

SCHEME OF INSTRUCTION & EXAMINATION

B.E II YEAR (REGULAR)

(ELECTRICAL & ELECTRONICS ENGINEERING)

SEMESTER - I

Sl. No.	Syllabus Ref.No	SUBJECT	Scheme of Instructions		Duration in Hrs	Scheme of Examination		
			Periods per Week	L/T D/P		Maximum Marks	Univ. Exam Sessi- onals	
THEORY								
1.	MAT 201	Mathematics-III	4	-	3	75	25	
2.	EE 201	Electrical Circuits-I	4	-	3	75	25	
3.	EE 202	Electro Magnetic Theory	4	-	3	75	25	
4.	EE 204	Electrical Measurements and Instruments	4	-	3	75	25	
5.	EC 221	Electronic Engineering - I	4	-	3	75	25	
6.	ME 221	Elements of Mechanical Engineering	4	-	3	75	25	
PRACTICALS								
1.	EC 241	Electronic Engineering –I Lab	-	3	3	50	25	
2.	EE 242	Circuits and Measurements Lab	-	3	3	50	25	
TOTAL			24	6	-	550	200	

MAT 201

MATHEMATICS - III

Instruction	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

UNIT- I

Partial differential equations: Formation of partial-differential equation order - Lagrange's solution. Standard types – Charpit's method of solution-partial differential equations of higher order, Monge's method.

UNIT- II

Fourier Series: Expansion of function in Fourier series for a given range sine and cosine expansions-odd and even functions of Fourier series – change of interval.

UNIT- III

Partial differential equations: Solutions of wave equation, heat equation and Lap equation by the method of separation of variables and their use in problems of vibrating string one dimensional unsteady heat flow and two dimensional steady state flow.

UNIT – IV

Laplace transforms: Laplace transform - Inverse Laplace transform - properties Laplace transforms - Laplace transforms of unit step function, impulse function! Periodic functions - convolution theorem - solution of ordinary differential equation with constant coefficients using Laplace Transform.

UNIT – V

Numerical Methods: Solution of simultaneous, linear equations. Gauss elimination method and ill conditional equations and refinement of solutions. Gauss Seidell iterative method. Numerical differentiation and integration. Solution of differential equations, Runge-Kutta Method-Predictor-corrector method.

Suggested Reading:

1. Kreyszig E, *Advanced Engineering Mathematics*, Wiley Eastern Ltd., New Delhi, 1976.
2. R.K. Jain & S.R.K. Iyengar, *Advanced Engineering Mathematics*, Narosa Publications, 2002
3. A.K. Mukhopadhyay, *Mathematical Methods for Engineers and Physicists*, Wheeler Publishing, 2002.
4. Narayanan Pilay & Ramaniah, *Advanced Mathematics for Engineering Students Volume - III*, S.Chand & Co., New Delhi, 1980.

EE 201

ELECTRICAL CIRCUITS – I

Instructions	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

UNIT – I

Network Elements : Active elements, dependent and independent sources, passive elements – RLC and M. Energy stored in inductance and capacitance. D.C. Circuit analysis. Supervision theorem. Thevenin's and Norton's theorem. Star-delta transformation.

UNIT – II

Response of RLC Circuits : Formulation of integro differential equations in RLC networks, duality, Initial conditions. Response of RL, RC, RLC networks subjected to internal energy. Response of networks to impulse, step, ramp, exponential and sinusoidal excitations. Zero-state response to arbitrary inputs – derivation and computations of convolution integral.

UNIT – III

Laplace Transformation Method of analysis of networks – Definition of Laplace transform pair. Evaluation of Laplace Transform of common time functions. Laplace transform theorems relating shifting, differentiation, integration and convolution of time functions. Waveform synthesis. Laplace transform of periodic functions, initial and final value theorems, partial fraction expansion method of obtaining inverse transforms. Application to solution of Networks. Transfer Functions.

