UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME
FOR THE B.E. 3rd SEMESTER ELECTRONICS & COMMUNICATION ENGG.
FOR EXAMINATION TO BE HELD FOR BATCH 2014 & ONWARDS

Course		Curriculum Hrs/Week			Marks			
Course No.	**Course Name**	**L**	**T**	**P**	**Theory**	**Sessional**	**Practical**	**Total**
ECE-301	Electronic Devices & Circuits-I	3	2	0	100	50	--	150
ECE-302	Electromagnetic Field & Transmission Lines Theory	3	2	0	100	50	--	150
MTH-311	Engineering Mathematics-III	3	2	0	100	50	--	150
M-314	Thermal Engineering	3	2	0	100	50	--	150
EE-301	Principle of Electrical Engg.	3	2	0	100	50	--	150
EE-302	Network Analysis & Synthesis	3	2	0	100	50	--	150
EE-308	Electrical & Electronics Workshops	0	0	3	---	--	50	50
EE-309	Principle of Electrical Engg.- Lab	0	0	3	---	--	50	50
	Total	**18**	**12**	**06**	**600**	**300**	**100**	**1000**

CLASS: B.E. 3RD SEMESTER
BRANCH: E&C, AEI
COURSE CODE: ECE-301
TITLE: ELECTRONIC DEVICES & CIRCUITS-I
DURATION OF EXAM: 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	50

SECTION-A

SEMICONDUCTOR DIODES: Introduction to pn junction diodes, Equivalent circuit & symbol, pn junction as rectifier, Ohmic contact & rectifier rectifying contact, Short circuit & open circuit pn junction diodes, Current components in pn junction diode & law of junction, Volt ampere characteristics, Diode capacitances, Static & dynamic resistances, Concept of load line, Zener diode and its break down phenomena, Tunnel diode, Schottky diode, LED, photo diode, varactor diodes, Numerical problems.

RECTIFIERS & FILTERS: Half wave, Full wave & bridge rectifiers with necessary derivations, Voltage regulation ,Capacitor filter, Inductor filter, LC filter with necessary derivation for ripple factor, Bleeder resistor, Numerical problems.

BIPOLAR JUNCTION TRANSISTOR: Introduction, Transistor basics (unbiased & biased transistor), Generalized transistor equation, Transistor current components, Early effect, Ebers-Moll Model,Transistor configurations & characteristics, Reach through & avalanche phenomena, Numerical problems.

SECTION –B

FIELD EFFECT TRANSISTORS: Introduction, Construction of JFET, Operation, Symbol, JFET-Characteristics, JFET Parameters and their relationship, Biasing of FET, with necessary derivations. Comparison between JFET and BJT & MOSFET, FET small signal model , Low frequency model of Common Source & Common drain Amplifiers & their analysis. MOSFET (Depletion & enhancement), Characteristics, Symbol and Operation.

DIODE CLIPPER & CLAMPER CIRCUITS: Diode series & shunt clippers, Clipping at two dependent levels, Diode comparator circuit, Clamping circuits, Clamping at certain voltage level, steady state output waveform for a Square wave input, Clamping circuit theorem, Diode sampling gates.

LINEAR WAVE SHAPING CIRCUITS: RC circuit (both high pass & low pass), RLC circuits & their response to various waveforms such as sinusoidal, step Voltage, Pulse, Square wave, Ramp etc. RC circuit as differentiator & integrator.

RECOMMENDED BOOKS :

1. Integrated Electronics — Millman Halkias
2. Electronics Devices — Bolystead
3. Electronics Devices — Malvino Leach
4. Pulse, Digital & Switching Waveforms — Millman & Taub
5. Pulse Circuits — D.A. Bell
6. Solid state electronics devices — B.G.streetman

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS: B.E. 3RD SEMESTER
BRANCH: E&C, EE
COURSE NO: ECE-302
COURSE TITLE: ELECTROMAGNETIC FIELD & TRANSMISSION LINES THEORY
DURATION OF EXAM: 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	50

SECTION - A

ELECTROSTATICS : Revision of vector analysis with cylindrical, Spherical & polar coordinates, Electrostatic Potential, potential, Potential gradient, Gradient operator, Conductors, Method of images, Energy density in electrostatics field, Electric field in dielectric media, Capacitance, Solution of Electrostatic problems using Poisson's & Laplace equation.

MAGNETOSTATICS : Magnetic flux density, & Magnetic potential, Torque on a closed circuit, Energy density in the magnetic field.

MAXWELL EQUATION UNIFORM PLANE WAVE : Application of Maxwell equation to circuits, Resonant cavity, Radiation antennas, Rotating magnetic field theory, Wave motion in perfect dielectric, Plane wave in lossy dielectric, Propagation in good conduction, Skin effect, Poynting theorem, Standing wave ratio, Polarization, Reflection of uniform plane wave,

SECTION – B

TRANSMISSION LINE : Basic principles of T.L, Equivalent ckt of T.L, Basic transmission line equation, Input impedance, infinite T.L, Characteristics impendence (Zo), Propagation constant, attenuation constant, Phase constant, open and short circuits T.L, Velocity, wavelength, Voltage and power on line. Distortion in line Reflection and its coefficient,

LINE AT HIGH FREQUENCIES : Line Equation, Waveform on line terminated in various impedances, SWR, & its relation with reflection coefficient. Impedance of short Circuit and open Circuit line. Characteristic of ƛ/2 & ƛ/4 lines. Principle of Impedance matching & use of smith chart for impedance matching using ƛ/4 transformer & single stub.

BOOK RECOMMENDED :

01. Engineering Electromagnetic By Jseph A. Edminister

02. Introduction to Electromagnetic By Griffith

03. Engineering Electromagnetic By Jr. Hyat

04. Network Line & Filters By J. D. Ryder

05. Antenna & Wave Propagation By K. D. Prasad

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: B.E. 3RD SEMESTER

BRANCH: ELECTRONICS & COMMUNICATION ENGG.	**L**	**T**	**MARKS**	
COURSE TITLE: ENGINEERING MATHEMATICS – III	**3**	**2**	**Theory**	**Sessionals**
COURSE No. MTH-311			**100**	**50**

DURATION OF EXAM: 3 HOURS

SECTION-I

LAPLACE TRANSFORMS :

Laplace Transforms, Inverse Laplace Transforms, Properties of Laplace Transforms, LT of unit step function, Impulse function, Periodic function, Initial value theorem, Final value theorem, Convolution theorem, Application of LT to solve linear differential equations and convolution type integral equations.

INTEGRAL TRANSFORMS AND FOURIER INTEGRALS :

Integral transforms and Fourier Integrals Fourier integral theorem, Fourier sine and cosine Integrals, and their inverses.

SECTION-II

SPECIAL FUNCTIONS :

Special Functions Legendre polynomials, Rodgrigue's formula, Recurrence formulae, generating function, Orthogonality of Legendre polynomials, Bessel function of Ist kind. Recurrence formulae, generating function, Orthoganality of Bessel function.

BOOLEAN ALGEBRAS :

Boolean Algebras, Lattices, Finite Boolean algebra, C.N.F and D.N.F, Application of Boolean algebra to switching theory.

BOOKS RECOMMENDED :

01.	Higher Engineering Mathematics	B.S. Grewal
02.	Boolean Lattices	V.K. Khanna
03.	Engineering Mathematics-III	Bhopinder Singh

NOTE : There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS: B.E. 3RD SEMESTER
BRANCH : ELECTR. & COMM. ENGG,
ELECTRICAL ENGG.,
COURSE TITLE : THERMAL ENGINEERING
COURSE NO: M-314
DURATION OF EXAMINATION : 3 HOURS.

Hours/Week			MARK	
L	T	P	Theory	Sessional
3	2	0	100	50

UNIT-1

Thermodynamics: Dimensions and units, Basic concepts, Zeroth Law, Temperature scale. First Law of Thermodynamics for closed system and open system, applications, general energy equation for steady flow.

Second Law of Thermodynamics, Reversible and Irreversible processes, Carnot cycle, Clausius theorem, Entropy, entropy change, Clausius inequality, Principle of increase of entropy.

Ideal gases and process calculations.

UNIT-2

Principles of Refrigeration, Vapour compression cycle, Components of Vapour compression systems, COP and related calculations

UNIT-3

BOILERS: Fire tube and Water tube boilers- description and special features, fields of application.

UNIT-4

Properties of steam and process calculations.

Vapour Power Cycles: Carnot's cycle, Rankine cycle, and elementary cycle calculations.

Nozzles: Types, Nozzle efficiency, Critical pressure ratio, Throat and exit areas.

RECOMMENDED BOOKS :

1. Heat Engineering — Vasandani & Kumar--Metropolitan Book Co.
2. Engineering Thermodynamics — Gupta & Prakash--Nek Cahnd
3. Engineering Thermodynamics — PK Nag--Tata McGraw Hill

NOTE : There shall be total Eight questions, Two from each Unit. Five questions have to be attempted selecting at least One from from each Unit. Use of Steam tables, Mollier diagram, Refrigeration tables & charts and a scientific calculator will be allowed in the examination hall.

CLASS: B.E. 3RD SEMESTER
BRANCH: EE/ECE
COURSE CODE: EE-301
TITLE : PRINCIPLE OF ELECTRICAL ENGINEERING
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	50

SECTION-A

Electric Circuit Laws & Energy Sources : Basic electric circuit terminology, Ohm's law, Kirchoff's laws, Circuit parameters (Resistance, inductance & capacitance), series & parallel combination of resistance, inductance & capacitance. Ideal & practical voltage and current sources and their transformation. Dependent voltage sources and dependent current sources.

D.C. Circuit Analysis : Power and energy relations, analysis of series parallel D.C. circuits, Star-Delta transformation, Superposition theorem, Mesh & Nodal methods, Thevenin's theorem, Narton's theorem, Maximum power transfer theorem. Reciprocity Theorem

A.C. Circuit : Basic terminology and definition, Average and effective values of periodic functions, instantaneous and average power, Power factor. Phasor and complex number representation.

SECTION-B

A.C. Circuit Analysis: Solution of sinusoidally excited R, L, C circuits, Applications of Network theorems to A.C. circuits. Resonance in series and parallel circuits; quality factor.

Steady State A.C. 3-Phase Circuits : Concept of 3-phase voltage, Wye (y) circuits, Delta circuits current and voltage relations in Wye and delta circuits. Measurement of power in three phase balanced circuits.

Transformer : Construction, operating principle No-load and On-load vector diagrams, Equivalent circuit, regulation and efficiency calculations, Transformer test (open circuit & short circuit). All day efficiency.

RECOMMENDED BOOKS :

1. Electrical Engineering Fundamentals — V. Del toro
2. Electrical Technology — H.Cotton
3. Electrical Technology — E.Hughes
4. Circuit Theory — A.K.Chakorbarti

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS: B.E. 3RD SEMESTER
BRANCH: EE/ECE ENGINEERING
COURSE CODE: EE-302
TITLE : NETWORK ANALYSIS & SYNTHESIS
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	50

SECTION-A

Conventions for describing networks : Reference directions for currents and voltages, conventions for magnetically coupled circuits, circuit topology.

First order differential equation : Differential equations as applied in solving networks, Application of initial conditions, evaluating initial conditions in networks.

Laplace Transformations : Solution of network problems with Laplace transformation, Heavisides Expansion theorem

Wave Form Analysis & Synthesis : The unit set up, ramp and impulse functions and their Laplace transforms, Initial and final value theorems, convolution integral, convolution as summation.

SECTION-B

Network Functions-poles and zeroes : Ports or terminal pairs, Network functions for one port and two port networks (ladder and general networks), Poles and Zeros of network functions, Restriction on pole and Zero locations for driving point and transfer functions. Time domain behaviour from pole Zero plot.

Two port parameters : Admittance, impedance, transmission and hybrid parameters, Relationship between parameter sets, parallel series & Cascade connection of two port Networks, Characteristics impedance of two port networks.

Filters : Filter fundamentals- pass and stop band, filter classification, constant K & m derived filters, Behaviour of characteristics impedance over pass & stop bands, design of filters.

Network Synthesis : Synthesis problem formulation, properties of positive real functions. Hurwitz polynomials properties of RC, LC and RL driving point, functions. Foster and Cauer synthesis of LC,RL and RC circuits.

