VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MECHANICAL ENGINEERING

II/IV BE–I & II SEMESTER SCHEME & SYLLABI
With effect from the academic year 2015-16

DEPARTMENT VISION

To nurture and establish global leadership in the field of mechanical engineering and develop competent human resource to serve the society

DEPARTMENT MISSION

To create an environment of research, innovation and knowledge – based society through latest teaching learning best practices in mechanical engineering.

COLLEGE VISION

Striving for a symbiosis of technological excellence and human values

COLLEGE MISSION

To arm the young brains with competitive technology and nurture the holistic development of the individuals for a better tomorrow

With effect from the Academic Year 2015-16

DEPARTMENT OF MECHANICAL ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION FOR B.E. II YEAR- I-SEMESTER

S No.	Syllabus Ref .No.	SUBJECT	Scheme of Instruction		Scheme of Examination			Credits
			Periods per Week		Duration in Hours	Maximum Marks		
			L+T	D/P		Univ. Exam	Sessi–onals	
THEORY								
1	ME2010	Machine Drawing	2	4	3	70	30	4
2	ME2020	Thermodynamics	4	-	3	70	30	3
3	ME2030	Metallurgy & Material Science	4	-	3	70	30	3
4	CE2060	Fluid Dynamics	4	-	3	70	30	3
5	CE2070	Mechanics of Materials	4	-	3	70	30	3
6	MA2010	Mathematics –III	4	-	3	70	30	3
7	HS2040	Finishing School-I	2+1	-	3	70	30	2
PRACTICALS								
1	ME2011	Metallurgy Lab	-	3	3	50	25	2
2	CE2041	Mechanics of Materials Lab	-	3	3	50	25	2
		TOTAL	**24+1**	**10**	**–**	**590**	**260**	**25**
INTERDISCIPLINARY COURSES OFFERED TO OTHER DEPARTMENTS								
THEORY								
1	ME2060	Elements of Mechanical Engineering (For ECE)	4	–	3	70	30	3
2	ME2070	Principles of Mechanical Engineering (For EEE)	4	-	3	70	30	3

With effect from the Academic Year 2015-16

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD-31

SCHEME OF INSTRUCTION & EXAMINATION

2/4 B.E. Bridge Course (for Lateral Entry Students of all branches)

With effect from the academic year 2015-16

I-Semester

S No.	Code	Subject	Scheme of Instruction				Scheme of Examination			
			Periods per week				Duration	Maximum Marks		Credits
			L	T	D	P		SEM Exam	Sessionals	
Theory										
1	MA2040	Mathematics	1	-	-	-	90 min	25	-	-
2	PH2130	Physics of materials	1	-	-	-	90 min	25	-	-
3	CE2080	Engineering Mechanics	2	-	-	-	3 hrs	50	-	-
Practicals										
4	CS 2091	C-Programming Lab	-	-	-	2	3 hrs	50	-	-
			4	**-**	**-**	**2**	**-**	**150**	-	-
II-Semester Practicals										
1	HS2231	ELT-LAB	-	-	-	2	3	50	-	-

No credits are awarded to the bridge courses offered to 2/4 B.E (all branches) lateral entry students taking admissions from the academic year 2015-16 under autonomous status. However pass in each of these courses is mandatory to obtain the degree. Every student shall get 40% marks in each course for a pass in theory subject and 50% marks in laboratory course. Only semester examinations will be conducted at the end of the each semester.

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 I-SEMESTER
MACHINE DRAWING

Instruction : 6 Periods /week	Sem Exam Marks : 70	Subject Reference Code: **ME 2010**
Credits : 4	Sessional Marks: 30	Duration of SemExam:3Hrs

Course Objectives	Course Outcomes
Student Shall: • Drawing Fundamentals. • Orthographic Projections of machine components. • Geometric proportions of Machine elements. • Preparation of Assembly Drawings	**student will be able to:** • Interpret the conventions used in machine drawing and conversion of pictorial views into orthographic views. • Sketch the machine elements with suitable proportions. • Prepare the assembly drawings from the detailed drawings.

I. INTRODUCTION:

Format of drawing sheet, title block and part list, conventions of drawing lines and dimensions, First and third angles projections, scales as per ISO standards, convention for sectional views. Orthographic projections including sectional views of simple machine elements.

II. DRAWING OF VARIOUS VIEWS of:

Fastners: Screw threads, metric and BSW threads, square threads and multi start threads. Nuts, bolts, washers, set screws, lock nuts and foundation bolts.
Rivited Joints: Forms and proportions of rivet-heads, different views of riveted lap and butt joints.
Shaft joints: Cotter joint and knuckle joint.
Keys and shaft couplings: Muff, flanged, flexible, universal and Oldham's coupling.
Shaft bearing: Solid and bush bearing, plummer block, foot step bearing.
Pipe joints: Flanged joint, socket and spigot joint.

III. ASSEMBLY DRAWINGS OF:

Engine parts: Piston, stuffing box, cross head for vertical and horizontal engine, connecting rod, eccentric.

Machine elements: Lathe tail stock, machine vice, single tool post.

Valves: Steam stop valves, safety valves, screw jack.

Learning Resources:

1. N.D. Bhatt, Machine Drawing, Charotar Publishing house, Anand, New Delhi, 28th edition, 1994.
2. N. Siddeshwar, Machine Drawing, Tata McGraw 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.
4. K.C. John, Text book of machine Drawing, PHI Learning, 2010.
5. Ajeet Singh, Machine Drawing includes Autocad, McGraw Hill Education, 2nd Edition, 2014

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 I-SEMESTER
THERMODYNAMICS

Instruction : 4 Periods /week	Sem Exam Marks : 70	Subject Reference Code: **ME 2020**
Credits : 3	Sessional Marks: 30	Duration of SemExam:3Hrs

Course Objectives	Course Outcomes
Student shall: • acquire knowledge of the fundamentals of thermodynamics and temperature scales • apply First law of thermodynamics to various thermal engineering devices • explain second law of thermodynamics and concept of entropy • explain the various properties of steam • apply the knowledge of thermodynamics to air standard cycles, vapour power cycle and analyze the properties of gas mixtures.	**student will be able to:** • Apply the knowledge of thermodynamics to temperature scales. • Solve the practical thermodynamic problems by applying first law and steady flow energy equation • Analyze the problems on heat engines, refrigeration and entropy by applying second law of thermodynamics • Compute problems in steam engineering applications • Evaluate the performance of air standard cycles and vapor power cycle

UNIT– I

Introduction: What is Thermodynamics? Microscopic and Macroscopic approach of thermodynamics system. surroundings and property, intensive and extensive properties, Measurement of temperature, Zeroth law of thermodynamics, Temperature Scales, ideal gas and ideal gas thermometer, quasi static process, Thermodynamics Equilibrium.

UNIT– II

First law of Thermodynamics: Statement of First Law, Heat and work interactions, Thermodynamics work and Internal energy, Energy as property of system, First Law applicable to Closed system, Thermodynamic processes and calculation of work, Heat transfer, and internal energy, Heat as Path Function, First law analysis of flow processes and limitation, Calculation of work done during flow processes.

UNIT– III

Second Law of Thermodynamics: Physical description of second law, Kelvin–Planck and Clausis statement of Second Law of thermodynamics, Equivalence of Kelvin– Planck and Clausius statement, Reversible and irreversible processes, Carnot Theorems, Clausius Inequality, Calculation of entropy change during various thermodynamic processes principle of Entropy increase, T– S diagrams, Concept of exergy and anergy, Helmholtz and Gibb's functions.

UNIT– IV

Thermodynamic properties of Fluids: Properties of pure substances, Concept of phase change, Graphical representation of pressure, Volume and Temperature, (PVT),T and H diagrams, Properties of steam, Use of steam Tables and Mollier diagram, Thermodynamic relations involving entropy, Enthalpy, Internal Energy, Maxwell relations and Clapeyron equation.

UNIT– V

Air standard and Vapour power cycles:

Air standard cycles– Otto, Diesel, Dual Combustion Cycle, Brayton Cycle and Sterling Cycle.

Vapour power cycles- Simple Rankine cycle

Mixture of Gases: Mole fraction and mass fraction, Partial pressure and Dalton's Law, Amagat-leduc Law of partial volumes, Relation between partial pressure, mole fraction and volume fraction; Gas constant, molecular mass and specific heats of the gas mixtures; relation between volumetric and gravimetric analysis.

Learning Resources:

1. P.K.Nag, EngineeringThermodynamics, McGraw Hill Education, 5th Edition, 2014.
2. Y.Cengel & Boles, Thermodynamics an Engineering approach, McGraw Hill, 7th Edition, 2011.
3. E Rathakrishnan, Fundamentals of Engineering Thermodynamics, PHI Second Edition, Feb 2013.
4. Y.V.C.Rao, An Introduction to Thermodynamics, University Press, 2nd Edition, 2010.
5. PL Ballaney, Thermal Engineering, Khanna Publishers, New Delhi, 2010.
6. D.S. Kumar, Engineering Thermodynamics, S K Kataria and Sons, First Edition 2013.