UNIT – IV

Steady state response of RLC networks to sinusoidal excitation – Vector representation – Single phase circuits – series and parallel resonance. Q – factor & bandwidth.

UNIT – V

Topological description of networks : Network graphs, Definition, of tree, Chord, cutset – incident matrix and Custer matrix, Formulation of node equations, loop equations, Cutset equations using these matrices for RLC networks.

Suggested Reading :

1. Van Valkenburg – Network Analysis – Prentice Hall of India – 3rd Edn. 1992
2. W. H. Hayt, J. E Kimmerley – Engineering Circuit Analysis – Mc.Graw Hill, 5th Edition

EE 202

ELECTRO MAGNETIC THEORY

Instruction	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

UNIT-I

Columb's law, Electric Field Intensity, Electric field due to different charge distributions. Electric field due to line charge. Sheet charge. Volume charge distribution. Electric Flux Density. Gauss's Law. Divergence theorem. Poisson's and Laplace Equations. Uniqueness Theorem. Solution of Laplace's equation.

UNIT –II

Energy and potential. Potential Gradient, Energy in electrostatic field. Potential field of a Point charge. System of charges. Conductors. Dielectric Capacitance. Conductor properties and Boundary conditions. Capacitance of two wire line Boundary conditions for perfect dielectric materials.

UNIT-III

The Steady magnetic field. Biot-Savart's Law. Ampere's Law. Stoke's Theorem. Magnetic Vector potential. Faraday's law. Magnetic Boundary conditions. Self and Mutual Inductance.

UNIT-IV

Maxwell's equations. Time varying fields. Displacement current. Different forms and interpretation of Maxwell's equations. Helmholtz equation. Uniform plane wave. Wave Motion in free space. Pointing vector power. Wave motion in perfect dielectric, Lossy Dielectric.

UNIT V

Visual and Numerical Electromagnetic. Visual Display of flux lines. Equipotential line. Examples of conformal mapping. Introduction to finite distance and finite element Method. Method of Moments. Numerical solution of Laplace's equation. Evaluation of capacitance of practical shapes and dielectric fillings. Visual display of fields in traveling wave and standing waves.

Suggested Reading:

1. W.H. Hayt-Engineering Electromagnetics -Tata McGraw Hill-Sih Ed., 1994
2. Sadiku -Elements of Electromagnetics -3rd Edition, Oxford Univ.Press
3. H.Narayan Rao -Elements of Engg. Electromagnetic- Prentice Hall of India – 3rd Edn., 1992

EE 204

ELECTRICAL MEASUREMENTS AND INSTRUMENTS

Instruction	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Unit I

Principles of Measurement and Instrumentation: Objectives of measurements, analog versus digital measurements, accuracy, precision and uncertainty, sources of measurement error. Standard cell and standard resistance. Basic characteristics of measuring instruments with a moving element.

Instruments: Ammeter, Voltmeter. Expression for torque of moving coil, moving iron, dynamometer, induction and electrostatic instruments. Extension of range of instruments wattmeter, Torque expression for dynamometer instruments. Reactive power measurement.

Unit II

Energy meters, single phase and poly phase, Driving torque and braking torque equations. Errors and testing compensation, maximum demand indicator, power factor meters, frequency meters, electrical resonance and Weston type of synchroscope.

Unit III

Bridge Methods: Measurement of inductance, capacitance and resistance using Bridge. Maxwell's Anderson, Wein, Heaveside Cambell's Desauty's, Schering's bridges, kelvin's double bridge, price guard wire bridge loss of charge method, Megger, Wagners Earthing device.

Unit IV

Magnetic Measurements: Ballistic galvanometer, calibration by Hibbert's magnetic standard flux meter, Lloyd-fischer square for measuring iron loss. Testing of ring and bar specimens. Determination of B-H curve and hysteresis loop using CRO, determination of leakage factor.

