

SCHEME OF INSTRUCTION & EXAMINATION

B.E II YEAR (REGULAR)

(PRODUCTION 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.	ME 201	Metallurgy and Material Science	4	-	3	75	25
3.	ME 202	Machine Drawing	-	6	3	75	25
4.	CE 221	Mechanics of Materials	4	-	3	75	25
5.	EE 221	Electrical Circuits & Machines	4	-	3	75	25
6.	CM 221	Managerial Economics & Accountancy	4	-	3	75	25
PRACTICALS							
1.	ME 231	Metallurgy Lab	-	3	3	50	25
2.	ME 232	Computer Drafting Lab	-	2	-	-	25
3.	CE 241	Mechanics of Materials Lab	-	3	3	50	25
TOTAL			20	14	-	550	225

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 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-half range sine and cosine expansions –odd and even functions of Fourier series – change of interval.

UNIT-III

Partial differential equations: Solutions of wave equations, heat equations 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 heat flow.

UNIT-IV

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

UNIT –V

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

Suggested Readings:

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

ME 201

METALLURGY AND MATERIAL SCIENCE

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

Sessional

25 Marks

UNIT-I

Imperfection in crystals, Dislocation in crystals, Types of dislocations, Effect of dislocation on strength of metals, cold and hot working, strain Hardening. Recovery Recrystallisation, Grain growth, grain size and its effect on mechanical properties of metals, fracture: Types of fracture in metals, modes of fracture, Griffith theory of brittle fracture, Crack propagation, ductile fracture, Fracture under combined stress.

UNIT-II

Fatigue: S-N curve, Structure of fatigue fracture specimen. Fatigue crack propagation, Effect of metallurgical variables on fatigue of metal, Low cycle fatigue, Cumulative fatigue, Experimental determination of fatigue strength. (RR-Moore Test).

Creep: Creep strength, Creep curve, Low temperature and High temperature creep, Creep Test, Diffusion: Fick's law of diffusion, Application of diffusion theory in Engineering.

UNIT-III

Extractive Metallurgy (General and Elementary treatment only); Methods of production of pig iron, Wrought iron, Cast iron, Steel, Copper and Aluminium. Types of Cast Iron, Plain Carbon Steels and their properties. Alloy Steels: Effects of alloying elements like Nickel, Chromium, Manganese, Silicon and Tungsten.

UNIT-IV

Structure of Alloys: Construction and interpretation of Thermal equilibrium diagram of binary non-ferrous alloys, study of Eutectic, Eutectoid, peritectic, Peritectoid reactions. Iron-Iron Carbide Equilibrium diagram, Construction and interpretation.

UNIT-V

Heat Treatment: Annealing, Normalising, Hardening, Tempering, Construction and interpretation of T.T.T Curve. Austempering and Martempering. Case Hardening: Carburising, Nitriding, Carbo-nitriding, Flame Hardening, Induction Hardening. Brief introduction of Age Hardening.

Suggested Reading:

1. V.Raghavan, Material Science and Engineering, Prentice Hall of India Ltd., 4th Edition,, 1994.
2. S.H.Avner, Introduction to Physical Metallurgy, McGraw Hill Publication Co.Ltd., 2nd Edition , 1974.
3. S.P.Nayak, Engineering Metallurgy and Material Science, Charoter Publishing House, 6th Edition, 1995.

ME 202

MACHINE DRAWING

Instruction

6 Periods per week

Duration of University Examination

3 Hours

University Examination

75 Marks

Sessional

25 Marks

INTRODUCTION

Format of drawing sheet, title block, conventions of drawing lines and dimensions. First and third angle projections, convention for sectional views. Orthographic projections including sectional views of simple machine elements from the given pictorial or orthographic views.