RECOMMENDED BOOKS :

1. Network Analysis — Van Valkenberg
2. Network Analysis & Synthesis — F.F. Kuo
3. Introduction to Circuit Synthesis & Design — Temes & La Patra
4. Fundamentals of Network Analysis & Synthesis — Perikari
5. Network Theory & Filter Design — V. Atre
6. Network analysis and Synthesis — Sudhakar Shyam Mohan

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS: B.E. 3RD SEMESTER
BRANCH: EE/ECE ENGINEERING
COURSE CODE: EE-308
TITLE : ELECTRICAL AND ELECTRONICS WORKSHOPS
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Practical
0	0	3	0	50

SECTION-A

Study of Wires & Cables : Study of various type of wiring, Cost estimation for wiring of a single storied building having light & power circuits, Method of earthing & measurement of earth resistance, Electrical shock precautions & treatment, jointing of wires & cables, Soldering of joints, Wiring practices in PVC, Conduit system of wiring, Control of fluorescent lamp circuit power & ordinary circuits suitable for domestic wiring.

SECTION-B

Familiarization with Various Electronic Components : Resistor, Capacitors, Transistors, Diodes IC's, Transformer, Assembly of signal phase, Full wave rectifier circuit with capacitor filter, Assembling the common emitter amplifier circuit, Assembling the following circuit comprising of IC's on a bread board, Like timer circuit using IC 555 & Fabrication on General purpose PCB (to get familiar with soldering techniques).

BOOK RECOMMENDED :

1. Electrical Wiring & Estimation S.I. Uppal

NOTE : The Electronic circuit diagrams will be provided to the students. The operation of the circuits will be explained. The purpose of the exercise is to familiarize the students Fabrication/Assembling of the given Electronic circuits and to solder the different components to form different Circuits.

CLASS: B.E. 3RD SEMESTER
BRANCH: ELECTRONICS & COMMUNICATION ENGG.

	Hours/Week			
COURSE NO: EE-309	**L**	**T**	**P**	**MARK**
COURSE TITLE: BASIC ELECTRICAL ENGINEERING LAB.	**-**	**-**	**3**	**50**

1) Verification of Kirchoff's Laws.
2) Verification of Superposition Theorem.
3) Verification of Thevinin's Theorem.
4) Verification of Reciprocity Theorem.
5) Verification of Maximum Power Transfer Theorem.
6) Measurement of current in various branches of RLC series-parallel circuit.
7) Single phase power measuring by using a Wattmeter.
8) Study of three-phase A.C Circuits with Star and Delta connected Load.
9) Study of single phase transformers. Determination of voltage Ratio, Turns Ratio and Polarity Test. Open circuit and short circuit test of given single phase transformer. Determination of regulation and efficiency.

UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME
FOR B.E. 4TH SEMESTER ELECTRONICS & COMMUNICATION ENGG.
FOR EXAMINATION TO BE HELD FOR BATCH 2014 & ONWARDS

Course		Curriculum Hrs/Week			Marks			
Course No.	**Course Name**	**L**	**T**	**P**	**Theory**	**Sessional**	**Practical**	**Total**
ECE-401	Electronic Devices & Circuits-II	3	2	0	100	40	--	140
MTH-411	Engg. Mathematics-IV	3	2	0	100	40	--	140
COM-411	Object Oriented Programming using C++	3	2	0	100	40	--	140
EE-411	Electrical Machines	3	2	0	100	40	--	140
M-413	Electrical Engg. Material	3	2	0	100	40	--	140
EE-413	Control System Theory & Applications	3	2	0	100	40	--	140
COM-412	Object Oriented Programming Lab	0	0	2/2	---	--	40	40
EE-408	Control System Lab	0	0	2/2	---	--	40	40
EE-412	Electrical Machine Lab	0	0	2/2	---	--	40	40
ECE410	Electronics Devices & Circuits-II Lab	0	0	2/2	---	--	40	40
	Total	**18**	**12**	**06**	**600**	**240**	**160**	**1000**

CLASS: B.E. 4TH SEMESTER
BRANCH: ECE, AEI
COURSE NO: ECE-401
TITLE : ELECTRONIC DEVICES AND CIRCUITS-II
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	40

SECTION-A

TRANSISTOR BIASING : Introduction, Need for Biasing, Type of biasing circuits with necessary derivations, Load line concept (AC & DC), Bias stabilization (S, S' S"), Thermal runway, Bias Compensation Techniques, Numericals.

HYBRID PARAMETERS: Introduction, Two port network, hybrid model for CE, CB, & CC configuration with necessary derivations, Analysis of transistor CE amplifier with & without emitter resistance, Determination of h-parameters from characteristics, Miller theorem, approximation model of h-Parameter, Amplifiers and their analysis using h-parameters.

SECTION-B

SINGLE & MULTISTAGE AMPLIFIERS : Need for cascading, Two stage cascade amplifiers, N-stage cascade amplifiers, Gain of multistage amplifiers in decibels, Techniques for improving input resistance (Darlington transistor, Bootstrap emitter follower amplifiers), Method of coupling multistage amplifiers (RC coupling, DC coupling, transformer coupling), Frequency response of an amplifiers, Effect of emitter & bypass capacitors on the bandwidth & frequency response of a cascaded amplifiers, Square wave testing of an amplifier, Bandwidth of multistage amplifiers.

Feedback Amplifier : Classification of amplifiers, Limitation of basic amplifier, Distortion in amplifier, need for feedback, Feedback concept, Advantages of negative feedback, Ways of introducing negative feedback in amplifiers, Gain with & without feedback, Effect of negative feedback on input, output resistance & bandwidth of the amplifiers, Their respective analysis for feedback amplifiers, Procedure for analysis of feedback amplifiers, Analysis of different Topologies.

BOOKS RECOMMENDED :

1. Integrated Electronics — Millman Halkais
2. Electronics Devices — Bolystead
3. Electronics Devices — Malvino Leach
4. Microelectronics — Sedra & Smith

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS: B.E. 4TH SEMESTER **MARKS**

BRANCH: ECE, EE	L	T	P	Theory	Sessional
COURSE NO: MTH--411	3	2	0	100	40

COURSE TITLE: ENGINEERING MATHEMATICS - IV
DURATION OF EXAM: 3 HOURS

SECTION - A

THEORY OF COMPLEX VARIABLES : Functions of a complex variable, Limits, Continuity, Derivative, Analytic function, Cauchy-Riemann equations, Conformal mappings, Standard Transformation, Bilinear transformation, Line integral, Cauchy's theorem, Cauchy's integral formula, Cauchy's inequality, Liouville's theorem, Taylor and Laurent series expansions, Poles and singularities, Contour integration, Residue theorem, Evaluation of Real Integrals using residue theorem, and Contour integration.

SECTION - B

NUMERICAL METHODS : Definition of operators, Finite and divided difference, Newton's and Lagrange's Interpolation formulas, Numerical differentiation and Numerical integration, Trapezoidal and Simpson's one-third Rule.

Numerical Solutions of Algebraic and Transcendental Equations by Regula Falsi, Newton-Raphson and direct iterative methods, Solution of difference equations, solution of differential equations by Picard's method, Euler's method, Modified Euler's method, Taylor's method, Runge-Kutta method.

BOOKS RECOMMENDED:

01.	Advance Engineering Mathematics	by Jain & Iyengar
02.	Numerical Methods in Engg. & Science	by B.S. Grewal
03.	Difference Calculus (New Edition)	by S.C. Sexena
04.	Engineering Mathematics	by S.S. Sastri

NOTE : There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS: B.E. 4TH SEMESTER
BRANCH: ELECTRONICS & COMMUNICATION ENGG.

COURSE TITLE : OBJECT ORIENTED PROGRAMMING C++	L	T	P	MARKS Theory	Sessional
	3	2	0	100	40

COURSE NO. COM –411
DURATION OF EXAM: 3 HOURS

SECTION - A

1. Review of Pointers: Passing parameters, Array of Pointers, Character Pointers.

Programming Techniques: Unstructured, Procedural, Modular. Introduction to objects, object & cohesion. (30)

2. Overview of C++, Object Oriented programming, Encapsulation, Polymorphism, Inheritance, Console I/O, C++ Comments.

   Classes, Metaclass, Abstract class, Public and private variables, Constructor and Destructor Functions, Constructors taking parameters, Object pointers, In-Line Functions, Automatic Inlining, Friend Functions, This Pointer, New & Delete, Array of Objects. (50)

SECTION-B

1. Function Overloading, Overloading Constructor Functions, Operator overloading, Overloading Binary and Unary Operators, Overloading Relational & logical Operators. (30)
2. Inheritance, Using Protected Members, multiple inheritance, Virtual Base Classes, Introduction to Virtual Functions.

3. C++, I/O Basics, Ifstream, Ofstream, Fstream, Open(), Close(), EOF(), Binary I/O, Get(), Put(), Read (), Write(), Random Access, Seekg(), Seekp(), Tellg(), Tellp(). (20)

BOOKS RECOMMENDED :

1. Turbo C++ by Robert Lafore**.**

REFERENCE BOOKS :

1. Programming in C++ by Balaguruswamy.
2. C++ the Complete Referance by Herbert Schildt.
3. Mastering C++ by K.R. Venugopal & T. Ravishankar & Raj Kumar**.**

NOTE : There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS: B.E. 4TH SEMESTER
BRANCH: ELECTRONICS & COMMUNICATION ENGG.

COURSE TITLE: ELECTRICAL MACHINES	**L**	**T**	**P**	**MARKS Theory**	**Sessional**
COURSE NO. EE –411	**3**	**2**	**0**	**100**	**40**

DURATION OF EXAM: 3 HOURS

SECTION - A

D.C. GENERATORS : Operating principle, constructional features, E.M.F equation, Armature reaction and commutation, operating characteristics losses and efficiency.

D.C. MOTORS : Operating principle, back EMF, Torque equation, Starters, speed control, operating characteristics, and their applications.

TRANSFORMERS : Principle of operation, Vector diagram, Regulation efficiency parallel operation tap changing auto transformer.

SECTION - B

SYNCHRONOUS GENERATORS : Principle of operation, E.M.F equation, Leakage reactance, Vector diagram, Voltage regulation by EMF and MMF method.

SYNCHRONOUS MOTORS : Principle of operation, Vector diagram, V-curves and inverted V-curves, method of starting and their applications.

INDUCTION MOTORS : Principle of operation, TYPES OF MOTORS, Equivalent circuits, Torque and power calculations, No load and blocked rotor test, speed control, Method of starting and their applications.

SPECIAL A.C. MACHINES : Repulsion motors, A.C series motors, Universal motor, single phase induction motor and their applications.

BOOKS RECOMMENDED :

1)	Theory of A.C Machines	A. Langsdrof
2)	Principles of D.C. Machines	Clayson and Hancock
3)	Performance and design of A.C Machines	M.G. Say
4)	Advanced Electrical Technology	H.A. Cotton

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS: B.E. 4TH SEMESTER
BRANCH: ELECTRONICS & COMMUNICATION ENGG.

COURSE TITLE: ELECTRICAL ENGINEERING MATERIALS	**L**	**T**	**P**	**MARKS Theory**	**Sessional**
	3	**2**	**-**	**100**	**40**

COURSE NO. M –413
DURATION OF EXAM: 3 HOURS

UNIT-1

Classification of Engineering materials (with special reference to Electrical and Electronics engineering materials), Engineering requirements of materials.

Crystal structure--space lattice, Bravais lattice, Miller indices of cubic and hexagonal systems, closed-packed plane and directions, Packing in solids, voids, diamond cubic structure, packing in conic solids, crystal imperfections, point defect, line defect, surface defects (in brief).

UNIT-2

Solid solutions, Hume-Rothery rule, phase diagrams, binary phase diagrams, Fe-C phase diagrams, Alloys, alloys transformations, properties of various alloys, applications of Iron –silicon, Iron-nickel and Iron-cobalt alloys, heat treatment processes- annealing, normalizing, hardening, case-hardening etc.

UNIT-3

Conductors, Free electron theory, equation of conductivity, conducting materials, material requirement for contact resistors, precision resistors, thermometers, heating elements, transmission line etc.

Semi-conductors, Band theory, equation for conductivity, zone theory (for explaining energy gaps), types of semi-conductors, semi-conductor materials, method of glowing, technique for producing single crystal, zone referring technique.

