SCHEME OF INSTRUCTION & EXAMINATION
B.E. II YEAR
INSTRUMENTATION ENGINEERING

SEMESTER - I

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L	D/P		Univ. Exam	Sessionals
		THEORY					
1.	MT 201	Mathematics-III	4	-	3	75	25
2.	CE 222	Enviornmental Studies	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.	EC 221	Electronic Engg. - I	4	-	3	75	25
6.	ME 222	Elements of Production Techniques	4	-	3	75	25
		PRACTICALS					
1.	EE 242	Circuits & Measurements Lab.	-	3	3	50	25
2.	EC 241	Electronic Engg. Lab-I	-	3	3	50	25
		TOTAL	**24**	**6**	-	**550**	**200**

MT 201

MATHEMATICS-III
(Common to all Branches)

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 of first 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 a function in Fourier series for a given range-odd and even functions of Fourier series-change of interval-Applications of Fourier series-square wave forms-saw tooth wave form and modified square saw tooth wave form-half range sine and cosine expansions-complex Fourier series.

UNIT-III
Applications of Partial differential equations : Solution of wave equation, hear equation and Laplace's 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 hear flow.

UNIT-IV
Numerical methods : Solutions of Algebraic and Transcendental equations - Bisection method, Regula-Falsi method and Newton-Raphson's method-Solution of Linear system of equations, Gauss elimination method, Gauss Seidel iterative method, ill conditioned equations and refinement of solutions, Interpolation, Newton's divided difference interpolation-Numerical differentiation, Solution of differential equations by Euler's method, modified Euler's method and Runge-Kutta Method of 4th order.

UNIT-V

Z-Transforms : Introduction, Basic Theory of Z-transforms. Z-transform of some standard sequences, Existence of Z-Transform. Linearity property, Translation Theorem, Scaling property, Initial and Final Value Theorems, Differentiation of Z-Transform, Convolution Theorem, Solution of Difference equations using Z-transforms.

Suggested Reading :

1. R.K. Jain & S.R.K. Iyengar, *Advance Engineering Mathematics,* Narosa Publications - 2008.
2. B.S. Grewal, *Higher Engineering Mathematics,* Khanna Publications, 40th Edition, 2008.
3. N. Bali, M.Goyal, C.Watkins, *Advanced Engineering Mathematics,* 7th Edition, 2009 Laxmi Publications.
4. M.K. Venkatraman, *Engineering Mathematics-III,* Technical Publications, Chennai.
5. H.K. Dass, *Advanced Engineering Mathematics,* S.Chand & Co. Pvt. Ltd., 2010.

CE 222

ENVIRONMENTAL STUDIES

(Common to all Branches)

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

UNI-I

Environmental studies: Definition, scope and importance, need for public awareness. Natural resources: Water resources; use and over utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. Effects of modern agriculture, fertilizer-pesticide problems, water logging salinity. Energy resources, growing energy needs, renewable and non-renewable energy sources. Land Resources, land as a resource, land degradation, soil erosion and desertification.

UNIT-II

Ecosystems: Concepts of an ecosystem, structure and functions of an ecosystem, producers, consumers and decomposers, energy flow in ecosystem, food chains, ecological pyramids, aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT-III

Biodiversity: Genetic species and ecosystem diversity, bio-geographical classification of India. Value of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity.

UNIT-IV

Environmental Pollution: Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution and solid waste management.

Environment Protection Act: Air, water, forest and wild life acts, issues involved in enforcement of environmental legislation.

UNIT-V

Social Aspects and the Environment: Water conservation, watershed management, and environmental ethics. Climate change, global warming,

acid rain, ozone layer depletion. Environmental protection act, population explosion.

Disaster Management: Types of disasters, impact of disasters on environment, infrastructure and development. Basic principles of disaster mitigation, disaster management, and methodology, disaster management cycle, and disaster management in India.

Suggested Reading :

1. A. K. De, *Environmental Chemistry*, New Age Publications, 2002.
2. E. P. Odum, *Fundamentals of Ecology*, W.B. Sunders Co., USA.
3. GL. Karia and R.A. Christian, *Waste Water Treatment, Concepts and Design Approach*, Prentice Hall of India, 2005.
4. Benny Joseph, *Environmental Studies*,TataMcGraw-Hill, 2005
5. V. K. Sharma, *Disaster Management*, National Centre for Disaster Management, IIPE, Delhi, 1999.

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 Magnetic 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:

1. Van Valkenburg, *Network Analysis,* Prentice Hall of India-3rd Edn.1992 H. Hayt,.
2. J.E Kimmerley, *Engineering Circuit Analysis*, McGraw Hill, 5th Edition.
3. A. Sudhakar, Shyam Mohan S Palli, *Network Ananlysis,* Tata McGraw Hill.