ASSEMBLY DRAWING

Assembly drawings from given details. Ability to supply additional views. The exercises will be drawings of typical machine parts viz., connecting rod, eccentric, cross-head, machine vice, screw jack, non-return valves, safety valves, bearings, tail stock etc. These are only examples and actual exercise or examination may include any part. The test is for the ability of the student to read and interpret drawings. The drawing should include part list in standard format.

ASSIGNMENTS

Practice of sketching work: Free hand sketches of typical machine elements for simple cases for riveted and screwed fastenings, shaft joints and coupling.

Suggested Reading

1. N.D.Bhatt, "Machine Drawing", Charotar Publishing House, Anand, New Delhi, 28th Edition, 1994
2. N.Siddeshwar, "Machine Drawing", Tata Mc Graw Hill Publishing Co. Ltd., 5th Edition, 1994.
3. K.L. Narayana, P.Kannaiah, K.Venkat Reddy, "Machine Drawing", New Age International (P) Ltd., 2nd Edition, 1999.

CE 221

MECHANICS OF MATERIALS

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

UNIT-I

Stresses and Strains: Kinds of stresses and strains. Elasticity and Plasticity. Hook's law, Stress-Strain diagrams. Moduli of elasticity, Poisson's ratio, Relation between E, N and K, Linear and volumetric strain, Bars of uniform strength, Temperature stresses, Compound bars.

UNIT-II

Sher Force and Bending Moment: Relation between intensity of loading, Shear force and Bending moment and its diagrams. Applications to cantilever, simply supported and over hanging beams. Simple theory of bending-Derivation and application of the flexural formula $M/I=f/y=E/R$, Moment of resistance, Modulus of section, Flitched beams.

UNIT-III

Deflections: Slope and deflections by the method of double integration – Cantilever, Simply supported, over hanging beams- Point loads and Uniformly distributed loads. Theory of Torsion.

Derivation of torsion formula, Torsional stresses, angle of twist, power transmission, effect of combined bending and torsion. Close coiled and laminated springs.

UNIT-IV

Shear Stresses in Beams: Derivation of formulae, Distribution of shear in rectangular, I and T sections, and Hollow Sections Compound stresses –Principal stresses and strains. Mohr’s cycle and Ellipse of stress.

UNIT-V

Stresses in Thin and Thick Cylinders with internal or / and external pressure, Hoop and Longitudinal stresses. Derivation and expressions for stresses, Compound cylinders. Direct and bending stresses-Core of section for rectangular , circular, I,T and rhombus sections. Columns and Struts. Euler and Rankine formula for axial load applications. Secant and Perry formulae for eccentrically loaded columns.

Suggested Reading:

1. B.C Punmia, Strength of Materials & Mechanics of Structures, Standard Publ., 9th Edn.,1992
2. S.Ramamrutham, Strength of Materials, Dhanpat Raj & Sons, 10 th Edn.,1993.

EE 221

ELECTRICAL CIRCUITS AND MACHINES

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

UNIT –I

DC Circuits: Ohm’s Law, network elements, Krichoff’s Laws, Analysis of circuits using loop current methods and node voltage method. Power in DC circuits. Serial and Parallel combination of resistance- Thevenin’s and Norton’s Theorem.

AC Circuits: Sinusoidal Sources. Phasor representation of Sinusoidal quantities, average and RMS value , form factor. Analysis of RLC circuits to sinusoidal inputs. ,power factor, active power, reactive power, energy stored in inductance and capacitance , mutual inductance, dot convention, analysis of simple coupled circuits.

UNIT-II

Production of 3-phase voltages: Analysis of 3-phase balanced circuits,3-phase power measurement by two wattmeter method.

Transformers :Principle of transformation of voltages and currents, equivalent circuit. Transformer on no load and load, efficiency and regulation of transformation. OC and SC tests, auto transformers.

UNIT-III

DC Machines: Construction and working principle of a DC machine. Production of emf in a generator, types of excitation, Characteristics of series, shunt and compound motors. Speed control and application of DC motors. Losses and efficiency.