UNIT-4

Magnetism, types of magnetisms, dipole moment, domains, ferrimagnetism, anti-ferromagnetism, ferrite magnets, soft and hard magnetic materials and heat treatment cycles.

Dielectric materials, polarization, types, dielectric strength, dielectric losses etc., Piezo-electric effect, ferro-electric materials, optical properties of materials.

RECOMMEENDED BOOKS :

1.	Electrical Engineering Materials	AJ Dekker.
2.	Material Scince and Engineering	V Rahghvan.
3.	Electrical Engineering Materials	PC Kapoor.
4.	Electrical Engineering Materials	NITTTR, Madras

NOTE : There shall be total Eight questions, Two from each Unit. Five questions have to be attempted selecting at least One from each Unit. Use of calculator is allowed.

CLASS: B.E. 4TH SEMESTER **BRANCH: ECE ENGINEERING** **COURSE CODE: EE-413**	**Hours/ Week**			**Marks Distribution**	
	L	**T**	**P**	**Theory**	**Sessional**
TITLE : CONTROL SYSTEMS-THEORY AND APPLICATION	**3**	**2**	**0**	**100**	**40**

DURATION OF EXAM: 3 HOURS

SECTION-A

Introduction to Linear Control System : Control Systems, types of control systems, feedback and its effects, mathematical modeling of physical systems.

System Representation : Block diagrams, representation of control systems, transfer functions, signal flow graphs, polar and Bode plot representation of loop gains of control systems.

Time Domain Analysis of Control Systems : Time domain analysis of 1^{st} & 2^{nd} order Control systems. Typical test signals for time response of control systems, time domain performance of first and second order control systems (steady state response and transient response).

Introduction to compensators : Introduction to phase lead, phase lag & phase lag-lead networks and their applications. Introduction to P, PI and PID controllers.

SECTION-B

Analysis of Linear Feedback Systems : Stability characteristic equation, state transition matrix, stability of linear time invariant systems, Rough-Hurwitz stability Criterion, Root locus plot, Bode plot, Niquest Criterion .

Frequency Domain Analysis of Control Systems : Frequency domain characteristics second order systems relative stability, graphic methods of determining gain margin and phase margin, Nicholas chart.

Control Components : General block diagram of a control system, a.c. and d.c. Servomotors, a.c. tachometer, synchro transmitter and receiver, stepper motor.

Adaptive Control : Introduction, modal reference adaptive control systems, controller structure, self tuning regulators.

Introduction to Modern Control Theory : State equations, State transition Matrix, State transition equations, State diagrams, Concept of controllability and observability.

RECOMMENDED BOOKS:

1. Modern Control Engineering — K.Ogatta
2. Automatic Control Systems — B.C. Kuo
3. Control System Engineering — Nagrath and Gopal
4. Digital Control and State variable methods — M. Gopal

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS: B.E. 4TH SEMESTER	**L**	**T**	**P**	**MARKS**
BRANCH: ELECTRONICS & COMM. ENGG.	-	-	**2/2**	**40**

COURSE TITLE: OBJECT ORIENTED PROGRAMMING LAB.
COURSE NO. COM-412

The Practicals will be based on Computer Languages Theory Syllabus. The students are required to submit at least 10 Programs covering at least 2 programs from each unit

CLASS: B.E. 4TH SEMESTER				
BRANCH: ELECTRONICS & COMM. ENGG.	**L**	**T**	**P**	**MARK**
COURSE TITLE: CONTROL SYSTEM LAB.	-	-	**2/2**	**40**

COURSE NO. EE - 408

1. Transient response of Second order system comprising R.L&C finding therefore maximum overshoot, rise time, settling time, damping factor/ratio natural undamped frequency.
2. Frequency response of a first order and second order system comprising RC, RLC and draw the Bode plots and Nyquist Plots.
3. Transient response of a first, second and higher order Pneumatic servo system.
4. Transient response of a first, second and higher order Hydraulic system.
5. To find the torque speed, torque voltage characteristics of a servo motor and determine its transfer function.
6. Study of synchros, transmitter, receiver and control transformer. Voltage angular wave forms and zeroing.
7. To simulate a second and higher order system on an analog simulator and find its transient response to step, ramp and other input functions.
8. Study of a demonstration servo system (both open & closed) loop comprising error detector, amplifier, a motor cum load having a tachofeed back.
9. Study of phase lag and phase lead networks.

CLASS: B.E. 4TH SEMESTER
BRANCH: ELECTRONICS & COMM. ENGG. **L T P MARKS**
COURSE TITLE: ELECTRICAL MACHINE LAB. - - **2/2** **40**
COURSE NO. EE - 412

1. To study the magnetic characteristics of a D.C. Machines at various operating speeds and finds the operating point of D.C. shunt machine from the same.
2. To determine the load characteristics of a D.C. Shunt generator and find its overall efficiency.
3. To determine the Torque speed characteristics of a D.C. Shunt motor and compound motor
(Short & long shunt). Also study of these using armature control and field control.
4. To study the torque/speed characteristics of a D.C. series motor using various field tappings.
5. To find the efficiency and study various losses of D.C. Machines using Hopkinson test.
6. To study a single phase transformer, its Voltage ratio and turns ratio relationship. Perform open & short circuit test to determine losses, efficiency and voltage regulation and also its various parameters.
7. To perform polarity test on single phase transformers for parallel operation and study the load sharing of two parallel operated transformers.

CLASS: B.E. 4TH SEMESTER **L T P MARK**
BRANCH: ECE, EE, AEI - - **2/2** **40**
COURSE NO: ECE-410
COURSE TITLE: ELECTRONICS DEVICES & CIRCUITS-II LAB
DURATION OF EXAM: 3 HOURS

LIST OF PRACTICALS

1. To study the operation characteristics of the P.N. junction, Ge /Si (Forward & Reverse Characteristics).
2. To study the operation characteristics of Zener diode (Forward & Reverse Characteristics).
3. Half wave Rectifier.
4. Full wave / Bridge Rectifier.
5. To study the operation characteristics (Input/Output) of PNP/ NPN Transistor (Common Emitter/Common Base).
6. To study the frequency response of signal amplifier (CE/CB).
7. To study the characteristics of FET.
8. Determination of h parameter from transistor characteristics.
9. Design of self Bias circuits using BJT.
10. Design of self Bias circuits using FET.

UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME
FOR B.E. 5TH SEMESTER ELECTRONICS & COMMUNICATION ENGG.
FOR EXAMINATION TO BE HELD FOR BATCH 2014 & ONWARDS

Course		Curriculum Hrs/Week			Marks			
Course No.	**Course Name**	**L**	**T**	**P**	**Theory**	**Sessional**	**Practical**	**Total**
ECE-501	Electronic Devices & Circuits-III	3	2	0	100	40	--	140
ECE-502	Communication Engg.-I	3	2	0	100	40	--	140
ECE-503	Digital Electronics	3	2	0	100	40	--	140
ECE-504	Linear Integrated Circuits	3	2	0	100	40	--	140
ECE-505	Random Process & Noise	3	2	0	100	40	--	140
EE-511	Transmission & Distribution of Electrical Power	3	2	0	100	40	--	140
ECE-511	Electronics Devices & Circuits-III Lab	0	0	2	---	--	40	40
ECE-512	Digital Electronic Lab	0	0	2/2	---	--	40	40
ECE-513	Linear Integrated Circuits Lab	0	0	2	---	--	40	40
EE-512	Transmission & Distribution of Electrical Power Lab	0	0	2/2	---	--	40	40
Total		**18**	**12**	**06**	**600**	**240**	**160**	**1000**

CLASS: B.E. 5TH SEMESTER
BRANCH: ECE, AEI
COURSE CODE: ECE-501
TITLE: ELECTRONIC DEVICES AND CIRCUITS-III
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	40

SECTION-A

Sinusoidal Oscillators : Introduction, Necessity of oscillator, Gain with feedback, Barkhausein criteria, Requirements of oscillator, Types of oscillators, RC oscillators & phase shift oscillators, Wien bridge oscillators, LC oscillators, with necessary derivations to determine gain required for oscillation & frequency of oscillation, Amplitude & frequency stability of oscillators, Crystal oscillators, Multivibrators: Monostable, Astable, Bistable, (with necessary derivations), using transistors.

Tuned and Power Amplifiers : Introduction, General features of power transistor, Difference between power transistor & a voltage amplifier, Need for power amplifier, Classification of power amplifiers with necessary load lines concept & derivations (Efficiency, power dissipation), Class A, B & AB amplifier, their types & analysis, Cross over distortion & its remedy, Determination of harmonic distortion, Heat sinking for power transistor, Monolithic power amplifier, Tuned amplifier-Introduction, Classification of tuned amplifiers (single tuned & double tuned) with respective analysis.

SECTION-B

Voltage Regulators : Introduction & necessarily of voltage regulators, Difference between unregulated & regulated power supply, Factor affecting unregulated power supply, Stabilization, Basic representation of voltage regulators Type of voltage regulators-series & shunt voltage regulators, Series voltage regulators using emitter follower & its expressions for Sv & Ro, Preregulators, Short circuit protection-simple & fold back current limiting, Zener regulators, & its analysis, Monolithic & IC regulators(78XX,79XX,LM317,LM337) and design, Switching Regulator

Transistor at High Frequencies : Introduction, Hybrid (Pie) model, Relation between hybrid pie & h-parameters, Validity of hybrid-pie-model, Variation of hybrid-pie-parameters, Current gain with & without resistive load, Gain bandwidth product, Single stage CE transistor amplifiers response, Emitter Follower at high frequency, Common Drain amplifier at high frequency.

BOOKS RECOMMENDED :

1. Integrated Electronics — Millman Halkias
2. Electronics Devices — Boylstead
3. Electronics Devices — Malvino Leach
4. Microelectronics — Sedra & Smith

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS: B.E. 5TH SEMESTER
BRANCH : ECE
COURSE NO: ECE-502
COURSE TITLE : COMMUNICATION ENGG- I
DURATION OF EXAM: 3 HOURS

	L	T	P	MARKS Theory	Sessional
	3	2	0	100	40

SECTION-A

AM Modulation : Introduction to Elect. Comm. System, Concept & need for modulation, Definition of signal to noise ratio & noise figure, periodic & non-periodic signals, Spectral analysis of signal- Fourier series & Fourier Transforms, Representation of AM, Frequency spectrum of AM wave, Power relation in AM wave, Modulation & Demodulation of AM, SSB techniques, Balanced modulator, Type of SSB including VSB, ISB, Modulation & Demodulation of SSB signals.

Angle Modulation : Theory of FM, Representation & frequency spectrum of FM, Pre-Emphasis, De-Emphasis, Wide band & Narrow band FM, Generation & detection of FM signal, Comparison with PM & AM.

Receiver : TRF receivers, Superhetrodyne receiver, Receiver characteristics- sensitivity, selectivity, Image frequency & its Rejection, Double spotting.

SECTION-B

Pulse Modulation : Techniques, sampling theorem, Natural & flat top sampling, principle, generation & detection of PAM, PWM, PCM, DM, ADM, Time division multiplexing, Frequency division multiplexing.

T.V. Engg : Element of a T.V systems, Pick up & Display tube of monochrome T.V Image Continuity-Interlace scanning, VSB modulation & its need in T.V. system. Essential of colour T.V. Three colour theory, Luminance Hue & saturation, Pick up (i.e Camera) & Display tube of colour T.V system.

BOOKS RECOMMENDED :

01. Electronics Comm. System — By G. Kennedy
02. Principles of Comm. System — By Taub & Schilling
03. Monochrome & Coloured T.V. — By R.R. Gulati

REFERENCE BOOK :

Communication System — By Simon Haykins

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: B.E. 5TH SEMESTER
BRANCH: ECE / EE
COURSE NO: ECE-503
COURSE TITLE: DIGITAL ELECTRONICS
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	40

SECTION-A

Number System, Radix conversion, Arithmetic with base other than ten, Data representation–fixed & floating points, Binary codes – weighted/Non weighted codes, Error detecting & correcting code (Hamming code), Alphanumeric code, Subtraction of signed/unsigned number.

Logic Gates, Boolean algebra, Simplification of Boolean expressions, Minimization techniques, Karnaugh map (up to five variables), Simplification of Logic families – RTL, DTL, TTL, ECE & MOS families and their characteristics.