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 I-SEMESTER
METALLURGY AND MATERIAL SCIENCE

Instruction : 4 Periods /week	Sem Exam Marks : 70	Subject Reference Code: **ME 2030**
Credits : 3	Sessional Marks: 30	Duration of SemExam:3Hrs

Course Objectives	Course Outcomes
Objectives of the course are to: • Describe various crystal defects that occur in metals • Identify various types of loading and failures of metals • Construct phase diagrams from the given data for various binary alloys • Identify and Apply different heat treatment processes to metals • Describe the methods of extracting metals	**student will be able to:** • Describe the relationship between crystal defects and mechanical properties • Estimate the behavior of metals under different loading conditions • Explain property changes in metals and alloys using phase diagrams • Assess property changes in metals due to different heat treatment processes • Apply different methods to extract metals

UNIT – I

Defects in crystals, point, line, surface and volume defects. Mechanisms of plastic deformation: slip and twinning, Effect of dislocations on plastic deformation, Critical resolved shear stress, Hall– Petchs equation, cold working and hot working, strain hardening and Bauchinger effect. Recovery, Recrystallisation, Grain growth and its effect on mechanical properties of metals.

Fracture: Type of fracture in metals, Ductile and brittle fracture, Griffith theory of brittle fracture, crack propagation, modes of fracture, ductile-brittle transition.

UNIT – II

Fatigue: Types of fatigue loading, Experimental determination of fatigue strength (RR– Moore Test),S–N Curve, Structure of fatigue fractured specimen, Effect of metallurgical variables on fatigue of metal, Low cycle fatigue, Cumulative fatigue damage, Factors to be considered for the improvement for the fatigue life.

Creep: Creep Test, Creep curve, Creep strength, Creep deformation mechanisms, difference between creep curve and stress-rupture curve.

Diffusion: Fick's laws of diffusion, Application of diffusion theory in Mechanical Engineering.

UNIT – III

Structure of Alloys: Construction and interpretation of Thermal equilibrium diagram of binary nonferrous alloys, Study of Eutectic, Eutectoid, Peritectic, Peritectoid and monotectic reactions. Iron– Iron Carbide Equilibrium diagram, Construction and interpretation.

Plain Carbon Steels: types, properties and applications

Cast Irons: types, properties and applications.

UNIT –IV

Heat Treatment: Purpose of heat treatment, Annealing, Normalising, Hardening, Tempering, Construction and interpretation of T.T.T curve. Austempering and Martempering. Cryogenic treatment, Case Hardening: Carburising, Nitriding, Carbo–nitriding, Flame Hardening, Induction Hardening, brief introduction of Age Hardening.

UNIT – V

Introduction to Extractive Metallurgy: Method of production of pig Iron by blast furnace, Cast Iron by Cupola furnace, Method of production of steel by Bessemer Convertor, L.D. Process, Electric Arc process. Modern steel making process by Electric slag refining, method of production of copper and aluminum.

Alloy Steels: Effects of alloying elements like Nickel, Chromium, Manganese, Silicon and Tungsten and Titanium. Study about Stainless steels, HSS, Maraging steels, Hadfield steel, Brass, Bronze, Invar, Duralumin and Ti Alloy (Ti– 6Al– 4V) – their composition and properties.

Brief introduction to powder metallurgy.

Definition and applications of composite materials.

Learning Resources:

1. V. Raghavan, Material Science and Engineering, Prentice Hall of India Ltd., 4th Edition, 1994.
2. S.H. Avner, Introduction to Physical Metallurgy, Tata McGraw Hill, 2nd Ed,1997.
3. William D. Callister and David G. Rethwisch, Materials Science and Engineering: An Introduction, John Wiley and Sons Ltd, 9th Edition, 2014
4. S.P. Nayak, Engineering Metallurgy and Material Science, Charotar Publishing House, 6th Edition, 1995.
5. E. Dieter, Mechanical Metallurgy, Metric Editions, Tata McGraw Hill, 3rd Ed, 1997
6. William F Smith, Javad Hashemi, Ravi Prakash, Material Science and Engineering, McGraw Hill Education, 5th Ed, 2014

SYLLABUS FOR B.E. 2/4 I-SEMESTER
SYLLABUS FOR
FLUID DYNAMICS
BE 2/4 – FIRST SEMESTER (INTERDISCIPLINARY COURSES)

Instruction : 4 Periods per week	Semester End Exam Marks :70	Subject Reference Code: **CE 2060**
Credits : 3	Sessional Marks :30	Duration of Sem Exam : 3 Hrs

COURSE OBJECTIVES *In this subject the students will*	**COURSE OUTCOMES** *Upon the completion of this course students will be able to*
1. Identify and obtain values of fluid properties and relationship between them. 2. Underline the principles of continuity, momentum, and energy as applied to fluid motions. 3. Compute laminar and turbulent boundary layer, lift and drag, flow separation fundamentals. 4. Understand the compressible flow equations. 5. Review fundamental principles of fluid dynamics for the solution of practical mechanical engineering problems	1. Identify the flow regime in a given engineering system based on consideration of the governing non-dimensional groups 2. Apply the principles of conservation of mass, momentum, and energy to the control volume to use it in Compressible and incompressible flow. 3. Solve flow through pipes using simple solutions of the Hagen-Poiseuille equation, Moody chart and the head-loss equation. 4. Discuss lift and drag and about the possibility of flow separation. 5. Apply the concepts of fluid dynamics to mechanical engineering.

UNIT-I: **Properties of fluids:** Definition of fluid and concept of continuum. Fluid properties; pressure, specific gravity, density, specific weight, specific volume, dynamic and kinematic viscosity. Classification of fluids; ideal and real fluids, vapour pressure.

Fluid Kinematics: General concepts of path lines, stream lines, streak lines and stream tubes. Classification of fluid flow; steady and unsteady, uniform and non-uniform, laminar and turbulent, rotational and irrotational, one-, two- and three- dimensional flows. Definition and properties of stream function and velocity potential function, and use of flow nets.

UNIT-II : **Fluid Dynamics:** Continuity equation in 3-D Cartesian coordinates, energy of a fluid body, potential energy and potential head, pressure energy and pressure head, kinetic energy and kinetic head, energy equation. Derivation of Euler's and Bernoullis' equations, and their applications, venturi meter, orifice meter, pitot tube and hotware anemometer. Impulse momentum equation, forces on a pipe bend. Measurement of pressure, and use of pressure measuring devices such as piezo, differential manometers and transducers.

UNIT-III: Laminar and Turbulent Flow through Pipes: Distinction between laminar and turbulent flows; Reynold's number and its significance. Upper and lower critical values of Reynold's numbers for flow in pipes. Development of laminar and turbulent flow in circular pipes. Hagen-Poiseuille equation; frictional losses in pipes. Darcy's equation. Estimation of Darcy's friction factor. Empirical formulae and Moody's chart.

UNIT-IV: Boundary Layer Theory: development of laminar and turbulent boundary layers on a flat plate, pressure gradient, and phenomenon of separation and control measures. Fluid flow over an aerofoil, flow around a cylinder at rest, rotational flow around a cylinder at rest, lift and drag forces, and coefficients; circulation and Magnus effect. Boundary layer thickness – displacement, energy, momentum, derivation and problems.

UNIT-V: Compressible fluid flow: Concepts of compressible flow, continuity, momentum and energy equation of compressible flow. Velocity of sound in compressible fluids. Mach Number and its significance. Adiabatic flow in perfect gas, stagnation pressure and temperature. Temperature, pressure, density ratios as functions of Mach number.

Learning Resources :

1. Modi P.N. and Seth S.M., *Hydraulics and Fluid Mechanics including Hydraulics Machines*, Standard Book House, Delhi, 2015.
2. Bansal R.K., *Fluid Mechanics and Hydraulic Machines*, Lakshmi Publications, 2010.
3. Ojha C.S.P., Berndtsson R., Chandramouli P.N., *Fluid Mechanics and Machinery*, Oxford University Press, 2012.
4. Rajput R.K., *Fluid Mechanics and Hydraulic Machines,* S. Chand & Co., 2013.
5. Jain K., *Fluid Mechanics*, Khanna Publishers, Delhi, 1998.

With effect from the Academic Year 2015-16

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 I-SEMESTER
MECHANICS OF MATERIALS

Instruction : 4 Periods /week	Sem Exam Marks : 70	Subject Reference Code: **CE 2070**
Credits : 3	Sessional Marks: 30	Duration of SemExam:3Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
students will	***students will be able to:***
• Examine and interpret basic concepts of Strength of materials and analyze statically determinate and indeterminate structures to compute axial stresses, strains and deformations. • Analyze simple beams subjected to various types of loading and plot shear force and bending moment diagrams analytically and graphically and compute bending stresses. • Define and analyze shear stresses in beams and plot shear stress distribution across cross section of beams • Define and analyze problem of columns subjected to direct and bending stresses and predict the effect of eccentricity of loading on stresses by solution of numerical examples • Investigate the behaviour of thin and thick cylinders subjected to internal and external pressure and apply the concepts to the solution of example problems	• Express his understanding of the basic concepts and principles of Strength of materials and solve problems of composite sections for axial stresses and strains and thermal effects and problems of statically determinate and indeterminate structures. • Construct shear force and bending moment diagrams for beams subjected to various types of loading (analytically and graphically) and compute stresses and strains in bending and shear in the cross section of beams subjected to transverse loading. • Compute direct and bending stresses in columns and beams subjected to eccentric loading. • Compute internal forces in space trusses by method of tension coefficients • Compute stresses in thin cylinders and thick cylinders subjected to internal and external pressure.