UNIT-IV

Induction motors: Production of rotating magnetic field, construction and principle of induction motors, methods of starting 3-phase IM, speed control. Rotor current frequency, effect of slip on rotor circuits. Slip torque characteristics.

UNIT-V

Single phase motors: Various types of single-phase motors, split phase, Capacitor start and capacitor run, and shaded pole.

3-Phase AC Generators: Construction, production of emf, armature reaction, synchronous impedance, losses and regulation.

Suggested Reading:

1. V.K.Mehta-Principles of Electrical Engineering & Ele. S. Chand & Co., 1995

CM 221

MANAGERIAL ECONOMICS AND ACCOUNTANCY

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

UNIT –I

Introduction to Economics and its evolution-Managerial Economics its scope, importance and relation to other sciences, its usefulness to engineers-Basic concept of Managerial economics

UNIT-II

Demand Analysis –Concept of demand, determinants, Law of demand, its assumptions, Elasticity of demand, price, income and cross elasticity, Demand Forecasting – markets Competitive structures, price-output determination under perfect competition and Monopoly. (Theory questions and small numerical problems can be asked).

UNIT-III

Theory of Production- Firm and Industry- Production function- input – output relations-laws of returns-internal and external economics of scale. Cost Analysis: Cost concepts – fixed and variable costs-explicit and implicit costs – out of pocket costs and imputed costs – Opportunity cost – Cost output relationship – Break-even analysis. (Theory and problems).

UNIT-IV

Capital Management , its significance , determinants and estimation of fixed and working capital requirements, sources of capital – Introduction to capital budgeting , methods of payback and discounted cash flow methods with problems.

(Theory questions are numerical problems on estimating working capital requirements and evaluation of capital budgeting opportunities can be asked).

UNIT-V

Book-keeping, principles and significance of double entry book keeping, Journal, Subsidiary books, Ledger accounts Trial Balance concept and preparation of Final Accounts with simple adjustments—Analysis and interpretation of Financial Statements through Ratios. (Theory questions and numerical problems on preparation of final accounts, cashbook, and petty cash book, bank reconciliation statement, calculation of some ratios).

Suggested Reading:

1. Varshney RL and KL Maheshwari, Managerial Economics, Sultan Chand.
2. JC Pappas and EF Brigham, Managerial Economics.
3. Grawal T.S. Introduction to Accountancy.
4. Maheshwari S.N. Introduction to Accountancy.
5. Panday I, M Financial Management.

ME 231

METALLURGY LAB

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

1. Study of : Metallurgical Microscope
Iron-Iron Carbide diagram
Procedure of Specimen preparation.
2. Metallographic study and analysis of : Steels-Low, Medium and High Carbon, Stainless, Case Carburised and Cutting tools.
Cast – Iron – White, Gray and Spheroidal Gray.
Non-Ferrous Alloys-Brass, Bronze , Al-Si and Babbit
3. Study of Microsturcture and measurement of Hardness before and after the following Processes: Hardening, Hardening and Tempering, Normalising

Note: Experiment

1. To be carried out in two sessions.
2. To be carried out in eight sessions.
3. To be carried out in eight sessions.

ME 232

COMPUTER DRAFTING LAB

Instruction	2 Periods per week
Sessional	25 Marks

Practical using 2-D drafting packages for the following:

- Exposure to graphic primitives like line, point, plane, circle, arc, annotation etc.,
- Development of drawings to mechanical engineering, using commands.
- Usage of windows and layers
- Creation and updation of symbols libraries.

CE 241

MECHANICS OF MATERIALS LAB

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

Cycle I:

1. Direct Tension Test on metal rods
2. Young's modulus of metal specimen
3. Brinnel's Hardness Test
4. Compression Test on Bricks
5. Impact Test

Cycle II:

6. Spring Test
7. Torsion Test
8. Bending Test
9. Continuous Beam Test
10. Fatigue Test