SECTION-B

Combinational logic circuits: Half and Full adders, Subtractors, BCD Adder, Comparators, Multiplexer, Realization of function using MUX, Demultiplexer, Decder, Encoder, Code converters, General problems, PLA, Design of combinational circuit using PLA & PAL.

Introduction to sequential logic circuits, Synchronous and Asynchronous operation, Flip-Flops– R-S, J-K, D, T & Master-Slave flip-flop, Conversion of flip-flops, Shift registers, Analysis of asynchronous & synchronous sequential counter, Design of sequential logic circuits, Problem formulations, State minimization techniques.

NOTE : There shall be total 8 questions, four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

Books Recommended :

01. Digital Electronics — By R.P Jain

02. Digital Electronics & Microcomputer — By R.K. Gaur

03. Computer System Architecture — By M.M. Mano

04. Digital Electronics — By Jamini & K.M. Backward

CLASS: B.E. 5TH SEMESTER
BRANCH : ECE/AEI
COURSE CODE : ECE-504
TITLE: LINEAR INTEGRATED CIRCUITS
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	40

SECTION-A

Basic Operational Amplifiers : Basic differential amplifiers, Its working & types, Transfer characteristics, Small Signal analysis of differential amplifier, using h-parameter, Differential Gain & Common-Mode Gain, Constant Current basic circuit, Constant Current source/Current mirror circuit, Level shifting techniques, Active load, Output stage.

Ideal & Practical Op-Amp & Characteristics : Block diagram, characteristics of ideal & practical operational amp, Ideal voltage transfer curve, Open loop Op-amp configurations, Op-Amp as inverting, Non-inverting amplifier, Differential amplifiers using one and two Op-Amp, Op-amp Characteristics, Measurement of Op-amp parameters, Offset voltage compensating N/W, Frequency response of internally compensating Op-amp, High frequency Op-Amp equivalent circuit, Open loop & close loop frequency response, Circuit Stability, Slew rate and its cause.

SECTION-B

Op-Amp & Applications : DC & AC Amplifier, AC amplifier with single power supply, Peaking amplifier, Summing, Scaling & Averaging amplifiers using inverting/Non-inverting Configurations, Differential input / Differential output amplifier, High input impedance circuit, Active filters, Integrator, Differentiator, Instrumentation amplifier,

Op-Amp circuits and Waveform generators : Square, Triangular, Saw tooth, Sine wave generator, Op-amp, as clipper, Clamper & comparator circuits, Sample and hold circuit, Comparator characteristics, Voltage limiter, Peak detector, comparators, zero crossing detector, Schmitt trigger, Digital to Analog Converter, Binary Weighted Resistor, R-2R Resistor type D/A Converters, A/D Converters & its types; Dual slope, Successive approximation & Counter type A/D Converter

Phase-Locked Loops & 555 Timers : Block diagram, Operations and their applications

BOOKS RECOMMENDED :

1. Op-Amp & Linear Integrated Circuit — Ramakant A. Gayakwad
2. Linear Integrated Circuit — Wixer
3. Linear Integrated Circuit — Tobey Graeme & Huelsomen
4. Op-Amp Design Application — Dailey
5. Design with Op-Amp — Franco

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

	Hours/ Week			Marks Distribution	
CLASS: B.E. 5TH SEMESTER					
BRANCH: ECE	**L**	**T**	**P**	**Theory**	**Sessional**
COURSE NO: ECE-505					
COURSE TITLE: RANDOM PROCESSES & NOISE	**3**	**2**	**0**	**100**	**40**
DURATION OF EXAM: 3 HOURS					

SECTION-A

Spectral Analysis : Fourier series, Representation of Signal & System, Sampling function, Response of a linear system, Normalised power, Power spectral, Density, Fourier transform, convolution, Perseval's theorem, Correlation (Auto & cross)

Random Variable & Processes : Probability, Random variable, Probability density function, Variance, Tchebvcheff's inequality, Gaussian probability density, Rayleigh probability density, Correlation between random variable, Central-limit theorem, random process.

SECTION-B

Noise : Source of Noise, Type of Noise, Frequency domain representation of Noise, Superposition of Noise, Mixing involving Linear filtering, noise effect of a filter on spectral density of Noise, Noise bandwidth, quadrature components of Noise, Resistor Noise, Noise temperature, Noise filter, Probability of error, Optimum filter, White Noise, The matched filter, Probability of error of the matched filter.

Information Theory : Discrete Messages, The concept of amount of information, Entropy, Source coding:Shannon Fano algorithm and Hoffman coding Shannon's theorem, Channel-Capacity, Bandwidth & S/N tradeoff, information rate, Capacity of a Gaussian channel.

NOTE : There shall be total 8 questions, four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

BOOK RECOMMENDED :

01.	Principle of Communication System	Taub & Shilling
02.	Communication System	Lathi
03.	Communication System	Haykin

REFERENCE BOOK :

01.	Random Process	Peebles
02.	Communication System	Singh & Sapre

CLASS: B.E. 5TH SEMESTER
BRANCH : ELECTRICAL ENGINEERING
COURSE CODE: EE-511
TITLE : TRANSMISSION AND DISTRIBUTION OF ELECTRICAL POWER
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	40

SECTION-A

D.C. & A.C. Distribution Systems : Introduction to a Power System (an overall view).Distribution systems- Feeder, Distributors, service mains. Classification of distribution system, various types of D.C. and A.C. distributors .Voltage drop calculations.

Transmission lines : Types of conductors, bundling of conductors, skin effect, proximity effect. Inductance and capacitance of single phase, 3-phase, single circuit and double circuit lines.

Insulators : Materials for insulators, types of insulators, potential distribution over a string of suspension insulators, methods for equalizing the potential.

SECTION-B

Cables : Insulating materials for cables, classification of cables, insulation resistance and capacitance of single core cable. Dielectric stress, grading of cables, capacitance of 3- core cables, current carrying capacity of underground cables, methods of laying of underground cables.

Corona : Visual and critical disruptive voltage, conditions effecting corona, power loss due to corona, practical consideration.

Sub-stations : Types of substations, key diagrams.

RECOMMENDED BOOKS:

1. Electric Power System — C.L. Wadhwa
2. Transmission and distribution of Electrical Energy — H. Cotton
3. Elements of power system Analysis — W.D. Stevenson
4. Modern Power System Analysis — Nagrath & Kothari
5. A Course in Electrical Power — Soni,Gupta and Bhatnagar

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS: B.E. 5TH SEMESTER
BRANCH: ECE/AEI
COURSE NO: ECE-511
COURSE TITLE: E.D.C LAB
DURATION OF EXAM: 3 HOURS

L	T	P	PRACTICAL
0	0	2	40

LIST OF PRACTICAL :

01. Determination of voltage gain, Input/output resistance of amplifiers using with & without feedback.
02. Determination of Distortion output power in case of push pull class-B amplifier.
03. Determination of frequency response of class-C tuned amplifier.
04. Study of signal stage class-A power amplifier & determine output power & efficiency.
05. Study of complimentary symmetry push pull amplifier.
06. Design & determination of stability factor series of zener shunt Regulator / IC Regulator.
07. Design of voltage regulator using series pass transistor.
08. Study of Collpitt, Clapp, Hartley, Wein bridge, Phase regulator & Determine the frequency of output waveform.

CLASS: B.E. 5TH SEMESTER
BRANCH : ECE/EE
COURSE NO: ECE-512
COURSE TITLE : DIGITAL ELECTRONIC LAB
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Practical
0	0	2/2	0	40

LIST OF PRACTICAL :

01. Verification of truth tables of logical gates AND / OR / NOT, NAND, NOR, EXOR, EXNOR, gates.
02. Implementation of Boolean expression using AND, OR, NOT, NAND, & NOR logic.
03. Implementation of Decoder, Encoder using IC's & gates.
04. To implement half adder, half subtractor, full adder, full subtractor using different IC's & gates.

05. Implementation of multiplexer, Demultiplexer using IC's & gates.
06. Design of BCD to seven segment display using logical gates & IC's.
07. To design & verification of truth table of SR, JK, MS-JK Flip Flops.
08. To design various asynchronous counters using flip flops, gates & IC's.
09. To design various synchronous counters using flip flops, gates & IC's.
10. To design & verify the Truth tables of shift Registers.

CLASS: B.E. 5TH SEMESTER
BRANCH: ECE
COURSE NO: ECE-513
COURSE TITLE: L.I.C LAB
DURATION OF EXAM: 3 HOURS

L	T	P	PRACTICAL
0	0	2	40

LIST OF PRACTICAL :

01. Design of OP-amp as closed loop Inverting, Non-Inverting, amp voltage follower & Inverter.
02. Design of Op-Amp as summer, Scaling, Averaging using Inverting amplifier & Non-Inverting amplifier.
03. Design & study of Op-Amp as clipper, clamper circuit.
04. Design of Op-Amp as Square wave generator.
05. Design of Op-Amp as Integrator & Differentiator.
06. Design of Op-Amp as low pass filter & high pass filter.
07. Design of IC 555 timer as Monostable, Multivibrator & Astable Multivibrator.
08. Study of IC – LF 398 N sample & hold circuit & show the waveform on CRO.
09. Design of OP-Amp as Schmitt trigger.

CLASS: B.E. 5TH SEMESTER
BRANCH : ELECTRICAL ENGINEERING
COURSE CODE : EE-512
TITLE : TRANSMISSION AND DISTRIBUTION OF ELECTRICAL POWER LAB

Hours/ Week			Marks Distribution	
L	T	P	Theory	Practical
0	0	2/2	0	40

LIST OF EXPERIMENTS:

1. Performance Characteristics of a Short Transmission Line.
2. Performance Characteristics of a Medium Power Transmission Line.
3. Performance Characteristics of a long Power Transmission Line.
4. Study of all types of Overhead Line Conductors.
5. Study of all types of Overhead Line Insulators.
6. Study of Corona formation of High Voltage Overhead Lines.
7. Steady of all types of under ground Cables.

UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME
FOR B.E. 6TH SEMESTER ELECTRONICS & COMMUNICATION ENGG.
FOR EXAMINATION TO BE HELD FOR BATCH 2014 & ONWARDS

Course		Curriculum Hrs/Week			Marks			
Course No.	**Course Name**	**L**	**T**	**P**	**Theory**	**Sessional**	**Practical**	**Total**
ECE-601	Microprocessor (8085) & Peripheral Interfacing	3	2	0	100	40	---	140
ECE-602	Digital Signal Processing	3	2	0	100	40	---	140
ECE-603	Communication Engg.-II	3	2	0	100	40	--	140
ECE-604	Microwave Devices & Systems	3	2	0	100	40	--	140
ECE-605	Electronics Measurement & Instrumentation	3	2	0	100	40	--	140
EE-603	Power Electronics	3	2	0	100	40	---	140
ECE-606	Microprocessor (8085) & Peripheral Interfacing Lab	0	0	2/2	---	---	30	30
ECE-607	Communication Lab	0	0	2/2	---	---	30	30
EE-606	Power Electronics Lab	0	0	2/2	---	---	30	30
ECE-608	Microwave Devices & systems Lab	0	0	2			40	40
ECE-609	Electronics Measurement & Instrumentation Lab	0	0	2/2			30	30
	Total	**18**	**12**	**06**	**600**	**240**	**160**	**1000**

CLASS : B. E. 6TH SEMESTER
BRANCH : ECE / EE / AEI
COURSE NO : ECE-601
COURSE TITLE : MICROPROCESSOR (8085) & PERIPHERAL INTERFACING
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Practical
3	2	0	100	40

SECTION-A

1. Microprocessor 8085 pin diagram, Architecture, Addressing modes, Instruction set, Instruction format, Timing diagram, Programming techniques with additional instructions, looping, Counting design of counters & time delays, debugging & memory mapping.
2. Stack & Subroutines, Advanced subroutines concept, Call & Ret instructions, Advanced programming (Code conversions, BCD addition/subtraction, Multiplication etc), 8085 interrupts & process….

SECTION-B

1. Interfacing I/O devices, Basic interfacing concept, Interfacing with scanned multiplexed displays & LCD's, Interfacing output displays, Interfacing i/p devices, Memory mapped i/o design, Memory wait states & access time.
2. Serial I/O data communication, Basic concepts in serial I/O, 8085 serial I/O lines – SID & SOD, Synchronous & asynchronous data communication, Software controlled asynchronous serial I/O.
3. Interfacing to 8085 Microprocessor: PPI – 8155 I/O & timer, PPI – 8255 (mode-0, 1, 2 & BSR), PID 8279 keyboard/display interface, PIC 8259, DMA controller 8257/8237.