UNIT-I :

Stresses and Strains: Definitions, types of stresses and strains. Elasticity and plasticity. Hooke's law. Stress-strain diagrams for engineering materials. Modulus of elasticity. Poisson's ratio. Relationship between elastic constants. Linear and volumetric strains. Bars of uniform strength. Temperature stresses. Compound bars.

UNIT-II :

Shear Force and Bending Moment: Bending moment and shear force diagrams for cantilever, simply supported beams and beams with overhangs carrying point and uniformly distributed loads. Relationship between intensity of loading, shear force and bending moment. Simple theory of bending. Moment of resistance. Modulus of section.

UNIT-III :

Shear Stresses in Beams: Distribution of shear stresses in rectangular, I- and T-, standard steel and hollow sections. Compound stresses, principal stresses and strains. Mohr's circle of stress.

UNIT-IV :

Deflections: Slope and deflections by the method of double integration in cantilever, simply supported beams and beams with over hangs subjected to point loads and uniformly distributed loads.

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

UNIT-V :

Cylinders: Stresses in thin and thick cylinders with internal and external pressures. Hoop and longitudinal stresses. Stresses in compound cylinders.

Direct and bending stresses; Core of rectangular, circular, I- and T-sections.

Columns and Struts: Euler and Rankine formulae for axial load applications. Secant and Perry formulae for eccentrically loaded columns.

Learning Resources :

1. S. Ramamrutham R. Narayanan, *Strength of Materials,* 16 ed, Dhanpat Rai Publishing Company, New Delhi, 2011
2. Bansal R.K, A text book of Strength of Materials, Laxmi Publications, New Delhi, 2010
3. Rajput RK, *Strength of Materials,* 4th Edition S. Chand Publications,New Delhi 2006
4. Junnarkar SB, Mechanics of Structures (Volume I & II), Charotar Publishing House, Anand 2002
5. Pytel and F. L. Singer, Strength of Materials, Harper & Row, Fourth Edition, New York, 1998
6. Subramanian R, *Strength of Materials, 2nd Edition,* Oxford University Press, 2010
7. Ferdinand P Beer et. Al., *Mechanics of Materials,* McGraw Hill, 2008

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR 2/4 B.E. I- SEMESTER
MATHEMATICS – III

Instruction : 4 Periods /week	Sem Exam Marks : 70	Subject Reference Code: **MA 2010**
Credits : 3	Sessional Marks: 30	Duration of SemExam:3Hrs

Course Objectives	Course Outcomes
the students shall: • Understand the basics of Fourier series, partial differential equations. Applications of partial differential equations in one dimensional wave, heat and Laplace equations • study the basic numerical methods to find the solution of algebraic, transcendental equations and also the numerical techniques for finding derivatives, solutions of ordinary differential equations and their applications • study the fundamentals of probability, statistics, distributions, testing of hypothesis, curve fitting, correlation, regression, lines of regression and their applications	**students should be able to:** • Understand the basics of Fourier series, partial differential equations. Applications of partial differential equations in one dimensional wave, heat and Laplace equations • understand study the basic numerical methods to find the solution of algebraic, transcendental equations and also the numerical techniques for finding derivatives, solutions of ordinary differential equations and their applications • understand the fundamentals of probability, statistics, distributions, testing of hypothesis, curve fitting, correlation, regression, lines of regression and their applications

UNIT –I

Fourier Series : Introduction to Fourier series – Conditions for a Fourier expansion – Functions having points of discontinuity – Change of Interval - Fourier series expansions of even and odd functions - Fourier Expansion of Half- range Sine and Cosine series.

UNIT –II

Partial Differential Equations and its Applications: Formation of first and second order Partial Differential Equations - Solution of First Order Equations – Linear Equation - Lagrange's Equation, Non-linear first order equations - Charpit's method

Applications of Partial Differential Equations: Method of Separation of Variables - Solution of One **D**imensional Heat Equation - One Dimensional Wave Equation - Laplace's Equation.

UNIT-III

Numerical Methods: Solution of Algebraic and Transcendental equations**-** Bisection method - Regula Falsi method- Newton-Raphson Method - Solution of Linear System of Equations - Gauss- Seidel Iteration Method – Interpolation- Newton's Forward and Backward Interpolation Formulae - Lagrange's Interpolation Formula - Newton's Divided Difference Formula - Numerical Differentiation -Interpolation approach- Numerical Solutions of Ordinary Differential Equations - Taylor's Series Method - Euler's Method - Runge-Kutta Method of 4^{th} order(without proofs).

UNIT-IV

Probability and Statistics: Random variables – Discrete Probability Distribution – Continuous Probability Distribution - Expectation – Variance – Moments -Moment Generating Function- Poisson and Normal Distributions – Testing of Hypothesis - Tests of Significance -t-test -F- test - χ^2 - test for small samples.

UNIT-V

Curve Fitting: Curve fitting by the Method of Least Squares**,** Fitting of Straight line – Parabola - Exponential Curves- Correlation – Karl Pearson's Co-efficient of Correlation - Spearman's Rank Correlation, Regression - Lines of Regression.

Learning Resources:

1. R.K. Jain & S.R.K. lyengar, Advanced Engineering Mathematics, Third Edition, Narosa Publications, 2007.
2. Higher Engineering Mathematics, Dr.B.S.Grewal, 40^{th} Ed, Khanna Publishers.
3. Numerical Methods, Dr.B.S Grewal Khanna Publishers.
4. Fundamentals of Mathematical Statistics, Gupta & Kapoor, Sultan chand & sons, New Delhi.
5. Advanced Engineering Mathematics, Kreyszig E, 8 th Edition, John Wiley & Sons Ltd, 2006.
6. A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.
7. Numerical Analysis by S.S.Sastry –PHI Learning Ltd.

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 II-SEMESTER

FINISHING SCHOOL-I

Instruction:2+1Periods/week	Sem Exam Marks : 70	Subject Reference Code: **HS 2040**
Credits : 2	Sessional Marks: 30	Duration of SemExam:3Hrs

Course Objectives	Course Outcomes
the student shall : • Identify the various features and functions of human language and communication. • Develop the habit of listening effectively so as to analyze the speaker's tone and tenor. • Choose the appropriate words so as to speak and write accurately. • Read various types of texts and sift information correctly. • Write notes and letters for personal and official purposes.	**the student will be able to:** • Listen and analyze context, tone and tenor before responding to others. • Begin, sustain and end conversation. • Respond to people in different situations. • Read with adequate speed and comprehend various texts. • Use words appropriately in different contexts for speaking and writing. • Use markers in written discourse. • Construct grammatically correct sentences to write effectively.

SECTION-I
Soft skills (35 Marks)

UNIT I : ORAL COMMUNICATION: LANGUAGE FUNCTION IN CONTEXT

- Greeting People and responding to greetings
- Making and responding to introductions
- Making and responding to requests
- Making , accepting and refusing invitations
- Taking permissions
- Thanking people and responding to thanks

UNIT II: AURAL COMMUNICATION: LISTENING TO VARIOUS SPEAKERS AND TEXTS

- Listening for meaningful chunks of information
- Listening for gist and specific information

UNIT III: READING: COMMUNICATING WITH A GIVEN TEXT

- For gist
- For details
- To target questions
- For main idea
- For supporting details to the main idea

UNIT IV: WRITING: PERSONAL AND OFFICIAL COMMUNICATION

- Basic structures of texts
- Punctuation
- Letters
- Types of sentences

UNIT V: GRAMMAR

- Relative clauses
- Subject verb
- Prepositions
- Common errors

VOCABULARY

- Collocations
- Phrasal verbs
- Idioms
- Adjectives for descriptions

Section-II
Technical skills (35 Marks)

Introduction to software development life cycle, implementation of simple program using SDLC
Basic C concepts, Data types
Storage classes, conditional statements
Looping statements
Functions, pass by value / reference
Recursion
Arrays, pointers, structures, union, memory allocation

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 I-SEMESTER
METALLURGY LABORATORY

Instruction: 3Periods/week	Sem Exam Marks : 50	Subject Reference Code: **ME 2011**
Credits : 2	Sessional Marks: 25	Duration of SemExam:3Hrs

Course Objectives	Course Outcomes
students shall: • Outline the general procedure followed for preparation of themetallographic samples • Prepare metallographic samples for observation • Identify micro structures of various samples of metals • Conductheat treatment for steel samples • Examinemicro structures using metal analyzer	**students should be able to:** • Describe the relationship between microstructure and properties of various metals • Assess property changes in steels due to different heat treatment processes

List of Experiments:

1. Study of General Procedure for Specimen preparation and Metallurgical Microscope.
2. Preparation of Mounted samples with the help of mounting press
3. Metallographic study and analysis of Low and Medium Carbon Steels
4. Metallographic study and analysis of Eutectoid and High Carbon Steel
5. Metallographic study and analysis of Stainless steel and High Speed Steel
6. Metallographic study and analysis of White and Gray Cast iron
7. Metallographic study and analysis of Malleable and Spheroidal cast iron
8. Metallographic study and analysis of Non– Ferrous Alloys–Copper, Aluminum
9. Metallographic study and analysis of α– Brass, α– β– Brass
10. Metallographic study and analysis of Bronze and Al– Si alloy
11. Study of Microstructure and measurement of Hardness of plain carbon steel before and after the following Processes: Annealing and Normalizing
12. Study of Microstructure and measurement of Hardness of plain carbon steel before and after the following Processes: Hardening, Hardening and Tempering
13. Measurement of hardenability using Jominy End Quench Test
14. Study of Microstructure characteristic by Image Analyzer.