EE 204

ELECTRICAL MEASUREMENTS AND INSTRUMENTS
(Common for EEE & IE)

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 doublebridge, 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:

1. A.K.Sawhney, *A Course in Electrical and Electronics Measurements and Instruments*- Dhanpat Rai and Sons,Delhi,2005.
2. Umesh Sinha, *Electrical and Electronics Measurements & Instrumentation,* Satya Prakashan.
3. F.W.Golding and Widdis, *Electrical Measurements and Measuring Instruments,* 5th Edition-2010.

EC 221

ELECTRONIC ENGINEERING - I

(Common for EEE & IE)

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, temperature dependence of v-I characteristics; Breakdown of junctions-Zener and Avalanche. Single half wave, full wave, bridge rectifiers, L,C, pisection filters; Regulation and ripple characteristics.

UNIT-II

Transistors and their biasing : BJT, current components; CE, CB, CC configurations; characteristics; 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 characteristics of JFET and MOSFETs; Depletion and enhancement modes, small signal equivalent circuit, FET and CS amplifier.

Biasing of JFET's and MOSFETs 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 amplifier stages, simplified analysis for three amplifier configurations, Miller's theorem-High input resistance transistor circuits, cascade configuration, Difference amplifier.

UNIT-V

Multistage amplifiers : Classification of amplifiers, Distortion in amplifiers, Frequency response of RC coupled amplifiers, Transformer coupled amplifiers, step response, Bandwidth of cascaded stages. Effect of emitter (source) by pass capacitor on LF response.

Suggested Reading :

1. Jocob Millman & Christos C. Halkias, *Electonic Devices and Circuits,* McGraw Hill,3/e,2010.
2. Jocob Millman & Christos C. Halkias, *Integrated Electronics,* McGraw Hill, 1991.
3. Donald L Schilling & Charles Belove, *Electronics Circuits : Discrete & Integrated,* McGraw Hill International Edition, 3rd Edition, 1989.

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-1

Classification and comparison, merits and limitations of manufacturing processes, Criteria for selection of process for manufacturing a product, Casting-sand casting types, procedures to make sand moulds, cores, concept of die casting

UNIT-II

Welding: Introduction and classification of welding process , gas welding, arc wielding flux and gas welding, consumable and non-consumable electrodes, resistant , spot and butt welding, Brazing and soldering, brief description of process, parameters, and associated principles

UNIT-III

Conventional Machining: General principles, operations (with schematic diagrams) and working of machine tools viz., Lathe, Shaper, Milling, Drilling and drilling machines. Concepts of NC, CNC, DNC and FMS.

UNIT-IV

Unconventional Machining Processes: Need for unconventional machining processes, classification, principles, (with schematic diagram) and application of Abrasive Jet Machining, Ultrasonic Machining, Electrical Discharge Machining, Laser Beam Machining and Electron Beam Machining.

UNIT-V

Metal Forming: Basic concepts and classification of forming processes , principles, equipment used, application of Forging, Extrusion, Wire drawing, Deep drawing, Rolling and Powder metallurgy .

Suggested Reading:

1 P.N Rao. *Manufacturing Technology*, Vol 1and 2, Tata McGraw Hill Publishing, 2010.

2 Hajra Chowdary, *Elements of Workshop Technology*, Volume- 1 and II, Khanna Publishers, 6th Edition, 2004.

3 P.C.Panday and H.S Shart, *Modern Machining Processes*, Tata McGraw Hill Pub, 3rd Edition, 2006.

4 V.K. Jain, *Unconventional Machining*, Allied Publishers, 2006.

EE 242

CIRCUITS & MEASUREMENTS LAB

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	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) Thevenins Theorem (b) Norton Theorem (c) Super Position 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 Maxwell's 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 conducted from each part.

EC 241

ELECTRONIC ENGINEERING LAB - I
(Common to EEE and IE)

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

Experiments on the following :

1. Comparison of semiconductor diodes (Ge, Si and Zener)
2. Static Characteristics of BJT (CE)
3. Static Characteristics of BJT (CB)
4. Static Characteristics of FET (CS)
5. Design of Half wave and Full wave Rectifier without filters
6. Design of rectifiers with C, L, LC & Pi-filters
7. Static characteristics of SCR
8. Static characteristics of UJT
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. Emitter Follower
14. Source Follower
15. Cascaded Amplifiers

Suggested Reading:

1. Paul B. Zbar, Albert P. Malvino, Michael A.Miller, *Basic Electronics, A Text. Lab Manual,*7th Edition, TMH, 1994.
2. S.Poorna Chandra, B.Sasikala, *Electronics Laboratory Primer, A design approach,* Wheeler publishing, 1998.

General Note:

i) There should not be more than 2 students per batch while performing any of the lab experiment.

ii) Mini Project cum design exercise:
   a) The students must design, rig-up, and test the circuits wherever possible and should carry out the experiments individually.
   b) This exercise carries sessional marks of 10 out of 25, while the remaining 15 marks are for the remaining lab exercises.