NOTE : There shall be total 8 questions of 20 marks each four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

BOOKS RECOMMENDED :

01.	Microprocessor Architecture Programming & App.	By Ramesh Gaonkar
02.	Introduction to Microprocessor	By Aditya P. Mathur
03.	The Intel Microprocessor	By Brey
04.	Fundamental of Microprocessor & Microcomputers	By B. Ram
05.	Microprocessor and Interfacing	By D.V. Hall

CLASS : B. E. 6TH SEMESTER
BRANCH: ECE/AEI
COURSE NO: ECE-602
COURSE TITLE: DIGITAL SIGNAL PROCESSING
DURATION OF EXAM: 3 HOURS

			MARKS	
L	T	P	Theory	Sessional
3	2	0	100	40

SECTION-A

Discrete Time Signal & System :

Introduction, Classification of discrete time signal, Discrete time system, Frequency domain representation, Analysis of linear time Invariant system, Properties of LTI system, System described by difference equations, Correlation of discrete time system, Recursive & Non-recursive structures, Realization of Digital linear systems.

The Z-Transform :

Introduction, Defination,Properties of Z-Transform, Evaluation of the Inverse Z-Transform, Realisation of Digital Linear Systems.

SECTION-B

Discrete & Fast Fourier Transform :

Introduction, Properties of DFT, Linear convolution using DFT, Circular convolution, Discrete time Fourier transform (DTFT), Fast fourier transform (FFT), FFT Algorithms–Decimation in time FFT algorithms & decimation in frequency algorithms, Computational consideration.

Digital Filter Design :

Generation consideration, Design of FIR filter, Design of IIR filter-Impulse Invariant method, Bilinear transformation Application of DSP, Radar, Image processing.

NOTE : There shall be total 8 questions of 20 marks each four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

BOOKS RECOMMENDED :

01. Digital Signal Processing by S. Salivaharan

02. Digital Signal Processing by John G. Proakes

03. Digital Signal Processing by O.P. Verma

CLASS : B. E. 6TH SEMESTER
BRANCH : ECE
COURSE NO : ECE-603
COURSE TITLE : COMMUNICATION ENGG.-II
DURATION OF EXAM : 3 HOURS

	L	T	P	MARKS Theory	MARKS Sessional
	3	2	0	100	40

SECTION-A

1. **Digital Modulation Techniques :** Introduction, Types of digital modulation techniques, FSK, ASK, BPSK, DPSK, QPSK generation and reception, Differentially encoded PSK (DEPSK), M-ray PSK, MSK, Comparison of digital modulation techniques.
2. **Spread Spectrum Modulation :** Introduction, DS spread spectrum, CDMA, Frequency hopping spread spectrum, Generation of PN sequences, Acquisition & tracking of a FH & DS signal.

SECTION-B

1. Introduction to Linear block code – hadamard, Hamming code, Convolution codes – code tree, Trellis & state diagram for a convolution encoder, Decoding method of convolution code – viterbi algorithm.
2. **Telephone Switching Systems :** Dialling Techniques, Classification of switching systems, Central switching, Traffic load, Grade of service Switching matrices, Time Division multiplexed switch, Time slot Intercharge, Combination time & space switch.

NOTE : There shall be total 8 questions of 20 marks each four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

Text Books :

01.	Principle of Communication Systems	By Taub & Schilling
02.	Digital Communication	By Das, Mullick & Chaterjee
03.	Telecommunication switching systems and Networks	By T. Vishwanathan

Reference :

01.	Analog & Digital Communication	By Simon Haykins

CLASS : B. E. 6TH SEMESTER
BRANCH: ECE
COURSE CODE: ECE-604
TITLE: MICROWAVE DEVICES & SYSTEMS
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	40

SECTION-A

Waveguides : Frequency allocations and frequency plans, Rectangular waveguide and its mathematical analysis, Power Transmission, Circular waveguide and its mathematical analysis, modes of propagation, dominant modes, cut off wavelength, excitation modes.

Microwave passive devices : Scattering matrix of microwave junction, cavity resonators, E-plane tee, H-plane tee, magic tee, phase shifters, attenuators, directional couplers, ferrite devices, Faraday rotation, gyrator, isolator, circulators and detector.

Microwave generators and amplifiers : limitations of conventional tubes, reflex klystron, two and multi cavity klystron amplifiers and oscillators, backward wave oscillators, Magnetrons, cross field amplifiers & the MASER.

SECTION-B

Microwave solid-state devices : Gunn diode and its modes of operation, Avalanche IMPATT diode, TRAPATT diode,Tunnel diode, Schottky diode, Backward diode, Varactor diodes, PIN diode

Microwave Link : Microwave radio station**,** microwave transmitter and receiver, multiplexing equipment, microwave link.

Microwave Measurements : Measurement of standing wave ratio, measurement of frequency, measurement of power, phase shift, attenuation, antenna pattern measurement.

Micro-Strip Lines : Introduction, Micro strip lines, parallel strip lines, coplanar strip lines, shielded strip lines, characteristic impedance of micro strip lines, losses in micro strip lines, quality factor of micro strip lines.

RECOMMENDED BOOKS :

1. Foundations for Microwave Engineering — R E.Collins
2. Microwave Devices and Circuits — Samuel Y Liao.
3. Microwave and Radar Engineering — M Kulkarni
4. Microwave Engineering — David M. Pozar
5. Microwave Engineering — A Das and S K Das
6. Microwave Engineering — Rajeswari Chatterjee
7. Microwaves — M.L.Sisodiya and Vijay Laxmi Gupta

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed

CLASS : B. E. 6TH SEMESTER
BRANCH: ECE
COURSE NO: ECE-605
COURSE TITLE: ELECTRONIC MEASUREMENT & INSTRUMENTATION
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	40

SECTION-A

Measurement & Error: Introduction to Measurement & Instrumentation, Types of instrumentation & measurement, Sensitivity, resolution, Accuracy, Precision, significant figures, Absolute & relative errors, Types of errors, Probability of errors, Limiting errors, Linearity.

Analog Instruments : Analog multimeter, Analog voltmeter, Analog ammeter, Analog ohmmeters & their design analysis, Ac voltmeter using rectifiers, True RMS responding voltmeter, Wave analyzers, (simple & heterodyne), Harmonic distortion analyzer (Tuned circuits heterodyne), Loading effect of voltmeter, Electronic multimeter,

Digital Instruments : Digital voltmeter, Digital multimeter, Digital LCR & measurements, Special frequency meters & application, Shielding & grounding, Q meter, Vector impedance meter, Vector voltmeter, RF power & Voltage measurement.

SECTION-B

Oscilloscopes : Block Diagram, CRT, Probes, Deflection amplifier & delay line, Automatic time base, Dual trace Oscilloscope, Sweep modes, Measurement of voltage, Frequency & phase pulse measurement,

Special Oscilloscope : CRT storage target characteristics, Sampling Oscilloscope, Digital storage Oscilloscope, Spectrum analysis.

Transducers : Introduction, Selection of transducers, Resistive transducers, Strain gauges, Thermistor & thermometer, LVDT, Load cells, Piezo Electric transducers, Photo voltaic, Frequency generation transducer.

Bridge : Introduction, Wheat stone bridge, Kelvin bridge, Guarded wheat stone bridge, AC bridge & their application, Maxwell bridge, Hay bridge, Schering bridge, Wagner ground connection, Unbalance conditions.

NOTE : There shall be total 8 questions, four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

BOOKS RECOMMENDED :

01. Electronic Instrument & Measurement Technique — By Copper W.D & Helfric A.

02. Electrical & Elect. Measurement Instrumentation — By A.K.Sawhney

03. Electronic instrumentation — By H.S. Kalsi

REFERENCE BOOK :

Electronic Instrumentation & Measurement — By Oliber B.M & Cage J.M**.**

CLASS : B. E. 6TH SEMESTER
BRANCH: EE/ECE ENGINEERING
COURSE CODE: EE-603
TITLE: POWER ELECTRONICS
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	40

SECTION-A

Concept of Power Electronics, Applications, Advantages and disadvantages. Power electronic system and devices.

Solid state devices : SCR: Basic theory of operation, characteristics: Static and Dynamic, SCR ratings, Protection of SCR against over current, over voltage high dV/dt, de/dt. Snubber circuit, series and Parallel operation of SCR. Gate protection. Firing circuits of SCR. SCR gate characteristics, Two-transistor analogy of SCR. Thyristor family: SCR, TRIAC, DIAC, GITO, PUT, LASCR

Classification of Rectifiers, Phase Controlled rectifiers : Single phase and three phase, half wave and full wave fully controlled and half controlled rectifiers with R, L, E loads with and without free wheeling diodes.

SECTION-B

Methods of commutation.

AC phase control : Operation of Single phase, Half and full wave AC controller with R, R-L Load, Integral cycle control, sequence control.

Choppers : Principles and basic ckt. Operation, classification, steady state analysis, Control strategies. Communication in chopper circuits.

Inverters : Single phase voltage source Inverters, Voltage control of single phase inverters.

Cycloconverters : Classification, single phase to single phase cycloconverters with resistive inductive load.

RECOMMENDED BOOKS :

1. Power Electronics — PS Bhimbra,
2. Power Electronics — MD Singh and KB Khanchandani
3. Power Electronics — AF Gupta and LP Singh
4. Fundamental of Power Electronics — Rama Reddy
5. Power Electronics Converters, Applications & Design — Mohan, Undeland and Robbins
6. Advanced Power Electronics — B.K.Bose

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS : B. E. 6TH SEMESTER
BRANCH : ECE/EE/AEI
COURSE NO : ECE-606
COURSE TITLE : MICROPROCESSOR (8085) & PERIPHERAL INTERFACING LAB

Hours/ Week			Marks Distribution	
L	T	P	Theory	Practical
0	0	2/2	0	30

LIST OF EXPERIMENT :

01. Programs of data transfer group and block transfer of data from Source memory to destination memory.

02. Programs on Arithmetic, Logical group of instruction, Multiplication of two unsigned 8 bit number & factorial of a number.

03. Programs on time delay & counters.

04. Advanced programming such as binary to ASCII, Vice versa & BCD addition.

05. Study of 8255-PPI interfacing card, 8257-DMA controller interfacing card, 8259-PIC interfacing card, 8253-Timer & counter interfacing card.

CLASS : B. E. 6TH SEMESTER
BRANCH: ECE
COURSE NO: ECE-607
COURSE TITLE : COMMUNICATION LAB

L	T	P	PRACTICAL
0	0	2/2	30

LIST OF EXPERIMENTS :

01. To plot the response of RF Tuned Amp.

02. To find the modulation index of AM signal.

03. Hardware realization of AM demodulation circuit.

04. Hardware realization of FM modulation circuit using IC 8038.

05. To plot the response of IF transformer.

06. Hardware realization of sample & hold circuit.

07. Hardware realization of ASK modulation circuit.

08. Study of PCM & TDM signal.

CLASS : B. E. 6TH SEMESTER
BRANCH: EE/ECE
COURSE CODE: EE-606
TITLE: POWER ELECTRONICS LAB

Hours/ Week			Marks Distribution	
L	T	P	Theory	Practical
0	0	2/2	0	30

LIST OF EXPERIMENTS :

1. SCR Triggering circuits.
2. Forced Commutation Circuits in Converters.

3. SCR Phase Control Circuits.
4. Triac Phase Control Circuits.
5. Fully Controlled Single - Phase thyristor bridge.
6. SCR DC Circuit breaker.
7. Zero Voltage switching.
8. Voltage Commutated DC chopper.
9. Current commutated DC chopper.
10. Microprocessor based three – phase thyristor bridge.
11. Series connected single – phase converters.
12. Series inverters.
13. Converter fed drive.
14. Chopper fed drive.