Note: Minimum 12 experiments to be conducted

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 I-SEMESTER
MECHANICS OF MATERIALS LABORATORY

Instruction: 3Periods/week	Sem Exam Marks : 50	Subject Reference Code: **CE 2041**
Credits : 2	Sessional Marks: 25	Duration of SemExam:3Hrs

Course Objectives	Course Outcomes
students shall	***studets will be able to:***
• Determine the properties of materials under the action of various loads. • Learn the ability to work in a team and make effective presentations.	• Determine Young's Modulus of materials of beams by conducting deflection test. • Assess the quality of materials by conducing hardness test and impact test. • Learn the operation of universal testing machine (UTM). • Determining modulus of rigidity of materials by conducting torsion test and spring test. • Practice working as a team member and make effective presentations.

List of Experiments:

1. Determination of Young's modulus by conducting Deflection test on cantilever beam
2. Determination of Young's modulus by conducting Deflection test on simply supported beam
3. Izod Impact test
4. Direct tension test on metal rods
5. Brinnel's and Rockwell's hardness tests
6. Compression test on brittle and ductile materials
7. Determination of modulus of rigidity by conducting tension test on a helical spring
8. Determination of modulus of rigidity by conducting compression test on a helical spring
9. Determination of modulus of rigidity by conducting torsion test
10. Determination of modulus of rigidity by conducting diflection test on fixed beam
11. Determination of modulus of rigidity by conducting diflection test on continues beam
12. Bend test on metal rod

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 I-SEMESTER
ELEMENTS OF MECHANICAL ENGINEERING (for ECE)

Instruction: 4 Periods/week	Sem Exam Marks : 70	Subject Reference Code: **ME 2060**
Credits : 3	Sessional Marks: 30	Duration of SemExam:3Hrs

Course Objectives	Course Outcomes
The course will enable the students to: • Learn the basic principles of Mechanical Engineering in the areas of Thermodynamics, Heat transfer, Refrigeration, IC Engines, Compressors, Manufacturing and Kinematics of Machines	At the end of the course students should be able to: • Understand the Thermodynamic laws and their applications. • Understand the modes of heat transfer and different type's heat exchangers. • Understand the principles of refrigeration. • Understand the basic manufacturing processes. • understand the principles of kinematic links

UNIT– I

Thermodynamics: Concept of system, process and properties, laws of thermodynamics, concept of entropy and Clausius inequality, steady flow energy equation for an open system.

IC Engines: Working of Four Stroke and Two Stroke Petrol and Diesel Engine with p– V diagrams, Valve timing diagram, Calculation of Indicated power, Brake power, Specific Fuel Consumption, Mechanical and Thermal efficiencies.

Reciprocating Air Compressors: Work done, efficiency of multistage compressors, Effect of clearance volume.

UNIT– II

Heat Transfer: Basic modes of heat transfer, Fourier's law of conduction, Newton's Law of cooling, Stefan– Boltzman Law of radiation and one dimensional steady state conduction heat transfer through plane walls without heat generation.

Heat Exchangers: classification and applications of heat exchangers in industry, derivation of LMTD in parallel and counter– flow heat exchangers and problems.

UNIT– III

Refrigeration: Types of Refrigeration systems–Air Refrigeration system, vapor compression system, ammonia– water absorption refrigeration system, thermoelectric refrigeration system, COP and representation of cycle on T-S and H-S diagrams, Types and properties of refrigerants, eco– friendly refrigerants, Introduction to Psychometry and Psychometry processes.

UNIT– IV

Basic Manufacturing Processes: Welding, Brazing, Soldering, brief description of process and parameters, associated principles of gas welding, arc welding.
Casting: Sand casting, Die casting and principles and applications.
Forming: Basic concepts of forming processes: Extrusion, rod/wire drawing, Forging and Rolling.
Principles and Applications of basic Machine Processes: Turning, Drilling and Shaping.
Introduction to Additive Manufacturing.

UNIT– V

Definition of kinematic link and pair, mechanism and machine. **Gears:** Classification of gears, nomenclature, **Gear Trains:** Simple, compound, inverted and epi– cycle gear trains.
Belt and Rope drives: Open and crossed belt drives, Length of belt, Ratio of tensions of flat belt, condition for maximum power transmission for flat belt.

Learning Resources:

1. RK Rajput, Thermal Engineering, Laxmi Publications, 2005
2. C. Sachdeva, Fundamentals of Engineering heat and mass transfer, Wiley Eastern Ltd., 2004.
3. PN Rao, Manufacturing Technology, Vol. 1 & 2, Tata McGraw hill Publishing Co., 2010.
4. Thomas Bevan, Theory of Machines, CBS Publishers, 1995.
5. V K Manglik, Elements of Mechanical Engineering, PHI Learning Pvt Ltd, 2013
6. Chua CK, Leong K.F, Rapid Prototyping Principles – Principles and applications in Manufacturing, Cambridge University Press India Private Limited, 3rd Edition, 2000

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 I-SEMESTER

PRINCIPLES OF MECHANICAL ENGINEERING (For EEE)

Instruction: 4 Periods/week	Sem Exam Marks : 70	Subject Reference Code: **ME 2070**
Credits : 3	Sessional Marks: 30	Duration of SemExam:3Hrs

Course Objectives	Course Outcomes
The course will enable the students to: • learn the basic principles of mechanical engineering in the areas of Heat transfer, Refrigeration; IC Engines; Gears, Ropes and Belt drives; Hydraulic turbines and pumps	At the end of the course students should be able to: • compute the problems in heat transfer and refrigeration • evaluate the performance of on I.C. Engines, air compressors and analyze the working of Boilers and gas turbines • Compute the power transmission, velocity ratio in belt &rope drives and gear trains. • calculate coefficient of discharge in flow meters and evaluate the performance of hydraulic turbines • analyze the problems in centrifugal pumps and reciprocating pumps

UNIT-I

Heat Transfer: Modes of Heat transfer – conduction, convection and radiation – steady state conduction – Heat transfer through plane walls, cylinders, critical radius of insulation for cylinders, concept of black body radiation.

Heat Exchanger: Classification, Industry applications, LMTD calculations for parallel and counter flows.

Refrigeration System: Coefficient of performance, ton of refrigeration, air refrigeration system using Bell Colemn Cycle, simple vapour compression refrigeration system (dry saturated at the beginning of the compression) T-S and P-H diagrams, refrigerants and their properties, working principle of window and split air conditioning systems.

UNIT-II

IC Engines: Working of four–stroke and two–stroke petrol and diesel engines with P–v diagrams, calculation
of indicated power, brake power, specific fuel consumption, mechanical and thermal efficiencies.

Reciprocating air compressors: Uses of compressed air, principle of working and work done of single stage compressor–With out and with clearance, multistage compressors, advantages, intercoolers and after cooler.
Generation of Steam: Classification of boilers, Fire tube boilers–Locomotive boilers, Cochran boiler, Water tube boiler–Babcock & Wilcox boiler.
Gas Turbines: Classification, calculation of efficiency of simple open gas turbine cycle (Joule cycle/Brayton cycle) and applications

UNIT-III
Gears: Classification, Gear trains, types – Single, compound, Inverted & Epi cyclic gear trains, Belt & rope drives, open and cross belt, length of belt, ratio of tension flat belts, condition for maximum power.

UNIT-IV
Introduction to Bernoulli's equation, applications – Venturi meter, Orifice meter, Flow through pipes – Hagen's formula, Friction loss in pipes, Darcy's formula, Reynolds number and its significance.
Hydraulic Turbines: Classification – working principle – Francis, Kaplan, Pelton Wheels, work done, power output, efficiency, specific speed, unit quantities, draft tube, performance characteristic curves.

UNIT-V
Pumps: Working principles and construction details of centrifugal and reciprocating pumps, Effect of friction, acceleration head, work done, power required with and without air vessels, cavitation, and velocity triangles of centrifugal pumps.

