics Devices and Circuit Theory, Pearson Education
2.   Millman and Halkias: Integrated electronics, TMH
3.   Graham Bell: Electronics Devices and Circuits, PHI
4.   Ned mohan: Power electronics, John wiley and sons
5.   Sender and Smith: Microelectronics, Oxford Press.
6.   Streetman: Electronic Devices, Pearson Education.
7.   Neamen Donald: Electronics Circuits Analysis and Design,TMH
8.   Salivahanan et al: Electronic Devices and Circuits,TMH

BE **III** Semester **Electronics & Communication Engineering**						
COURSE CONTENTS						
EC-3004	**Network Analysis**	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	2	6	70	22

Unit-I

Introduction to circuit elements R,L,C and their characteristics in terms of linearity & time dependant nature, voltage& current sources, controlled & uncontrolled sources, KCL and KVL analysis, Nodal & mesh analysis, analysis of magnetically coupled circuits, Transient analysis:- Transients in RL, RC &RLC circuits, initial conditions, time constants, Steady state analysis concepts of phasor & vector, impedance& admittance, Network topology, concept of Network graph, Tree, Tree branch &link, Incidence matrix, cut set and tie set matrices, dual networks, Dot convention co-efficient, tuned circuits, Series & parallel resonance.

Unit-II

Network Theorems for AC & DC circuits- Thevenins & Norton's, Superposition's, Reciprocity Compensation, Substitution, Maximum power transfer, and Millman's theorem, Tellegen's theorem, problems with dependent& independent sources.

Unit-III

Frequency domain analysis- Laplace transform solution of Integro-differential equations, transform of waveform synthesized with step ramp, Gate and sinusoidal functions, Initial & final value theorem, Network Theorems in transform domain.

Unit- IV

Concept of signal spectra, Fourier series co-efficient of a periodic waveform, symmetries as related to Fourier coefficients, Trigonometric & Exponential form of Fourier series.

Unit- V

Network function & Two port networks- concept of complex frequency, Network & transfer functions for one port & two ports, poles and zeros, Necessary conditions for driving point & transfer function. Two port parameters- Z,Y,ZBCD, Hybrid parameters their inverse& image parameters, relationship between parameters, Interconnection of two ports networks, Terminated two port network.

References:
1. M.E Van Valkendburg, Network Analysis, (PHI)
2. F.F. Kuo, Network Analysis
3. Mittal GK; Network Analysis : Khanna publisher
4. Mesereau and Jackson: Circuit Analysis- A system Approach : Pearson
5. Sudhakar & Pillai: Circuit & Networks – Analysis and Synthesis: TMH
6. Hayt W.H & J.E Kemmerly: Engineering Circuit Analysis TMH
7. Decarlo Lin: Linear circuit Analysis : Oxford
8. William D Stanley: Network Analysis with Applications,Pearson Education
9. Roy Choudhary D: Network and System : New Age pub.
10. Charled K Alexander & Matthew N.O. Sadiku: Electrical Circuits :TMH
11. Chakraborti: Circuit theory: Dhanpt Rai
12. B.Chattopadhyay & P.C Rakshit: Fundamental of Electrical Circuit theory ; S chand
13. Nilson & Riedel, Electric Circuits :Pearson

BE **III** Semester **Electronics & Communication Engineering**						
COURSE CONTENTS						
EC-3005	**Java Programming**	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	0	0	4	4	60	20

Unit- I

Basic Java Features- C++ Vs JAVA, JAVA Virtual machine, Constant & Variables, Data Types, Class, Methods, Objects. Strings and Arrays, Type Casting, Operators, Precedence relations, Control Statements, Exceptions Handling, File and Streams, Visibility, Constructors, Operator and Methods Overloading, Static Members, Inheritance: Polymorphism, Abstract methods and classes.

Unit- II

Java Collective Frame Work- Data Structures: Introduction, Type- Wrapper Classes for Primitive Types, Dynamic Memory Allocation, Linked List, Stack, Queues. Trees Generics: Introduction, Overloading Generic methods, Generic Classes, Collections: Interface Collection and Class Collections, Lists, Array list and Iterator, Linked List, Vector Collections Algorithms: Algorithm sorts, Algorithm Shuffle, Algorithms reverse, Fill copy max and min Algorithm binary Search, Algorithms add all, Stack Class of Package Java, Until Class Priority Queue and Interface Queue Maps, Properties Class, Un-modifiable Collections.

Unit-III

Advance Java Features- Multithreading: Thread States, Priorities and Thread Scheduling, Life Cycle of a Thread, Thread Synchronization, Creating and Executing Threads, Multithreading with GUI, Monitors and Monitor locks. Networking: Manipulating URLs ,Reading a file on a Web Server, Socket programming, Security and the Network, RMI, Networking, Accessing Databases with JDBC; Relational Databases ,SQI My SQL, Oracle.

Unit- IV

Advance Java Technologies – Servlets: Overview and Architecture, Setting up the Apache Tomcat Server, Handling HTTP get Requests, Deploying a web Application, multitier Applications, Using JDBC form a Servlet, Java Server Pages (JSP): Overview, First JSP Example, Implicit Objects Scripting Standard Actions, Directives, Multimedia: Applets and Application: Loading, Displaying and Scaling Images, Animating a Series of images, Loading and playing Audio clips.

Unit-V

Advance Web/Internet Programming (Overview): J2ME, J2EE, EJB, XML.

References:

1. Deitel & Deitel, "JAVA, How to Program" PHI, Pearson.
2. E. Balagruswamy, "Programming in Java" TMH Publications
3. The Complete Reference: Herbert Schildt, TMh
4. Peter Norton, "Peter Norton Guide to java Programming" Techmedia.
5. Merlin Hughes, et al: Java Network Programming, Manning Publications/Prentice Hall