CLASS : B. E. 6TH SEMESTER
BRANCH: ECE
COURSE NO: ECE-608
COURSE TITLE: MICROWAVE DEVICES & SYSTEM LAB

Hours/ Week			Marks Distribution	
L	T	P	Theory	Practical
0	0	2	0	40

LIST OF PRACTICAL :

01. To study and draw the following characteristics of Reflex Klystron.
02. To determine the frequency and wave length in Rectangular wave guide.
03. Determine the standing-wave ratio & reflection coefficient.
04. To measure an unknown impedance with smith chart.
05. To study the following characteristics of Gunn diode.
    i. V-I Characteristics.
    ii. Output power & frequency as a function of voltage.
06 To drawn the Radiation pattern of a Horn Antenna.
07 To calculate the Coupling Factor & directivity using a directional coupler.
08 To study the following Tees :-
    i) E-Plane Tee.
    ii) H-Plane Tee.
09 Study of Magic Tee to study the Isolator & Circulators.

CLASS : B. E. 6TH SEMESTER
BRANCH : ECE
COURSE NO : ECE-609
COURSE TITLE: ELECTRONIC MEASUREMENT & INSTRUMENTATION LAB
DURATION OF EXAM : 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Practical
0	0	2/2	0	30

LIST OF PRACTICAL :

01. Study of analog multimeter (Voltmeter, Ammeter, & Current meter)

02. Study of Rectifier type instruments
03. Study of Analysers (Wave, Spectrum & Distortion)

04. Study of Digital multimeter

05. Study of LCR Q meter

06. Study of frequency meter

07. Study of Oscilloscope, Measurement of frequency, Phase, Amplitude using lissajous pattern, Digital storage & Sampling Oscilloscope

08. Study of Transducers: LVDT, Strain, RTD, Thermocouple, Load cell, Photo voltage & Frequency generation transducers

09. Study of Bridge: wheat stone, Kelvin, AC bridge

UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME
FOR B.E. 7TH SEMESTER ELECTRONICS & COMMUNICATION ENGINEERING
FOR EXAMINATION TO BE HELD FOR BATCH 2014 & ONWARDS

Course No.	Name of the Course	Hours Per Week			Marks			
		L	T	P	Theory	Sessional	Practical	Total
ECE-701	Microprocessor (8086) & Applications	3	2	--	100	50	--	150
ECE-702	VLSI Design & Technology	3	2	--	100	50	--	150
Elective-I ECE-703	(A) Wireless Communication (B) Computer Networks & Communication	3	2	--	100	50	--	150
HUM-711	Industrial Management	3	2	--	100	50	--	150
ECE-704	Industrial Training	--	--	--	--	--	50	50
ECE-705	Minor Project	--	--	6	--	--	150	150
ECE-706	Seminar	--	--	4	--	--	100	100
ECE-711	Microprocessor (8086) & Applications Lab.	--	--	2	--	--	30	30
ECE-712	VLSI Lab	--	--	2	--	--	40	40
ECE-713	Matlab Programming	--	--	2	--	--	30	30
Total		**12**	**08**	**16**	**400**	**200**	**400**	**1000**

NOTE : Students have to select one course from Elective-I

CLASS: BE 7TH SEMESTER
BRANCH: ECE/AEI ENGINEERING
COURSE NO: ECE-701
COURSE TITLE : MICROPROCESSOR (8086) & APPLICATIONS
DURATION OF EXAM: 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	50

SECTION-A

Microprocessor 8086 pin diagram, Architecture, Instruction format & set, Introduction to assembly language programming & techniques, 8086 string instructions & programming, Passing parameters using procedures & macros, Nested procedures & macros, Assembler directives.

8086 Timing diagrams, 8086 interrupts, 8086 in minimum & maximum mode configuration, Bus connection & its remedy, closely & loosely coupled configuration.

SECTION-B

8087 math coprocessor, Pin diagram, Architecture, Instruction set, Interfacing to 8086, Introduction to 8089 I/O processor, Pin diagram, Architecture, Instruction set, Interfacing with 8086, Data sharing through memory management.

Interfacing 8255 with 8086, Interfacing of 8279 with 8086, Interfacing of USART 8251 with 8086, Memory interfacing with 8086.

Introduction, Architecture, Pin diagram of Usart-8251, 80286, 80386, 80486 & Pentium processor, Use of RISC & CISC instructions.

BOOKS RECOMMENDED :

01. Microprocessor & Interfacing Programming by Douglas V Hall
02. Microprocessor Architecture & Programming by Ramesh Gaonkar
03. Microprocessor Systems by Liu Gibson
04. The Intel Microprocessor by Brey

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS : BE 7TH SEMESTER
BRANCH : ELECTRONICS & COMMUNICATION
COURSE NO : ECE-702
COURSE TITLE : VLSI DESIGN & TECHNOLOGY
DURATION OF EXAM: 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	50

SECTION-A

MOS Technology: NMOS fabrication and CMOS fabrication using N-Well, P-Well & Twin-Tub processes, VLSI Design flow-Design specification, Design Entry, Final Simulation.

Basic VHDL and Verilog HDLs codes: logic gates, 2 to 4 line decoder, 4 to 1 multiplexer, half adder, full adder, half substractor, full substractor, 4-bit adder, 4-bit gray to 4-bit binary converter and 2-bit comparator.

MOSFET: Structure and operation, Current voltage characteristics, MOSFET scaling, Layout design rules, CMOS inverter layout design.

SECTION-B

CMOS Inverter: CMOS inverter operation, Design of CMOS inverter, Switching characteristics of CMOS inverter, Calculation delay times, Switching power dissipation of CMOS inverter.

Simple Combinational CMOS logic circuits: Logic Gates, transmission gate, 2 to 1 Multiplexer, Half Adder and Full Adder.

Simple Sequential CMOS logic circuits: Latch circuits and flip flops.

RECOMMENDED BOOKS :

01.	Basic VLSI Design	Douglas A. Pucknell & K. Eshraghian
02.	Principles of CMOS VLSI Design	Neil H.E Weste & K. Eshraghian
03.	VLSI Fabrication Principles	S.K. Gandhi
04.	VLSI Technology	S.M. Sze
05.	Circuit Design for CMOS VLSI	J.P. Uyemura
06.	CMOS Digital ICs Analysis & Design Sung-Mo Kang & Yusuf	Lablebici
07.	VHDL: Programming by Example.	Douglas L. Perry.
08.	A VHDL Primer	J. Bhasker
09.	Verilog HDL	Samir Palnitkar

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

BRANCH : ELECTRONICS & COMMUNICATION
COURSE NO : ECE-703(A) ELECTIVE-I
COURSE TITLE : WIRELESS COMMUNICATION
DURATION OF EXAM: 3 HOURS.

			MARK	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

SECTION-A

Introduction to Wireless Communication : Examples of different wireless system, communication system- Cordless Telephone systems, Cellular Telephone system, Introduction to 2G and 3G wireless Network.

The Cellular Concept : Introduction, frequency reuse, Handoff strategies, Co channel interference and system capacity, Adjacent channel capacity, Improving Coverage and capacity- Cell splitting, Sectoring.

Multiple Access Techniques : Introduction, TDMA, FDMA, CDMA, SDMA,

Modulation Technique: BPSK, QPSK, π/4QPSK, MSK, GMSK Transmission & detection.

SECTION-B

Mobile Radio Propagation : Free space propagation model, Small scale Multipath propagation, Parameters of Mobile Multipath channels, Types of small scale fading, Rayleigh Distribution, Ricean Distribution, Diversity techniques -Space Diversity, Frequency Diversity, Rake Receiver, Introduction to SISO & MIMO (Multiple I/P Multiple O/P systems).

Wireless System & Standards : GSM-Features, Architecture, Channel types, CDMA Digital Cellular standard (IS-95) - Forward & Reverse CDMA channels, Introduction to Bluetooth, Wi-Fi, Wi-mac.

BOOKS RECOMMENDED :

01. Wireless Communication : by T.S. Rappaport
02. Personal & Mobile Communication : by R. Panday
03. Mobile Communication Engg. : by W.C.Y. Lee Tata McGraw Hill

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 7TH SEMESTER
BRANCH: ELECTRONICS & COMMUNICATION
COURSE NO: ECE-703(B) ELECTIVE-I
COURSE TITLE: COMPUTER NETWORKS & COMMUNICATION
DURATION OF EXAM: 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	50

SECTION-A

Introduction : Goal of Network, Network classification (LAN, MAN, WAN), Topology signification of layered models, Reference models OSI & TCP/IP and comparison.

Data Communication : Synchronous and asynchronous, Encoding techniques, (NRZ, RZ, Manchester, AMI), Transmission media, Guided and unguided, Switching techniques-circuit switching, Message switching, Packet switching-datagram & virtual circuit, Example physical layer protocol-RS232, Error detection and correction, flow control stop and wait protocol, Sliding window protocol, Example protocol HDLC.

Medium Access Control: Access Techniques FDMA, TDMA, Media Access control-ALOHA, Slotted ALOHA, CSMA, CSMA/CD, LAN protocol IEEE 802.3.

SECTION-B

Routing and Congestion Control : Routing algorithm-Shortest path algorithm, flooding, distance vector routing, Link state routing, Congestion control of virtual circuit subnets, Congestion control in datagram subnets, leaky bucket algorithm,

Internet Protocol : IP addressing, Address resolution protocol (ARP), Reverse ARP, Subnetting & supernetting.

Network Security : Cryptography, Data encryption standard (DES), DES chaining, public key algorithm.

Network Applications : Introduction to Email, FTP, Telenet, WWW, DNS.

TEXT BOOK :

01. Computer Networks by Andrew S. Tanenbaum

REFERENCE :

01. Data Communication & Computer Networks by William D. Stallings
02. Computer Networking by Behrouz A. Forouzn

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS : BE 7TH SEMESTER
BRANCH : COMPUTER ENGINEERING/ECE
COURSE NO : HUM-711
COURSE TITLE : INDUSTRIAL MANAGEMENT
DURATION OF EXAM : 3 HOURS.

	L	T	P	MARKS THEORY	MARKS SESSIONAL
	3	2	0	100	50

SECTION-A

Unit-1 : Entrepreneurship : Definition and types, Difference Between Intrapreneur & Entrepreneur, Qualities of good Entrepreneurs - Role of Entrepreneurs in the economic development of a country, Functions of entrepreneur, Factors affecting entrepreneurship, Entrepreneurship as a career option for technocrats in India, Schemes and policies for entrepreneurship development. Women Entrepreneur: Classification of Women Entrepreneur in India, Problems of Women Entrepreneur, Steps for promoting women entrepreneurship.

Unit-2 : Legal Forms of Industrial Ownership :

a) Sole Proprietorship.
b) Partnership.
c) Joint Stock Company

Unit-3 : Industrial Development in India after Independence : Industrial Policy of the Five-Year Plans, Industrial Policy (1956, 1977, 1991), Need for Economic Reforms and their Assessment, Multi National Corporations (MNCs) - Concept, Merits & Demerits of MNCs

Unit-4 : Industrial Relations :

1) **Workers participation in management** : Meaning, Objectives & Forms
2) **Trade Union** : Objectives, Functions, Present Position, and Weakness
3) **Industrial Conflict** : Sources and managing conflict
4) **Collective Bargaining** : Meaning, Process, Essential conditions for effective bargaining

SECTION-B

Unit-5 : Management: Meaning, definition, Characteristics, Importance & Functions of Management, **Management Theories** – Taylor's Scientific Management Theory & Henry Fayol's Administrative Management Theory. **MBO** – Definition, Features, Process, Advantages & Limitations of MBO**.**

Unit-6 : Departmentation & Delegation of Authority: Meaning, Importance, Basis or pattern of Departmentation, **Delegation of Authority:** Meaning, Characteristics, Importance, Process, Obstacles/ Barriers to effective delegation of authority, **Authority Relationships** - Line Organization, Line & Staff Organization, Functional Organization.

Unit 7: Personnel Management & Decision Making: Meaning, Objectives, Characteristics, Principles & Functions of Personal department**. Decision making**- Meaning, Importance & Steps in Decision Making.

Unit 8: Wage Administration & Job Enrolment: Concept of Wages, Characteristics of good wage, Factors affecting wages, Methods of wage payments. **Job Evaluation** - Objectives, Principles & Methods of job evaluation.

BOOKS RECOMMENDED :

1. George Terry & Stephen G. Franklin – Principles of Management.
2. Harold Koontz & Heinz – Essentials of Management
3. Sherlekar – Principles of Business Management
4. M. Mahajan – Industrial Engineering & Production Management
5. Dr. Neeru Vasisth --Principles of Management
6. Dr. B. P. Singh & Dr. T. N. Chhabra – Business Organisation & Management

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 7TH SEMESTER

BRANCH: ELECTRONICS & COMMUNICATION	**L**	**T**	**P**	**MARKS**
COURSE NO: ECE-704	**0**	**0**	**0**	**50**

COURSE TITLE: INDUSTRIAL TRAINING

Students are required to undertake 4 to 6 weeks Practical Training during the summer vacations in the field of Electronics & Communication in Govt./Semi-Govt./Private sector. Thereafter, each student shall be required to submit a report on the practical training to the concern HOD for evaluation.