Learning Resources:
1. PL Ballaney, Thermal Engineering, Khanna Publishers, New Delhi 2010.
2. VB Bandari, Machine Design, Tata McGraw Hill, 2010
3. R.K. Rajput, Thermal Engineering, Laxmi Publications, 2005
4. S. Ramamrutham, Hydraulic, Fluid Mechanics and Fluid Machines, Dhanpat Rai and sons, 2006

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

DEPARTMENT OF MECHANICAL ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION FOR B.E. II YEAR-II-SEMESTER

S No.	Syllabus Ref .No.	SUBJECT	Scheme of Instruction		Scheme of Examination			Credits
			Periods per Week		Duration in Hours	Maximum Marks		
			L+T	D/P		Univ. Exam	Sessi–onals	
THEORY								
1	ME2040	Kinematics of Machines	4	1	3	70	30	3
2	ME2050	Applied Thermodynamics	4	-	3	70	30	3
3	EC2280	Applied Electronics	4	-	3	70	30	3
4	EE2090	Electrical Circuits & Machines	4	-	3	70	30	3
5	MA2030	Mathematics-IV	4	-	3	70	30	3
6	HS2250	Finishing School-II	2+1	-	3	70	30	2
7	HS2140	Human Values and Professional Ethics	2	-	3	70	30	1
PRACTICALS								
1	ME2021	Applied Thermodynamics Lab	-	3	3	50	25	2
2	EE2111	Electrical Circuits & Machines Lab	-	3	3	50	25	2
3	EC2491	Applied Electronics Lab	-	3	3	50	25	2
		TOTAL	**24+1**	**10**	**640**		**285**	**24**
INTERDISCIPLINARY COURSE OFFERED TO OTHER DEPARTMENTS								
1	ME2080	Mechanical Technology (For CE)	2	-	1½	35	15	2
2	ME2031	Mechanical Technology Lab (For EEE)	-	3	3	50	25	2

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 II-SEMESTER

KINEMATICS OF MACHINES

Instruction :5Periods/ week	Sem Exam Marks : 70	Subject Reference Code: **ME 2040**
Credits : 3	Sessional Marks : 30	Duration of Sem Exam:3 Hrs

Course Objectives	Course Outcomes
The course will enable the students to: • Learn the graphical and analytical methods to perform kinematic analysis of planar mechanisms and to analyze the motion transmission between elements using lower and higher pairs.	At the end of the course students shall be able to: • perform kinematic analysis of planar mechanisms • Design the cam profile for given required motion of the follower. • Select the suitable motion transmission i.e, belt, chain, or gear drive type and analyze their kinematic characteristics.

UNIT– I

Definitions: Kinematic link, pair, chain, mechanism and machine. Classification of links, pairs. Degrees of freedom of mechanisms, coupler curves and their properties.
Inversions: Quadric cycle chain, single and double slider crank chains.
Straight line motion mechanisms: Pantograph, Peaucellier, Hart.
Steering gear mechanisms: Davis and Ackerman.

UNIT– II

Analysis of Mechanisms: Velocity analysis: Graphical Relative velocity and Instantaneous center methods.
Acceleration analysis: Graphical method for different mechanisms including coriolis component of acceleration
Kinematic analysis of four bar and slider crank mechanisms using analytical method
Synthesis: Four bar mechanism using Freudenstein's method.

UNIT– III

Cams: Types of Cams and followers, Nomenclature of cam. Displacement diagrams for followers: uniform velocity, parabolic, simple Harmonic and cycloidal motions. Layout of cam profiles for translating motion - knife edge, flat and roller followers and for oscillating motion - roller follower. Introduction to special cams

UNIT– IV

Belt drives: Flat, V-belt and Rope: Open and cross belt drives, Length of belt, Ratio of tensions, Effect of Centrifugal tension and initial tension over power transmission, Conditions for maximum power.

Chain drives: classification, length, velocity ratio, power transmission.

UNIT– V

Gears: Classification of gears. **Spur Gears:** Nomenclature, Law of gear tooth action. **Form of teeth:** cycloidal and involute profiles. Expressions for velocity of sliding between teeth, arc of contact and contact ratio. Interference of involute gears, minimum number of teeth to avoid interference. Introduction to helical, bevel and worm gears.

Gear trains: Simple, Compound, Reverted and epi-cyclic Gear Trains.

Learning Resources:

1. Thomas Bevan, Theory of Machines, CBS Publishers, 2005.
2. Kinematics and Dynamics of machinery, Tata McGraw Hill, R.L.Norton
3. J.E.Shigley, Theory of Machines, Oxford univerdity press, 4th edition, 2015.
4. S.S. Ratan, Theory of Machines, Tata McGraw Hill, 2014.
5. www.journals.elsevier.com/mechanism-and-machine-theory

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 II-SEMESTER
APPLIED THERMODYNAMICS

Instruction :4Periods/ week	Sem Exam Marks : 70	Subject Reference Code: **ME 2050**
Credits : 3	Sessional Marks : 30	Duration of Sem Exam:3 Hrs

Course Objectives	Course Outcomes
The objectives of this course are to: • describe the types and working principle of reciprocating air compressors • explain the construction and working of internal combustion engines and discuss the combustion phenomenon in petrol and diesel engines • classify and explain the working principles of steam boilers and condensors • Analyze vapour power cycles and steam nozzles.	On completion of the course the student will be able to: • Analyze the performance of air compressors and solve numericals related to the performance of single stage and multi stage air compressors • Describe the various cooling, lubrication, ignition & fuel supply systems and evaluate the performance parameters of internal combustion engines • Discuss various stages of combustion phenomena in I.C. Engines • Explain the working principles of different boilers and condensers • Analyze the performance of vapour power cycles cycle and steam nozzles

UNIT – I

Reciprocating Air Compressors: Uses of compressed air, Classification of compressors-single stage and multistage compressors, Derivation of work done with and without clearance volume, Work done of multistage compressors-effect of clearance volume on workdone -Inter-cooling and After-cooling

UNIT-II

Internal Combustion Engines : Classification, working principle, Deviation of actual cycles from air standard cycles, Index of compression and expansion for variable specific heats, Battery and Magneto ignition systems, Multipoint fuel injection system, Lubrication systems, Cooling systems, Carburetors-Simple and Zenith carburetors-Valve and Port-timing
diagrams. Performance of I.C. engines-Determination of Indicated power, brake power, frictional power, brake thermal efficiency, mechanical

efficiency, indicated thermal efficiency, relative efficiency, and volumetric efficiency, specific fuel consumption based on brake power and indicated power, Heat balance sheet.

UNIT-III

Combustion in I.C. Engines: Combustion phenomena in spark ignition engines and compression ignition engines-Premixed and diffusion flames, Mechanics of propagation, Self ignition process, Limits of self ignition. Fuel requirements and fuel rating- Anti-knock additives like TEL etc., merits and demerits. Effect of engine variables- Stages of combustion - Delay period, Period of uncontrolled combustion, Period of controlled combustion, Afterburning. Types of combustion chambers in spark ignition and compression ignition engines-Air pollution from 1C engines- Effects and control of exhaust from engines.

UNIT – IV

Steam Boilers: Classification of boilers-Fire tube boilers- Cochran boiler, Locomotive boiler, Water tube boilers-Babcock and Wilcox boiler, super critical boilers-Benson, Fluidized bed combustion boilers, Boiler mountings and accessories. Boiler performance and boiler draught-Chimney design, Types of condensers Jet and Surface condensers, introduction to cooling towers.

UNIT-V

Steam power plant: Working Carnot and Rankine cycles, cycle analysis, Modified Rankin cycle, Cycle efficiency improvement methods, Reheating, Regeneration and Cogeneration.

Steam nozzles: Types of nozzles, Nozzle efficiency, Velocity of steam flowing through the nozzle. Mass of steam discharged from the nozzle, Condition for maximum discharge, Critical pressure ratio. Diameters of nozzle throat and exit for maximum discharge

Learning Resources:

1. Heywood. J.B, *"Internal Combustion Engine Fundamentals* ", Tata McGraw Education Pvt. Ltd., New Delhi 2011.
2. Ganeshan.V, "*Internal Combustion Engines*", Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2010.
3. Ballaney. P.L, *"Thermal Engineering",* Khanna Publishers, New Delhi, 2010.
4. Rajput. R. K, *"Thermal Engineering"* Laxmi Publishers, New Delhi, 2004.
5. Mahesh M Rathor, *"Thermal Engineering"* Tata McGraw Education Pvt. Ltd., New Delhi 2010.

With effect from the Academic Year 2015-16

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

SYLLABUS FOR B.E. 2/4 II-SEMESTER

APPLIED ELECTRONICS

(for Mechanical Engineering)

Instruction :4Periods/ week	Sem Exam Marks : 70	Subject Reference Code: **EC 2280**
Credits : 3	Sessional Marks : 30	Duration of Sem Exam:3 Hrs

Course Objective	Course Outcomes
course enables the students: • to acquire the knowledge of various electronic devices & their applications.	After the completion of course, students will able to: • Employ different electronic devices to build electronic circuits such as rectifiers, amplifiers, regulators & oscillators. • Implement digital circuits such as adder & sub- tractors using logic gates. • Convert real time signals into corresponding electrical signals using transducers. • Program 8051 Microcontroller for real-time interfacing applications.

UNIT - I

Semiconductor theory: Energy levels, Intrinsic and extrinsic semiconductors, Mobility, diffusion and drift current, Hall effect.

Diodes - PN junction diodes,. V-I characteristics, dynamic & static resistance, principle of working and V-I characteristics of Zener diode, Working of simple zener voltage regulator, V-I characteristics and applications of SCR and TRIAC. Working and characteristics of UJT.