Unit V

Potentiometers and Instrument Transformers: Crompton's DC and AC polar and coordinate types. Applications, Measurement of impedance. Calibration of ammeter, voltmeter and wattmeter. Use of Oscilloscope in frequency, phase and amplitude measurements. Instrument transformers. Ratio and Phase angle errors and their reduction.

Suggested Readings:

Sawhney- Electrical and Electronics Measurements and Instruments- Dhanpat Rai and Sons, Delhi.

Umesh Sinha- Electrical and Electronics Measurements & Instrumentation- Satya Prakashan, New Delhi

EC 221

ELECTRONIC ENGINEERING-I

Instruction	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

UNIT-I

Semiconductor diodes and Rectifiers: Review of semiconductor physics, p-n junction as a rectifier, v-I characteristics, and temperature dependence of V-I characteristics. Breakdown of junctions. Zener and avalanche, single phase half wave, full wave, bridge rectifiers. L, C, pi section filters, Regulation and ripple characteristics.

UNIT-II

Transistors and their biasing: BJT, current components, CE, CB, CC configurations. Characteristics: Transistor as an amplifier: h-parameters: Analysis of CE, CB, CC amplifiers. Operating point, bias stability, bias stabilization circuits, Fixed bias, collector to base bias and Emitter bias.

Unit-III

Field Effect Transistors and their biasing : Principles of V-I characteristics of JFET and MOSFETs. Depletion and enhancement modes, small signal equivalent circuit, FET and CS amplifier.

Biasing of JFET's and MOSFET's source self bias, biasing for zero current drift, biasing against device variations, Biasing the enhancement MOSFET, Characteristics of UJT, SCR Diac & Triac.

UNIT-IV

Low frequency BJT amplifier Circuits:

Cascading amplifiers, Distortion in amplifiers, Frequency response of RC coupled amplifiers. Transformer coupled amplifiers, step response, bandwidth of cascading stages, Effect of emitter(source) bypass capacitor on LF response.

Suggested Reading:

1. Jacob Millman & Christos C. Hakkias - Electronic Devices and circuits— McGrawHill, 1991.
2. Jacob Millman & Christos C. Hakkias - Integrated Electronics - McGrawHill, 1991.
3. Donald L Schilling & Charles Belove - Electronics Circuits, Discrete & Integrated – McGrawHill International Edition, 3rd Edition, 1989.

ME 221

ELEMENTS OF MECHANICAL ENGINEERING

Instructions	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

UNIT – I

Thermodynamics Concepts of system, process and properties. Laws of thermodynamics, concept of entropy and Clausius inequality, steady flow energy equations for an open system. Conditions of reversible and irreversible process. Calculation of change in Internal Energy, Enthalpy, Entropy and work done.

IC Engines : Concept of Air standard cycles, Otto, Diesel and Dual combustion cycle. Working of Four stroke and Two stroke, petrol and diesel engines. Valve timing diagram. Calculation of Indicated power, Brake power, specific fuel consumption, mechanical and thermal efficiencies.

Reciprocating Air Compressors : Single stage and multistage compressors, work done, efficiency of multistage compressors, Effect of clearance volume.

UNIT – II

Heat Transfer : Basic models of heat transfer, Fourier's law of conduction, Newton's Law of cooling and Stefan-Boltzman's law of thermal radiation. One dimensional steady state conduction heat transfer through plane walls and hollow cylinders with and without heat generation. Critical radius of insulation.

Radiation : Absorptivity, Reflectivity and Transmittivity, Concept of a blackbody and emissivity. Kirchoff's Law, Lambert cosine law, Plank and Wein's Laws. Monochromatic and total emissive power.

Heat Exchangers : Classification and application of heat exchangers in industry. Derivation of LMTD in parallel flow and counter flow heat exchangers and problems.

UNIT – III

Refrigeration : Types of Refrigeration systems – Air Refrigeration system, Vapour compression system, Vapour Absorption system, steam jet refrigeration system, thermoelectric refrigeration system. Working of Bell Coleman air refrigeration system and simple vapour compression cycle for vapour compression system. COP and representation of cycle on T-S, P-H diagrams. Types and properties of Refrigerants.