Guidelines for evaluation of Practical Training :

The evaluation shall be done by the departmental committee by the end of 7th semester. The committee shall have a convener and atleast two member.

Distribution of Marks as per the University statues :

Total Marks for Evaluation		= 50 marks	
i)	Report	= 20	40%
ii)	Viva-Voce	= 15	30%
iii)	Miscellaneous Marks	= 15	30%

Due weightage will be given to those who have opted Industrial Training outside the State as well as keeping in view the profile of that Industry.

Award of the Marks :

Marks under (i), (ii) & (iii) will be awarded by the departmental committee constituted for the purpose.

EXAMINATION: B.E. 7TH SEMESTER **BRANCH: E&C ENGINEERING** **COURSE CODE: ECE-705** **TITLE: MINOR PROJECT**	**Hours/ Week** **L T P** **0 0 6**	**Marks** **150**

The project will be assigned to the students towards the end of 6th semester and will start working on these projects at the commencement of their 7th semester. The topic of the project will be decided as per the developments taking place in the field of Electrical Engineering.

This may require complete literature survey, design, fabrication, simulation of models and/or some preliminary laboratory experiments etc. The same project can be extended to 8th semester also.

Distribution of Marks as per University statues :

Total Marks for End semester Evaluation	= 150 marks	
Presentation/Demonstration	= 45 marks	30%
Viva-voce	= 45 marks	30%
Actual work done	= 60marks	40%

Award of Marks :

Marks under (1) and (2) will be awarded by the Departmental committee constituted comprises of convener and atleast two members.

Marks under (3) will be awarded by the concerned Project Guide(s)/supervisor(s).

EXAMINATION: B.E. 7TH SEMESTER
BRANCH: E&C ENGINEERING
COURSE CODE: ECE-706
TITLE: SEMINAR

Hours/ Week			Marks
L	T	P	
0	0	4	100

This will involve a detailed study of a topic of interest reproduced in the candidate's own style. For this, a student has to prepare a seminar by doing proper survey of literature, compilation of information so gathered and then presentation of the same followed by question-answer session. The report of which has to be submitted by the student well before the conduct of seminar. The handout submitted by the student will be in accordance with the standards of technical papers.

Guidelines and evaluation of Seminar in 7th semester:

The topic of the Seminar is to be finalized and approved by the departmental committee by the end of 6th Semester. The committee shall have a convener and atleast two members.

Distribution of Marks:

Total Marks for Seminar Evaluation = 100 marks

1. Project Report = 30 marks
2. Presentation = 50 marks
3. Attendance = 20 marks.

Award of Marks :

- Marks Under (1) will be awarded by the Seminar Incharge.
- Marks Under (2) and (3) will be awarded by the Departmental committee constituted for the purpose.

CLASS : BE 7TH SEMESTER
BRANCH : ECE / AEI
COURSE NO : ECE-711
COURSE TITLE : MICROPROCESSOR (8086) & APPLICATIONS LAB
DURATION OF EXAM : 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
0	0	2	0	30

List of Practical :

01. Write a program to calculate the factorial of a number.
02. Write a program for the addition of two numbers.
03. Write program to find average of two numbers.
04. Write a program to find the sum of numbers in the array & store it in Register or Memory.
05. Write a program to find the greatest number from a given array.
06. Write a program find the smallest number from a given array.
07. Write a program for arranging numbers in ascending order.

08. Write a program for arranging numbers in descending order.
09. Write a program to search an element from a given array.
10. Write a program to convert BCD number into its binary equivalent number.
11. Write a program to move a string from one location to another.

CLASS: BE 7TH SEMESTER
BRANCH: ELECTRONICS & COMMUNICATION
COURSE NO: ECE-712
COURSE TITLE:VLSI LAB
DURATION OF EXAM: 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
0	0	2	0	40

List of Experiments :

Write atleast six programs for combinational and sequential circuits using VHDL/Verilog Hardware Description Languages.

CLASS: BE 7TH SEMESTER
BRANCH: ECE
COURSE NO: ECE-713
COURSE TITLE: MATLAB PROGRAMMING
DURATION OF EXAM: 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
0	0	2	0	30

LIST OF EXPERIMENTS :

01. **Write Program :** study of arithmetic, exponential, Logarithmic, Trigonometric, complex number calculation.
02. **Write Program :** To generate equation of straight line, Geometric series, points on circle, multiply, divide and exponential vectors.
03. **Write Program :**To create and print simple plots and execution of functions.
04. **Write Program :** To generate matrices and vectors, array operations, inline functions anonymous functions etc.
05. **Write Program :** To generate functions like execution a function, global variable, structures.
06. **Write Program :** To generate 2D, 3D plots.
07. **Write Program :** Study of various library blocks and their interconnections.
08. **Write Program :** Matlab Application in Digital Signal Processing

UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME
FOR B.E. 8TH SEMESTER ELECTRONICS & COMMUNICATION ENGINEERING
FOR EXAMINATION TO BE HELD FOR BATCH 2014 & ONWARDS

Course No.	Name of the Course	Hours Per Week			Marks			
		L	T	P	Theory	Sessional	Practical	Total
ECE-801	Microcontrollers & their Applications	3	2	-	100	50	---	150
ECE-802	Antenna & Radar Engineering	3	2	-	100	50	---	150
Elective-II ECE-803	(A) Satellite Communication (B) FPGA Based Digital Design Techniques (C) Nanotechnology (D) Digital Image	3	2	-	100	50	---	150
Elective-III ECE-804	(A) Optical Fibre Comm. (B) Neural Networks & Fuzzy Systems (C) Biomedical Electronics	3	2	-	100	50	---	150
ECE-811	Microcontrollers & their Application Lab	--	--	2	--	--	50	50
ECE-805	Major Project	--	--	14	--	--	350	350
Total		**12**	**8**	**16**	**400**	**200**	**400**	**1000**

NOTE : Students have to select one course from Elective-II & Elective-III

CLASS : B.E. 8TH SEMESTER
BRANCH : ECE/AEI
COURSE NO : ECE-801
COURSE TITLE : MICROCONTROLLERS & APPLICATIONS
DURATION OF EXAM : 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	50

SECTION–A

Role of Microcontrollers– 8 bit Microcontroller, architecture of 8031/8051/8751. Comparison of Microprocessors and Microcontroller watch dog tuner, Data types and Directives. Pin description 0f 8051,I/O port functions, time delay generation and calculation. Addressing modes, logic instructions and programs, single bit instructions and programs, counter timer programming, simplex, half duplex, full duplex transmission, synchronous and asynchronous communication.

SECTION–B

Architecture : PIN and Block Diagram , Instruction Set, Addressing Modes of PIC and ARM Processor. System Design based on 8051, PIC, ARM Processor. Peripheral Interfaces: LCD, Seven Segment Display, Sensor: IR, temperature. Relays, analog to digital converter, digital to analog converter interfaces with 8051 and PIC.

BOOKS RECOMMENDED :

01. The 8051 Microcontroller (architecture, Programming and Applications)
By : Kenneth J. Ayala -----Penram International.

02. The 8051 Microcontroller and Embedded Systems-
By : Muhammed Ali Mazidi & Janice Gillispie Mazdi.

03. Design with Microcontroller
By : John B. Peatman (Tata McGraw Hill Publications)

04. ARM system development guide
By : Andrew-n-sloss & Dominic Symes Publisher –Morgan Aausamann.

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS : B.E. 8TH SEMESTER
BRANCH : ELECTRONICS & COMMUNICATION
COURSE NO : ECE-802
COURSE TITLE : ANTENNA & RADAR ENGINEERING
DURATION OF EXAM : 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	50

SECTION-A

ANTENNA PARAMETERS : Basic ideas of properties of antennas, Radiation patterns, directional properties of dipole antennas, Antenna gain, Antenna aperture and its relation to gain, antenna terminal impedance,. Elementary ideas about self and mutual impedance, front to back ratio, antenna beam width and bandwidth, antenna efficiency, antenna beam area, polarization, Antenna temperature and signal to noise ratio, Reciprocity theorem & application.

RADIATION : Retarded potentials, radiation from a short dipole, radiation from thin linear antenna,radiation resistance of dipole(short and thin linear)

ANTENNA ARRAYS :–Various forms of arrays, Arrays of two point sources, linear arrays of n-point sources, pattern multiplication Arrays of equal amplitude and spacing, array factor ,(Broadside and end fire arrays), directivity of endfire and broadside array, Steered phase array

SECTION-B

PRACTICAL ANTENNAS : Types of antennas, (a) VLF and LF antennas (Hertz and Marconi Antennas), medium frequency antenna and Rhombic antennas, Loop antennas, (b) VHF, UHF and SHF antennas: Folded dipole antennas, Yagi-uda antenna, slotted and horn antennas, helical antennas, Turnstile antenna, Log periodic antenna, Antenna with parabolic reflecter. Microstrip antenna.

RADAR : Radar Block diagram and operation, radar frequencies, application of radar, radar equation, Prediction of range, minimum detectable signal, receiver noise, transmitter Power, pulse repetition frequency and range ambiguity, antenna parameters, system losses and Propagation effects.

RADAR SYSTEM : Doppler effect and its application to CW radar, FM CW Radar altimeters, MTI and pulse doppler radar, tracking radar, Advance Radar, Pulse compression, Chip Radar, Synthetic Aperture Radar, Hologram Radar, Text Book :--

1. J. D. Kraus, "Antennas, "McGraw Hill.
2. Antennas Theory and Design, C.A. Balanis, Raw & Harper.
3. Introduction to Radar Systems, by Merill. I Skolnik.
4. Radar Principles, Technology & Applications Byron Edde

REFERENCE BOOK :

1. F.C. Jordan & B.C.Balmann, "Electromagnetic waves & radiating System", P.H.I.
2. Antennas and Radio wave propagation, Collins, R.E., McGraw Hill.
3. Digital Satellite Communications (Second Edition) Tri, T.Ha. 1990.

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS : B.E. 8TH SEMESTER
BRANCH: ELECTRONICS & COMMUNICATION
COURSE NO: ECE-803(A) ELECTIVE-II
COURSE TITLE: SATELLITE COMMUNICATION
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**Theory**	**Sessional**
3	**2**	**0**	**100**	**50**

SECTION-A

Introduction : Evolution and growth of Communication Satellite, Principle of Satellite Communication, Different types of Satellite, Adv. and Disadv. of Satellite Communication, Frequency Allocation and Band spectrum.

Orbital Mechanics : Equation of the orbit, Locating the Satellite in the orbit and with respect to earth, Telemetry, Tracking and command systems, Transponder, Earth station subsystem--LNA, HPA.

SECTION-B

Satellite link Design–Introduction, Basic Transmission theory, System Noise temperature, C/N and G/T ratio, Uplink design, Down link design.

Multiple Access Techniques--Introduction, TDMA–Frame structure, Frame efficiency, Super frame, Burst structure, FDMA – Demand assigned FDMA, SPADE system.

Satellite Applications – VSAT, MSAT, DB S system , GPS system.

Text book :-

01 Digital Satellite Communications (Second Edition) Tri, T. Ha. 1990.

02 Satellite Communications by T. Pratt

03 Satellite Communications by Dennis Roddy

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS : B.E. 8TH SEMESTER
BRANCH: ELECTRONICS & COMMUNICATION
COURSE CODE: ECE-803(B) ELECTIVE-II
TITLE: FPGA BASED DIGITAL DESIGN TECHNIQUES
DURATION OFEXAM: 3 HOURS

Hours/ Week			**Marks Distribution**	
L	**T**	**P**	**Theory**	**Sessional**
3	**2**	**0**	**100**	**50**

SECTION-A

Logic Design Fundamentals : Combinational logic, hazards in combinational networks, Mealy and Moore sequential circuit design, and sequential circuit timing.

VHDL : Introduction, VHDL terms, code structure, data types, operators and attributes, concurrent and sequential code, variables and signals, subprograms and procedures, packages and libraries, pre-defined attributes.