UNIT - II

Rectifiers & power supplies - block diagram description of a dc power supply, circuit diagram & working of half-wave & full wave rectifier, final equations of Vrms, Vdc, ripple factor and peak inverse voltage in each case. Principle of working of series inductor and shunt capacitor filters. Photoelectric devices-principle of operations of Photodiode, Phototransistor, Photovoltaic cell, Solar cell & LED.

UNIT - III

Bipolar junction transistors: NPN & PNP transistors, structure, typical doping, working of NPN & PNP transistors. Concepts of common base, common emitter & common collector configurations. Comparison of three configurations with reference to voltage & current gains, input & output resistances and applications.

Amplifiers & Oscillators: Circuit diagram & working of common emitter amplifier, function of each component in the circuit, need of proper biasing, frequency response, voltage gain and 3dB bandwidth. Concepts of feedback, working principles of oscillators, circuit diagram & working of RC, LC and Crystal oscillators.

UNIT - IV

Integrated circuits: Advantages of ICs, Analog and Digital ICs. Functional block diagram of operational amplifier, ideal operational amplifier, Inverting amplifier, Non inverting amplifier, Summing Amplifier, Differentiator, Integrator and Comparator.

Digital ICs: Boolean algebra, Logic gates, realization of logic functions. Principle of combinational and sequential logic circuits, Flip-flops.

UNIT - V

Transducers - Resistive and Capacitive transducers, Strain Guage, Thermistor, LVDT.

Micro controllers - Intel 8051 - Architecture, Memory organization, Register banks, Special function registers, Addressing modes. Instruction set of 8051 - Programming examples (addition, subtraction, 8 bit multiplication and 8 bit division, only), Interfacing of 8051 with DC and Stepper motor.

Learning Resources:

1. Jocob Millman, Christos C. Halkias and Satyabrata Jit, Electronics Devices and Circuits, Mc Graw Hill, 3/e., 2010.
2. S.Shalivahnan, N. Suresh Kumar, A Vallavea Raj, Electronics Devices and Circuits TMH, 2003.
3. Rama Kanth A. Gaykward, Op-AMPS and Linear Integrated Circuits -, EEE, 3/e., 1998.
4. Moris Mano, Digital Design, PHI, 3/e., 2009.
5. Mazidi M.A, Mazidi J.G & Rolin D. Mckinlay, "The 8051 Microcontroller & Embedded Systems using Assembly and C," 2/e, Pearson Education, 2007.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E. 2/4 II-SEMESTER

ELECTRICAL CIRCUITS AND MACHINES
(for Mechanical Engineering)

Instruction :4Periods/ week	Sem Exam Marks : 70	Subject Reference Code: **EE 2090**
Credits : 3	Sessional Marks : 30	Duration of Sem Exam:3 Hrs

Course Objective	Course Outcomes
• To impart fundamental concepts of DC and AC circuits, three phase circuits, transformers, DC machines, three phase induction motors and special motors to enable the students to understand and choose the motors in engineering applications.	• Apply the fundamental concepts to solve the problems in DC and AC circuits. • Distinguish three phase connections, calculate power and analyze the behaviour of transformer. • Demonstrate the principle of operation and performance characteristics of DC Machines. • Select suitable three phase induction motor and also interpret speed control method for different applications. • Identify suitable single phase induction motor , Stepper motor and BLDC motor for various applications.

UNIT - I

DC & AC Circuits: Analysis of circuits using loop current method, Thevenin's and Norton's theorems, Sinusoidal sources, Phasor representation of sinusoidal quantities, Average and RMS values, 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 circuits of transformer on no load and load, Efficiency and regulation of transformer, OC and SC tests, Auto-transformer.

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 operation of induction motors, Speed-torque characteristics, Methods of starting and Speed control of 3-phase induction motors.

UNIT - V

Single-Phase & Special Motors: Various types of single phase motors, Split phase, Capacitor start and capacitor run, Basic features of Stepper motor and Brushless DC motor.

Applications of variable frequency (speed) drives.

Suggested Reading:

1. V.K. Metha, Principles of Electrical Engineering, S.Chand & Co., 1995
2. Kothari and Nagrath, Basic Electrical Engineering, Tata McGraw Hill, 2nd Edition, 2002

DEPARTMENT OF MATHEMATICS
Syllabus for 2/4 B.E. II- semester
Mathematics - IV

Instruction :4Periods/ week	Sem Exam Marks : 70	Subject Reference Code: **MA 2030**
Credits : 3	Sessional Marks : 30	Duration of Sem Exam:3 Hrs

Course Objectives	Course Outcomes
• To study the Laplace transforms and Z-transforms to solve differential and difference equations. • To understand the concepts of fourier transforms and its applications • To understand the basics of differentiation and integration of complex functions using Cauchy-Riemann equations, Cauchy's theorem and Cauchy's integral formula to find the complex integration, real integrals using Cauchy's Residue theorem around contours also to study biliear transformations, conformal mapping	The student is able to • understand the laplace transforms and Z-transforms to solve differential and difference equations understand the concepts of fourier transforms and its applications • understand the basics of differentiation and integration of complex functions using Cauchy-Riemann equations, Cauchy's theorem and Cauchy's integral formula to find the complex integration, to find the real integrals using Cauchy's Residue theorem around contours also to study biliear transformations, conformal mapping

UNIT- I (12 classes)

Laplace Transforms: Introduction to Laplace transforms - Inverse Laplace transform - Sufficient Condition for Existence of Laplace Transform –Properties of Laplace Transform- Laplace Transform of Derivatives - Laplace Transform of Integrals - Multiplication by t^n - Division by t – Evaluation of Integrals by Laplace Transforms- Convolution Theorem - Application of Laplace transforms to Linear Differential Equations with Constant Coefficients.

UNIT –II (8 classes)

Z-Transforms: Introduction - Z-transforms of Standard sequences - Linearity Property – Damping Rule - Shifting Properties- Multiplication by n - Initial and Final value theorems – Inverse Z-Transforms- Convolution Theorem – Application of Z-Transforms to Difference Equations.

UNIT-III: (8 classes)

Fourier Transforms: Fourier Integral Theorem - Fourier Transforms – Inverse Fourier Transform - Properties of Fourier Transform –Fourier Cosine & Sine Transforms - Convolution Theorem.

UNIT-IV (15 classes)

Functions of Complex Variables: Limits and Continuity of function - Differentiability and Analyticity - Necessary & Sufficient Condition for a Function to be Analytic - Milne-Thomson's method - Cauchy-Riemann Equations in Polar Form - Harmonic Functions - Complex Integration - Cauchy's Theorem - Extension of Cauchy's Theorem for multiply connected regions- Cauchy's Integral Formula.

UNIT-V (12 classes)

Power series - Taylor's Series - Laurent's Series - Zeros and Singularities – Residues – Cauchy's Residue Theorem -Evaluation of Real Integrals using Residue Theorem -Bilinear Transformation - Conformal Mapping.

Learning Resources:

1. Advanced Engineering Mathematics - R.K.Jain & S.R.K.Iyengar 3rd Edition, Narosa Publications
2. Higher Engineering Mathematics, Dr.B.S Grewal 40th Edition, Khanna Publishers.
3. Laplace's and Fourier transforms Goyal & Gupta, Pragati prakashan
4. Kreyszig E, Advanced Engineering Mathematics, 8th Edition, John Wiley & Sons Ltd, 2006.
5. A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.
6. Higher Engineering Mathematics, H.K. Dass, Er.Rajnish Verma 2011 Edition S.Chand & company Ltd.
7. R.V. Churchill, "Complex Variables & its Applications".Mc Graw-Hill Book Company, INC

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 II-SEMESTER

FINISHING SCHOOL-II

Instruction : 2+1 Periods/ week	Sem Exam Marks : 70	Subject Reference Code: **HS 2250**
Credits : 2	Sessional Marks : 30	Duration of Sem Exam:3 Hrs

Course Objectives	Course Outcomes
The objectives of this course are to: • Identify the various features and functions of human language and communication. • Develop the habit of listening effectively so as to analyze the speaker's tone and tenor. • Choose the appropriate words so as to speak and write accurately. • Read various types of texts and sift information correctly. • Write notes and letters for personal and official purposes.	On completion of the course the student will be able to: • Listen and analyze context, tone and tenor before responding to others. • Begin, sustain and end conversation. • Respond to people in different situations. • Read with adequate speed and comprehend various texts. • Use words appropriately in different contexts for speaking and writing. • Use markers in written discourse. • Construct grammatically correct sentences to write effectively.