Air Conditioning : Human comfort components of air conditioning equipment. Psychrometric chart, and Psychrometric Process and load calculations.

UNIT – IV

Basic Manufacturing Process : Welding, Brazing and soldering, brief description of processes, parameters and associated principles, applications of Gas welding, Arc welding and importance of fluxes.

Casting : Sand Casting, die casting and principles and applications.

Forming : Basic concepts of forming process : Rolling wire drawing

Machine Processes : Turning, Drilling and Shaping

UNIT – V

Definition of link, pair, kinematics chain, mechanism and machine. Inversions of slider crank, double slider crank chairs. **Gears :** Classification of gears **Spur Gears :** Types of motion, Nomenclature, Law of gear tooth action, involute as a gear tooth profile, interference of involute gears, minimum number of teeth to avoid interference. **Helical and Bevel gears :** Gear tooth actions and contact conditions. **Worm Gears:** Calculation of speed ration **Gear Trains:** Simple compound reverted and epicyclic gear trains. **Belt and Rope drives :** Open and crossed belt drives. Length of belt. Ratio of tensions .

Suggested Readings :

1. Hajra Choudary – Elements of Workshop Technology Vol. I & II – Asian Publishers 1993
2. Thomas Bevan – Theory of Machines – CBS Publishers, 1995.
3. P. L. Ballacy – Thermodynamics – Khanna Publishers
4. S. S. Ratan – Theory of Machines – Tata McGraw-Hill Publications, 1995.

EC 241

ELECTRONIC ENGINEERING-I LAB

Instruction

3 Periods per Week

MANDATORY DISCLOSURE-2006
MUFFAKHAM JAH COLLEGE OF ENGINEERING AND TECHNOLOGY, HYDERABAD

Curricula and Syllabi for the B.E. Programmes as approved by the University

Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

List of Experiments:

1. Comparison of Semiconductor diodes(Ge,Si and Zener)
2. Static Charecterestics of BJT(CE)
3. Static Charecterestics of BJT(CB)
4. Static Charecterestics of FET(CS)
5. Design of half wave and Full wave Rectifier without filters
6. Design of Rectifiers with C,L,LC and pi filters.
7. Static Charecterestics of SCR.
8. Static Charecterestics ofUJT.
9. MEASUREMENT OF Phase,Frequency and Sensitivity with CRO
10. Biasing of BJT and FET.
11. RC coupled amplifier BJT Frequency response.
12. RC coupled amplifier FET Frequency response.
13. Emittreer Follower
14. Source Follower.
15. Cascaded Amplifier

EC 242

CIRCUITS & MEASUREMENT LAB

Instruction	3Periods per Week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

List of Experiments:

PART – A: CIRCUITS

1. Charging discharging characteristics of RC series circuit
2. Locus diagram of RC/RL circuit
3. Frequency response of a RLC series circuit
4. Parameters of two port network
5. Verification of Theorems (a) Thevenin's Theorem (b) Norton Theorem (c) Superposition Theorem (d) Max power transfer theorem
6. Characteristics of Linear/ Non-linear and bi-lateral elements
7. Transient in RLC circuits
8. Application of PSPICE to electrical circuits

PART – B: MEASUREMENTS

1. Measurement of low resistance by Kelvin's double bridge
2. Calibration of Single phase energy meter by Phantom loading
3. Measurement of Inductance by Maxwells and Andersons bridge
4. Measurement of capacitance by DeSauty's bridge
5. Measurement of Iron losses by Lloyd Fischer square
6. Use of DC Potentiometer for measurement of unknown voltage and impedance
7. Calibration of three phase energy meter (Electromagnetic/Static) by direct loading
8. Use of Oscilloscope and plotting BH curve and calculation of Iron loss

Note: At least 5 experiments should be completed from each part.