VHDL Description of Combinational and Sequential Circuits : Multiplexers, decoders, encoders, code converters, Flip-flops, registers, counters, clock synchronization

SECTION-B

Design of Programmable Logic Devices, Circuits and Memories : Read-only memories, programmable logic arrays, programmable array logics, Serial adder, binary multiplier, multiplication of signed numbers, binary divider, VHDL models for memories and buses, simplified bus model.

Design with Field Programmable Gate Arrays : Introduction of FPGAs, designing with FPGAs and CPLDs, Testing combinational logic, testing sequential logic, scan testing.

BOOKS RECOMMENDED :

1. Digital Design — M.M.Mano and M.D Ciletti
2. Digital Design–Principles and Practices — J.F. Wakerly
3. VHDL Programming by Example — D.L Perry
4. Digital System Design Using VHDL — C.H Roth
5. Fundamentals of Digital Logic with VHDL Design — S. Brown and Z.Vranesic
6. Circuit design with VHDL — V.A.Pedroni

NOTE : There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

CLASS : B.E. 8TH SEMESTER
BRANCH: ELECTRONICS & COMMUNICATION
COURSE NO: ECE-803(C) ELECTIVE-II
COURSE TITLE: NANOTECHNOLOGY
DURATION OF EXAM: 3 HOURS.

L	T	P	MARKS Theory	MARKS Sessional
3	2	0	100	50

SECTION-A

Introduction

Introduction to nanoscale science and technology, why nanoscience and nanotechnology ? Length energy and time scales, nanostructure types and properties, electronic and optical properties of materials, top down approach to nanolithography. Spatial resolution of optical, deep ultraviolet, X-ray, electron beam and ion beam lithography.

Quantum Mechanics

Band gap engineering, Quantum confinement of electrons in semiconductor nano structures, One dimensional confinement (Quantum wires), Two dimensional confinement (Quantum wells), three dimensional confinement (Quantum dots) and Bottom up approach, Single electron transistors, coulomb blockade effects in ultra small metallic tunnel junctions.

SECTION-B

Molecular Techniques :

Molecular Electronics, Chemical self-assembly, carbon fullerenes and nanotubes, Self assembled mono layers, MWNT (Multiwalled nanotubes) Applications in biological and chemical detection.

Surface analytical instrumentation techniques for nanotechnology :

Atomic scale characterization techniques, scanning probe microscopy, scanning tunneling microscopy and atomic force microscopy.

Application: Introduction to Nanoelectronics, Nanobioteb

TEXT BOOK :

1. Beenaker and Van Houten "Quantum Transport in Semiconductor Nanostructures in Solid state Physics" Ehernreich and Turnbell, Academic press, 1991

REFERENCES

1. David Ferry " Transport in Nano structures" Cambridge University press 2000
2. Y. Imry " Introduction to Mesoscopic Physics, Oxford University press 1997
3. S. Dutta " Electron Transport in Mesoscopic systems" Cambridge University press
4. H. Grabert and M. Devoret "Single charge Tunneling" Plenum press 1992

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS : B.E. 8TH SEMESTER
BRANCH: ELECTRONICS & COMMUNICATION
COURSE NO: ECE-803(D) ELECTIVE-II
COURSE TITLE: DIGITAL IMAGE PROCESSING
DURATION OF EXAM: 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	50

SECTION-A

Digital Image Processing Fundamentals : Fundamental concepts of image processing, Image sensing & acquisition, Image sampling & quantization, since basic relationship between pixels.

Image Enhancement in Spatial and Frequency Domain : Basic gray level transformation, Histogram processing, Basics of spatial filter ,smoothing & sharpening filters.

2-D Fourier Transform & DFT & their properties, Filtering in frequency domain, smoothing & sharpening filters

SECTION-B

Image Restoration & Segmentation : A model of image degradation & restoration process, Linear position invariant degradation ,estimating degradation function, Inverse filtering.

Detection of discontinuities & Edge Linking Thresholding

Image Compression : Coding, interpixel & Psychovisual redundancy, Error free compression-variable length coding, Lossy compression, Lossy prediction coding.

Object Recognition : Pattern & pattern classes optimum statically classifies & neural networks.

BOOKS :

01. Digital Image Processing : Rafaelc Ganzalez & Richard Woods
02. Digital Image Processing Using Matlab : Ganzalez & Woods
03. Fundamentals of Digital Image Processing : A.K. Jain

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS : B.E. 8TH SEMESTER
BRANCH : ELECTRONICS & COMMUNICATION
COURSE NO: ECE-804(A) ELECTIVE- III COURSE
TITLE: OPTICAL FIBRE COMMUNICATION
DURATION OF EXAM: 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
3	2	0	100	50

SECTION-A

Overview of Optical Fiber Communication : Block diagram of Fiber Optical Comm. system, Evolution of fiber optic system, Elements of transmission link, Nature of light, Basic optical laws, Advantages and Disadvantage of optical fiber Communication.

Optical Fiber Structure and Waveguiding: Mode and configuration, Fiber types, Rays and modes, Step-index fiber structure, Wave equation for step index fiber, Modes in step index fiber, Graded index fiber structure, Numerical Aperture of fibers.

Signal Degradation in Optical Fiber: Attenuation, Absorption, Scattering and bending losses, signal degradation in fiber, Group delay, Material dispersion, Waveguide dispersion, Interamodal & intermodal dispersion, Pulse broadening in graded index fiber.

SECTION-B

Fiber Material Fabrication and Connectors : Glass fibers, Halide glass, Chalgenide glass, Plastic fiber, Fiber fabrication, Outside vapor phase oxidation, modified chemical vapor deposition, Plasma activated chemical vapor deposition, Double crucible method, optical fiber connectors, Requirements of good design, Connector types, Single mode fiber connector.

Optical Sources and Detectors : LED—materials used, structure, Power, Modulation and quantum efficiency, Laser diode—material, structure and efficiency, Photodiode-PIN--Principle. Avalanche photodiode, Principle, Detector response time.

Optical Amplifier : Semiconductor amplifier, External pumping and gain-erbium doped amplifiers, Amplification mechanism.

Applications : Optical WDM, TDM networks and their switching, SDH/SONET, Optical ATM.

BOOK SUGGESTED :

01. Optical Fiber Communication principles and practice by J.Senior
02. Optical Fiber Communication by Gerd Keiser

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS : B.E. 8TH SEMESTER
BRANCH : ECE/AEI
COURSE NO : ECE-804(B) ELECTIVE-III
COURSE TITLE : NEURAL NETWORKS & FUZZY SYSTEMS
DURATION OF EXAM : 3 HOURS.

	L	T	P	MARKS Theory	Sessional
	3	2	0	100	50

SECTION-A

Neural Networks Characteristics : History of development in Neural Networks Principles, Artificial Neural Net terminology, Model of a neuron, Topology and types of learning supervised, Unsupervised.

Learning Rules : The perception, Linear reparability, Basic learning laws, Hebb's rule, Delta rule, Widrow & Hoff LMS learning rule, Correlation learning rule, Instars and out star learning rules. Unsupervised learning, Competitive learning, K-Meams clustering algorithm, Kohonen's feature maps.

Different Neural Networks : Basic learning laws in RBF nets, Back propagation algorithm, Feed forward networks, ART networks.

SECTION-B

Application of Neural Nets : Pattern recognition applications of BPN, Associative memories, Vector.

Fuzzy Logic : Basic concepts of Fuzzy Logic, Fuzzy vs Crisp set, Linguistic variables, Membership function, Operation of Fuzzy sets, Fuzzy IF-THEN rules, Variable inference, Techniques, Defuzzication techniques, Basic fuzzy inference algorithm, Applications of fuzzy logic, Fuzzy system design, Implementation of fuzzy system.

RECOMMENDED BOOKS :

01. Artificial Neural Networks — Zurada
02. Artificial Neural Networks — Vegna Narayanan
03. Neural Networks — Simon Haykin

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS : B.E. 8TH SEMESTER
BRANCH: ELECTRONICS & COMMUNICATION
COURSE NO: ECE-804(C) ELECTIVE-III
COURSE TITLE: BIOMEDICAL ELECTRONICS & INSTRUMENTATION
DURATION OF EXAM: 3 HOURS.

	L	T	P	MARKS Theory	Sessional
	3	2	0	100	50

SECTION-A

Introduction to Bio-Medical Instrumentation : Basic Medical Instrumentation system, Sources of Bio Medical signal, Origin of Bio electric potential, ECG.EEG,EMG, Skin contact impedance and its measurement, Electrode for ECG-limb electrodes, Floating electrodes, Pregelled disposable electrodes for EEG & EMG.

Anatomy and Physiology : Anatomy of heart, Cardiovascular system (Physiology), Conduction system of heart, Anatomy of brain, Nervous system (Physiology).

Bio-Medical Recorders : ECG recorder (Basic and Microprocessor Based), EEG recorder (EEG machine & 10-20 electrode system) and EMG recorder, ECG lead configuration & electrode placement, Phonocardiography.

SECTION-B

Medical Imaging Instrumentation : X-rays-Introduction, Generation of X-ray and X-ray machine Ultrasound-Introduction, Basic pulse echo system, A scan- Echo-encephalography, Echo-ophthalmoscope, M-scan-Echo-cardiograph, B-scan-linear, Sector, Compound scan, Biological effects of ultrasounds.

Therapeutic Instrument : Cardiac pacemakers, need for pacemakers, External pacemakers (continuous & on-demand), Voltage, Current, & current limited voltage pacemakers, Implantable pacemakers i.e fixed rate, Demand and its types.

Cardiac defibrillators, their need, de defibrillators, Implantable defibrillators, pacer-cardiovertor defibrillators.

Patient Safety : Electric shock lazard, Leaking currents, Test instruments for checking safety parameters of Biomedical equipments.

BOOKS RECOMMENDED :

1. Handbook of Biomedical Instrumentation by R.S.Khandpur.

2. Biomedical Instruments: Theory and Design by Walter Welko- Witiz and Sid Doutsch

NOTE : There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS : B.E. 8TH SEMESTER
BRANCH: ECE / AEI
COURSE NO: ECE-811
COURSE TITLE : MICROCONTROLLERS & APPLICATIONS LAB
DURATION OF EXAM : 3 HOURS.

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
0	0	2	0	50

Programs to be introduced based on 8051/PIC:

01. Program to display a message “Excell” on the first line & a message “_____” on 2nd line using LCD display.
02. Program to output incrementing date on Do to D7 on output part in a Continuous loop with some delay.
03. Program to switch on & switch off the relays on output port simultaneously with delay in between.
04. Program to display a message “_____” by pressing reset key. Now press any key, the code will be echoed on Computer Screen.
05. Program to display a message “_____” on the seven segment display with a delay.

06. Program to output the date FA, F6, F5, & F9 on four winding in a continuous loop with delay of a stepper motor.

07. Program to scan Eight keys & display its binary code on LED's.

08. Program to output logic '1'- logic 'O' alternatively on Eight LED's with delay between by making the eight LED's flash.

09. Write a program to convert digital voltage 5v and display using D/A converter.

10. Write a program to convert analog voltage of 5v and display using A/D converter.

Programs based on ARM processor :

11. Study of ARM7-32 Bit Processor Architecture and pin dig.

12. Write a program of Flashing LED connected to port 1 of the Micro Controller

13. Interfacing of ARM Processor with Robot System such as DTMF,IR,RF.

14. Interfacing of the SD-MMC card with ARM7 microcontroller.

15. Interfacing of Biometric & RFID module with ARM7 microcontroller

CLASS : B.E. 8TH SEMESTER

BRANCH: ELECTRONICS & COMMUNICATION	**L**	**T**	**P**	**MARKS**
COURSE NO: ECE-805	**0**	**0**	**14**	**350**

COURSE TITLE: MAJOR PROJECT
DURATION OF EXAM: 3 HOURS.

The student will complete their assigned project work initiated in 7th semester under course No. ECE-705 and submit a detailed project report individually to the Head of the department.

Guidelines for evaluation of Project work in 8th semester :

Sub-distribution of marks :

- For External Examiner : 100
- For Internal Examiner : 250

Sub distribution of internal Marks :

- Mark distribution of internal Project work as per the University statues shall be based on:

a.	Viva-Voce	=	75	30%
b.	Presentation	=	75	30%
c.	Report	=	100	40%
	Total	=	250	