SCHEME OF INSTRUCTION & EXAMINATION

B.E II YEAR (REGULAR)

(INSTRUMENTATION ENGINEERING)

SEMESTER - I

Sl. No.	Syllabus Ref.No	SUBJECT	Scheme of Instructions Periods per Week L/T	D/P	Scheme of Examination Dura-tion in Hrs	Maximum Marks Univ. Exam	Sessionals
		THEORY					
1.	MAT 201	Mathematics-III	**4**	**-**	**3**	**75**	**25**
2.	EE 202	Electro Magnetic Theory	**4**	**-**	**3**	**75**	**25**
3.	EE 203	Network Theory	**4**	**-**	**3**	**75**	**25**
4.	EE 204	Electrical Measurements and Instruments	**4**	**-**	**3**	**75**	**25**
5.	ME 222	Elements of Production Engineering	**4**	**-**	**3**	**75**	**25**
6.	EC 221	Electronic Engineering - I	**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**
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		TOTAL	**24**	**6**	**-**	**550**	**200**

MAT 201

MATHEMATICS - III

I

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 ran 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 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 prope11ies 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 ofMaxwe11'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 ofEngg. Electromagnetic- Prentice Hall of India – 3rd Edn., 1992

EE 203

NETWORK THEORY

INSTRUCTION	**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. Superposition theorem. Thevenin's and Norton's theorem. Maximum Power transfer theorem.. Star-delta transformation.

UNIT-II

Response of RLC Circuits: Formulation of integro differential equations in RLC networks, I duality, Initial conditions. Response of RL, RC, RLC networks subjected to internal energy. Response of networks to impulse, step, ramp, exponential and sinusoidal excitations. Transient and steady state response. Response to arbitrary inputs by convolution.

UNIT - III

Steady state response of RLC networks : Average and RMS value of periodic time function. Steady state sinusoidal response of RL, RC, RLC network notation, vector l i representation, series, parallel and series parallel network. Active and reactive power. ' '

UNIT-IV

Resonance: Series parallel resonance, Bandwidth, Q-factor. Coupled circuit -Analysis of circuits with mutual inductance. Three phase circuits. Generation of3 phase voltages, star I delta connections -solution of3 phase balanced circuits. Power measured by two wattmeter method.

UNIT V

Two port parameters: Impedance, Admittance, transmission -Hybrid parameters of two port passive networks. Their interrelationships. Terminated two ports. Inter connection of two ports.

Suggested Reading:

Van Valkenburg-Network Analysis-Prentice Hall of lndia-3rd Edn.1992
H. Hayt, J.E Kimmerley-Engineering Circuit Analysis-McGraw Hill, 5th Edition

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

ME 222

ELEMENTS OF PRODUCTION TECHNIQUES

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

Unit –I

Classification and Comparism, merits and limitations of manufacturing processes. Criteria for selection of process for manufacturing a product, casting-sand casting types, Procedures to make sand moulds, concept of die casting.

Unit – II

Welding : Introduction and classification of welding process, gas welding, Arc welding flux and gas shielding, Consumable and Non Consumable elctrodes, resistance , spot and butt welding. Brazing and soldering. Brief description of process. Parameters and Associated princples.

Unit – III

Conventional Machining: General Principles,(With Schematic Diagram) and working of Machine Tools i.e.Late shaper milling, Drilling, Gear Cutting and Grinding Machines, concept of NC Machines.

Unit – IV

Un Conventional Machining process, need for unconventional machining process, Classification. Principles (with Schematic Diagram)and Application of abrasive Jet Machining, Ultra Sonic Machininig, Electrical Discharge machining.

Unit – V

Basic Concepts and Calssification of Forming Process, principles, equipment used. Application of forging, extrusion,wire drawing, deep drawing, rolling powder metallurgy.

Suggested Reading:

1. Hajra Choudary, Elemtns of Workshop Technology, Vol1, Vol2., Khanna Publishers Ltd. 6th Edition 1993.
2. P.C Pandey, & H. S hart-ModernmachiningProcesses-TatamcGrawHillPub.Co.,Ltd., 3rd Ed.,1980

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 physicss,p-n junction as a rectifier,v-I charecteristics,and temparature dependence of V-I charecteristics.Breakdown of junctions.Zener and avalanche,single phase half wave,full wave,bridge rectifiers.L,C,pi section filters,Regulation and ripple charecteristics.

UNIT-II

Transistors and their biasing: BJT,current components,CE,CB,CC configurations.Charecteristics:Transistor as an amplifiers: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 charecteristics of JFET and MOSFETs.Depletion and enhancement modes,small single equvalent circuit,FET and CS amplifier.
Biasing of JFET's and MOSFET'ssource self bias,biasing for zero current drift,biasing againist device variations,Biasing the enhancement MOSFET,Charecteristics 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,bandwith of cascading stages,Effect of emitter(source)bypass capacitor on LF response.

Suggested Reading:

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

EC 241

ELECTRONIC ENGINEERING-I LAB

Instruction	3 Periods per Week
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. Emittrer 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 Expriments:

PART – A: CIRCUITS

1. Charging discharging characteristics of RC series circuit
2. Locus diagram of RC/RL circuit
3. Frquency response of a RLC series circuit
4. Parameters of two port network
5. Verification of Theorems (a) Thevenins Theorem (b) Norton Theorem (c) Super positon Theorem (d) Max power transfer theorem
6. Charactreistics 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 Llyod Fischer square
6. Use of DC Potentio meter for measurement of unknown voltage and impedance
7. Calibarationof three phase energy meter(Electromagnetic/Static) by direct loading
8. Use of Oscilloscope and plotting BH curve and calculation of Iron loss

Note: Atleast 5 experiments should be completed from each part.

CE 222

SOLID MECHANICS

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

UNIT – I

Simple stresses and strains, types of stresses and strains, Hooke's Law – stress strain curve, curve for ductile materials. Modulus of elasticity, poission ratio. Linear strain, Volumetric starin relations between elastic constants – Compound bars and temperature stresses – changes in lengths.

UNIT – II

Shearforce and Bending Moment – Relation between intensity of load shear force and bending moment – Shear force and bending Moment diagrams for cantilever and simply supported beams with and without overhanging for point loads and uniformly distributed loads.

UNIT – III

Theoryof simple bending – Assumptions – Derivation of basic equation $M/I = F/Y = E/R$
Modulus of section – Moment of resistance – determination of flexural stresses. Direct and Bending Stresses – rectangular, circular and standard structural sections. Distribution of shear stress.

UNIT – IV

Deflections – Cantilever beams and simply – supported beams including overhanging beams using Macaulay Method for point loads, uniformly distributed loads.
Strain Energy: In bars due to gradually applied loads, sudden loads impact loads and shock loads.

UNIT – V

Torsion-Theory of pure torsion-Derivation of basic equation T/J = q/r = G/L. Solid and hollow circular shafts, Strain Energy – Transmission of power – Combined bending and torsion.
Springs – close coiled helical springs subjected to axial loads and couples – strain energy in springs.

Suggested Reading:

1. Ramamruthan - Strength of Materials – S.Dhanpat Rai & Sons – 1993.
2. B.C. Punmia – Strength of Materials & Theory of Structures – Laxmi Publi. 1992.