SECTION-A
Soft Skills (35 Marks)

UNIT-I: ORAL COMMUNICATION: LANGUAGE FUNCTION IN CONTEXT

- Interpreting a conversation
- Apologizing and responding to apologies
- Expressing opinions
- Complimentary close to a conversation
- Expressing sympathy and condolences
- Describing process

UNIT II: AURAL COMMUNICATION: LISTENING TO VARIOUS SPEAKERS AND TEXTS

- Listening for gist and specific information
- Note-taking
- Listening to identify cohesive devices and coherence in discourse

UNIT III: READING: COMMUNICATING WITH A GIVEN TEXT

- For supporting details to the main idea
- Note Making
- For discourse structure
- For basic referential and in inferential information

UNIT IV: WRITING: PERSONAL AND OFFICIAL COMMUNICATION

- Letters
- Email Etiquette
- Reports
- Resume writing

UNIT V: GRAMMAR- ADVANCED LEVEL

- Relative clauses
- Subject verb
- Prepositions
- Common errors

VOCABULARY- ADVANCED LEVEL

- Collocations
- Phrasal verbs
- Idioms
- Adjectives for descriptions

SECTION-II
Technical Skills (35 Marks)

Introduction to object oriented programming
Classes
Member variables
Member functions / methods
Constructor & Destructor
Inheritance
Virtual base class
Abstract base class
Polymorphism
Function over loading
Operator over loading

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 II-SEMESTER

APPLIED THERMODYNAMICS LAB

Instruction : 3 Periods/ week	Sem Exam Marks : 50	Subject Reference Code: **ME 2021**
Credits : 2	Sessional Marks : 25	Duration of Sem Exam:3 Hrs

Course Objectives	Course Outcomes
Student shall: • perform experiments on various types of I.C.Engines and two stage air compressor. • Conduct experiments on Viscometer and flash and fire point apparatus	student will be able to: • Determine volumetric efficiency and isothermal efficiency of a two stage air compressor. • Draw port timing diagram on two stroke engine valve timing diagram on four stroke engine • Evaluate the performance of Internal combustion engine • Prepare heat balance sheet on Internal combustion engine • Determine absolute and kinematic viscosity of an given lubricating oil using Viscometer

List of Experiments:

1. To determine volumetric efficiency, isothermal efficiency and mass flow rate of a two stage reciprocating air compressor.
2. To determine valve/ port timing diagram of a Petrol/Diesel engine.
3. To conduct performance test on single cylinder Diesel engine.
4. To conduct heat balance test on a Diesel engine.
5. To conduct performance test on multi cylinder Petrol engine.
6. To conduct performance test on a two-stroke Petrol engine.
7. To conduct performance test on twin cylinder Diesel engine.
8. To study performance of a Petrol engine under different compression ratios.
9. To conduct Morse test on multi cylinder Petrol engine.
10. Exhaust gas analysis of Petrol engine for carbon-monoxide and unburnt hydrocarbons.
11. Exhaust gas analysis of Diesel engine for carbon deposits using smoke meter.
12. Determination of viscosity of lubricating oil.
13. Determination of flash and fire points of a fuel

Note: Minimum 12 experiments to be conducted

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E. 2/4 II-SEMESTER

ELECTRICAL CIRCUITS AND MACHINES LAB
(for Mechanical Engineering)

Instruction : 3 Periods/ week	Sem Exam Marks : 50	Subject Reference Code: **EE 2111**
Credits : 2	Sessional Marks : 25	Duration of Sem Exam:3 Hrs

Course Objectives	Course Outcomes
• To impart the practical knowledge on basic theorems, measuring of 3-phase power, performance and speed control of DC machines and AC machines.	• Identify suitable instruments in the application of DC and AC machines. • Analyze the performance and speed control of DC Machines. • Analyze the performance and speed control of Induction motor. • Analyze the performance of single phase transformer. • Compute a 3-phase power by using 2-Watt meters.

List of Experiments:

1. Verification of Thevenin's and Norton's Theorems
2. Measurement of 3-Phase Power by Two Wattmeter Method
3. Study of Single-Phase R, L & C Series & Parallel Circuits
4. Study of Self and Mutual Inductance of Coils and their Interconnections
5. Magnetization Curve of a Separately Excited DC Generator
6. Load Characteristics of a DC Shunt Generator
7. Performance Characteristics of a DC Shunt Motor
8. Performance Characteristics of a DC Compound Motor
9. Performance Characteristics of a DC Series Motor
10. Speed Control of DC Shunt Motor.
11. O.C. and S.C. Tests on Single - Phase Transformer.
12. Performance Characteristics of 3-Phase Induction Motor.
13. Speed Control Methods of Induction Motors.

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

SYLLABUS FOR B.E. 2/4 II-SEMESTER
APPLIED ELECTRONICS LAB
(for Mechanical Engineering)

Instruction : 3 Periods/ week	Sem Exam Marks : 50	Subject Reference Code: **EC 2491**
Credits : 2	Sessional Marks : 25	Duration of Sem Exam:3 Hrs

Course Objective	Course Outcomes
• Lab course enables the students to verify the characteristics of various electronic devices & circuits.	Students will able to: • Identify different electronic components & devices. • Verify Input/output characteristics of active devices and to compute their parameters. • Perform operations such as addition, subtraction, comparison of voltage levels using operational amplifiers • Implement digital adders & sub-tractors using logic gates. • Program 8051 microcontroller for simple 8-bit arithmetic operations & to interface 8051 with external peripherals.

List of Experiments:

1. Characteristics of Semiconductor and Zener diodes
2. CRO Applications
3. Full-wave rectifier with and without filter
4. Zener Voltage Regulator
5. Characteristics of BJT transistor (CB, CE, CC)
6. Feedback amplifier and amplifier without feedback
7. Phase shift oscillator
8. Hartley oscillator & Colpitts Oscillator.
9. Operational Amplifier and it's applications
10. Logic gates and flip flops-verifications
11. Realization of Half and Full adder
12. Characteristics of SCR
13. Arithmetic operations (8 bit) using 8051 Microcontroller
14. Interfacing applications using 8051 Microcontroller

General Note:

1. 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.

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 II-SEMESTER

MECHANICAL TECHNOLOGY
(for Civil Engineering)

Instruction : 2 Periods/ week	Sem Exam Marks : 35	Subject Reference Code: **ME 2080**
Credits : 2	Sessional Marks : 15	Duration of Sem Exam:3 Hrs

Course Objectives	Course Outcomes
The objectives of this course are to: • Learn the basic principles of excavating equipment, conveying equipment hoisting equipment, concrete producing equipment and pneumatic equipment	On completion of the course the student will be able to: • Demonstrate the applications of Earth Moving Equipments . • Determine the working principles and applications of Conveying Equipment & Hoisting Equipment. • Determine the Mechanism Involved in Concrete Producing Equipments and Pneumatic Equipment.

UNIT– I

Excavating Equipment: General description, operation, maintenance and selection of the following: Earth moving and Excavating Equipment: Shovels, Dragline, Clamshell, Cable excavator, Bucket wheel excavator, Tractor, Bulldozer, Scraper, Trenchers, Grader, Earth Compactors.

UNIT– II

Conveying Equipment: Belt conveyor, Screw Conveyor, Bucket Conveyor, Apron Conveyor, Aerial Ropeway.

Hoisting Equipment: Hoist winch. Differential and Worm geared chain hoists. Fork lift trucks, Guyed and stiffly derricks, swing and non– swing mobile crane, whirler crane, Construction elevator, passenger lift and Bucket elevators.

UNIT– III

Aggregate and Concrete Producing Equipment: Crushers – Jaw, Gyratory, Hammer and Roll Crushers, Screens – Stationary, Shaking and Vibrating screens. Concrete mixers and Concrete pumps.
Pneumatic Equipment: Reciprocating air– compressor, construction pneumatic tools; jack hammer, paving breaker, Rock drill, concrete vibrator.

Learning Resources:

1. R.L. Peurifoy, Construction Planning Equipment and Methods, McGraw Hill Publishers, 1956
2. Mahesh Varma, Construction Equipment and its planning and application, Metropolitian books Co, Delhi,2004
3. Goodes Spence, Building and Civil Engineering Plant, Crosby Lock Wood, 1995

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 2/4 II-SEMESTER

MECHANICAL TECHNOLOGY LAB
(For EEE)

Instruction : 3 Periods/ week	Sem Exam Marks : 50	Subject Reference Code: **ME 2031**
Credits : 2	Sessional Marks : 25	Duration of Sem Exam:3 Hrs

Course Objectives	Course Outcomes
The objectives of this course are to: • Conduct experiments by applying principles of heat transfer and Refrigeration • conduct experiments on I. C. Engines and two stage air compressor • conduct experiments on flow meters, hydraulic pumps and turbines	the student will be able to: • Evaluate the performance of internal combustion engine • Analyze the performance of multi stage air compressor • Determine the flash and fire point of a given fuel using flash and fire point apparatus. • Calculate the hydraulic efficiency, discharge and power output of hydraulic turbines and pumps • Plot the theoretical discharge Vs actual discharge using venture meter and orifice meter.

List of Experiments:

1. Performance test on multi cylinder/single cylinder diesel engine.
2. Measurement of discharge by venture meter.
3. Measurement of discharge by Orifice meter.
4. Determination of heat flow through lagged pipe
5. Determination of Heat transfer coefficient under Natural Convection
6. Determination of volumetric efficiency and Isothermal Efficiency of Two stage reciprocating air compressor
7. Performance characteristics of Francis Turbine
8. Performance characteristics of Pelton wheel
9. Performance characteristics of reciprocating pump
10. Performance characteristics of centrifugal pump
11. Determination of effectiveness of parallel flow and counter flow heat exchanger
12. Determination of COP refrigeration test rig

BRIDGE COURSE

VASAVI COLLEGE OF ENGINEERING (Autonomous)

9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

Department of Civil Engineering

SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER
(w.e.f. the academic year 2015-16)

ENGINEERING MECHANICS

(for All branches of 2/4 B.E-I SEMESTER)

Instruction :2 periods week	Subject Reference Code: **CE2080**
Semester Exam Marks : **50**	Duration of Semester Exam: **3 Hrs**

COURSE OBJECTIVES	COURSE OUTCOMES
1. To **learn** the resolution of a system of spatial forces. 2. To **assess** the frictional forces on rigid body. 3. To **understand** the concepts of dynamics and its principles. 4. To **explain** kinetics and kinematics of particles, projectiles, curvilinear motion and centroidal motion. 5. To **impart** the concepts of work-energy method and its applications to rectilinear translation, centroidal motion.	***students will be able to:*** 1. **Judge** whether the body under the action of spatial force system. 2. **Solve** problem of bodies subjected to friction. 3. **Distinguish** between statics and dynamics and differentiate between kinematics and kinetics. 4. **Understand** the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion. 5. **Know** the concepts of work and energy principles subject and derive the work energy equations for translation, rotation and connected systems.

UNIT-I (3 periods)

Force Systems: Components of forces, moments in space and its applications.

UNIT-II (4 periods) :

Friction: Laws of friction. Application to simple systems and wedge friction.

UNIT-III (5 periods) :

Kinematics: Rectilinear motion, curvilinear motion, Velocity and acceleration of a particle.

UNIT-IV (6 periods) :

Kinetics: Analysis as a particle. Analysis as a rigid body in translation. Fixed axis rotation and Rolling bodies.

UNIT-V (5 periods) :

Work Energy: Principles of work-energy, and its application to translation, Particle motion and connected systems.

Learning Resource:

1. F.L.Singer, "Engineering Mechanics", Harpper & Collins, Singapore 1994.
2. S.P.Timoshenko and D.H.Young, "Engineering Mechanics", McGraw Hill International Edition, 1983
3. Andrew Pytel., Jaan Kiusalaas., "Engineering Mechanics", Cengage Learning, 2014.
4. F.P.Beer & E.R.Johnston, "Jr. Vector Mechanics for Engineers", TMH, 2004.
5. R.C.Hibbeler & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2008.
8. Meriam. J. L., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2008.
9. NPTEL Course and Virtual labs on the web.

With effect from the Academic Year 2015-16

DEPARTMENT OF PHYSICS

SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER

Physics of Materials (Section -I)

(for All branches of 2/4 B.E-I SEMESTER)

Instruction :1 period week	Subject Reference Code: **PH2130**
Semester Exam Marks : **25**	Duration of Semester Exam: **90 Min**

Course objectives	Course Outcomes *Student should be able*
• To apply basic principles of physics in field of engineering • Analyze the characteristics of semiconductor devices • To take up research at Undergraduate Level in new and emerging areas like materials science including magnetic, dielectrics and nanotechnology	• Differentiate properties, characteristics and applications of various materials like magnetic, dielectric and semiconducting materials • Inquire the new trends in interdisciplinary research area such as Magnetic materials, dielectric materials Semiconductors and nanotechnology

Unit -I

1. Dielectric Materials: (3 periods)

Polar and Non polar dielectrics-Different types of polarizations in dielectrics- Ferro-electric materials: properties and applications.

2. Magnetic Materials: (3 periods)

Ferro, Ferri and anti-ferro magnetic materials and their properties, Domain theory of ferromagnetism- Hysteresis (B-H) curve-soft and hard magnetic materials.

Unit – II:

1. Semiconductor Devices: (3 periods)

Fermi energy in semiconductor- Intrinsic carrier concentration of semiconductor-Characteristics of Photo diode and solar cell

2. Nano Materials: (3 periods)

Distinction between Bulk, thin and nano material-Surface to volume ratio-Quantum confinement-Basic properties of nano-materials, Applications of Nano materials and CNT's.

LEARNING RESOURCES:

1. Introduction to Solid State Physic*s,* Kittel C, Wiley Eastern
2. A text book of Engineering Physics, Avadhanulu & Kshirasagar
3. Applied Physics for Engineers, Neeraj Mehta, PHI
4. N Chattopadhyay, K. K.Banerjee-Introduction to Nanoscience and Nanotechnology, PHI

DEPARTMENT OF MATHEMATICS

SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER

Mathematics (Section-II)

(for All branches of 2/4 B.E-I SEMESTER)

Instruction :1 period week	Subject Reference Code: **MA2040**
Semester Exam Marks : **25**	Duration of Semester Exam: **90 Min**

Course Objectives	Course Outcomes
• To understand the statistical concepts measures of central tendency, the addition and multiplication theorems of probability , discrete random variable • To practice the integration by substitution, integration by parts, multiple integrals problems • To understand the concepts of on the applications of integration to find areas, surface areas, volume of solid of revolution	• The student is able to understand the statistical concepts measures of central tendency, the addition and multiplication theorems of probability, discrete random variable • The Student is able to solve the problems on integration by substitution, integration by parts and multiple integrals • The student is able to understand the concepts on the applications of integration to find areas, surface areas, volume of solid of revolution

Unit -I (6 Periods):

Basics of Statistics & Probability:

Measures of central tendency (Mean, Median & Mode) - Definition of Probability –Basic problems of Probability- Addition & Multiplication theorems- Discrete random variable

Unit -II (6 Periods):

Integral Calculus: Methods of integration (Integration by substitution and integration by parts)-Multiple Integrals -Applications of Integration - areas - Surface areas - Volume of solid of revolution

LEARNING RESOURCES:

1. Higher Engineering Mathematics by B.S. Grewal.
2. Fundamentals of Mathematical Statistics by Gupta & Kapoor
3. Integral calculus by Shantinarayan.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER

Instruction :2 periods week	Subject Reference Code: **CS 2091**
Semester Exam Marks : 50	Duration of Semester Exam: 3hr

C-PROGRAMMING LAB
(for All branches of 2/4 B.E-I SEMESTER)

1. Finding roots of quadratic equation
2. Check whether a given number is (i) Prime (ii) Perfect (iii) Strong
3. Sin x and Cos x values using series expansion.
4. Menu driven program to calculate income tax
5. Generating Pascal's Triangle
6. Frequency of occurrence of characters and special characters like \n, \t, white spaces.
7. Bubble sort, Selection sort using arrays
8. Linear search and Binary Search.
9. Functions to find maximum and minimum of given set of numbers, interchange two numbers
10. Recursion: Factorial, Fibonacci, GCD of given numbers
11. Functions for string manipulations without using library functions
12. String comparisons and sorting using pointers to strings.
13. Matrix addition and multiplication using pointers
14. Programs on Structures and Unions
15. File handling programs, Finding the no: of characters, words and lines of given text file.
16. **Mini Project**: Simple application using the concepts of C language

Learning Resources:

1. B.A.Forouzan & Richard F.Gilberg, *A Structured Programming Approach using C*, 3rd Edition, Cengage Learning, 2013
2. Brian W. Kernighan and Dennis M. Ritchie, *The C Programming Language,* 2nd Edition, Prentice-Hall, 2006
3. E.Balagurusamy, *Programming in ANSI C*, TMG, 4th Edition, 2008.

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

SYLLABUS FOR BRIDGE COURSE BE 2/4 – SECOND SEMESTER

ELT-LAB

(for All branches of 2/4 B.E-II SEMESTER)

Instruction :2 periods week	Subject Reference Code: **HS2231**
Semester Exam Marks : 50	Duration of Semester Exam: 2hrs

Course objectives	Course Outcomes *Student should be able*
• Use language effectively without mother tongue influence. • Converse in various situations. • Make paper and power point presentations. • Listen to audio clippings, exchange dialogues and write short texts. • Speak effectively using discourse markers. • Read and understand various forms of texts and review them.	• Pronounce words in isolation as well as in spoken discourse. • Research and sift information to make presentations. • Comprehend the tone and tenor of various types of speeches from media and classroom lectures. • Listen for gist and make inferences from various speeches. • Identify connectives and transitions in various speeches. • Use connectives and make transitions effectively while speaking

PHONETICS LAB- TOPICS

1 **Introduction to English Phonetics:** Introduction to auditory, acoustic and articulatory phonetics. Organs of speech: the respiratory, articulatory and phonatory systems

2 **Sound System of English:** Phonetic sounds, Introduction to International Phonetic Alphabet, Classification and Description of English Phonemic sounds; Minimal pairs: The Syllable: Types of syllables; Difficulties of Indian speakers with sound of English.

3 **Rhythm and Intonation:** Introduction to rhythm and intonation; Major patterns of intonation in English with their semantic implications; difficulties of Indian speakers with sound of English.

INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS

1 **Group discussion:** Objectives of GD, Types of GDs; Initiating, Continuing, and concluding a GD.

2 **Debate:** Understanding the differences between a debate and a group discussion, essentials of debate, concluding a debate.

3 **Presentation Skills:** Making Effective Presentations, Expressions which can be used in Presentations, Use of Non-Verbal Communication, Coping with Stage Fright, Handling Question and Answer Session; Use of Audio-Visual Aids, PowerPoint Presentations.

4 **Public Speaking:** Advantages of public speaking, essentials of an effective speech, types of delivery, rehearsal techniques, planning and delivering a speech.