Course Structure for B.Tech (Mechanical Engineering) Regular Programme

Applicable for students admitted from 2016-17 Academic Year

B.Tech 1st Semester – Mechanical Engineering

S.No	Code	Course	L	T	P	Drg	C
1	16HS1101	Professional English-I	3	0	0	0	3
2	16HS1102	Calculus and Differential Equations	3	1	0	0	3
3	16HS1103	Applied Physics	3	1	0	0	3
4	16HS1105	Environmental Studies	3	0	0	0	3
5	16ME1101	Engineering Mechanics	3	1	0	0	3
6	16HS2106	Professional English Lab	0	0	3	0	2
7	16HS2107	Applied Physics Lab	0	0	3	0	2
8	16ME2104	Engineering Workshop and IT Workshop	0	0	3	0	2
		TOTAL	**15**	**3**	**9**	**0**	**21**

B.Tech 2nd Semester – Mechanical Engineering

S.No	Code	Course	L	T	P	Drg	C
1	16HS1201	Professional English-II	3	0	0	0	3
2	16HS1202	Integral Transforms	3	1	0	0	3
3	16HS1104	Applied Chemistry	3	1	0	0	3
4	16CS1101	Computer Programming	3	0	0	0	3
5	16EE1101	Basic Electrical and Electronics Engineering	3	1	0	0	3
6	16HS2108	Applied Chemistry Lab	0	0	3	0	2
7	16CS2102	Computer Programming Lab	0	0	3	0	2
8	16ME2103	Engineering Drawing Practice	0	0	0	3	2
		TOTAL	**15**	**3**	**6**	**3**	**21**

B.Tech 3rd Semester – Mechanical Engineering

S.No	Code	Course	L	T	P	Oth	C
1	16HS1302	Probability and Statistics	3	1	0	0	3
2	16CS1305	Introduction to Data Structures	3	0	0	0	3
3	16ME1301	Mechanics of Solids	3	1	0	0	3
4	16ME1302	Fluid Mechanics and Hydraulic Machinery	3	1	0	0	3
5	16ME1303	Engineering Thermodynamics	3	1	0	0	3
6	16ME1304	Engineering Graphics with Auto CAD	3	0	0	0	3
7	16ME2305	Material Testing Lab	0	0	3	0	2
8	16ME2306	Fluid Mechanics and Hydraulic Machinery Lab	0	0	3	0	2
9	16EE2307	Basic Electrical and Electronics Engineering Lab	0	0	3	0	2
10	16AS3301	Communication Skills Practice	0	0	0	3	1
11	16AS3302	Professional Society Activities-I	0	0	0	3	1
12		Audit Course					
		TOTAL	**18**	**4**	**9**	**6**	**26**

B.Tech 4th Semester – Mechanical Engineering

S.No	Code	Course	L	T	P	Oth	C
1	16HS1401	Matrices and Numerical Methods	3	0	0	0	3
2	16ME1401	Material Science	3	1	0	0	3
3	16ME1402	Manufacturing Technology	3	1	0	0	3
4	16ME1403	Internal Combustion Engines	3	1	0	0	3
5	16ME1404	Kinematics of Machinery	3	1	0	0	3
6	16ME1405	Machine Drawing	3	0	0	0	3
7	16ME2406	Material Science Lab	0	0	3	0	2
8	16ME2407	Manufacturing Technology Lab	0	0	3	0	2
9	16ME2408	Internal Combustion Engines Lab	0	0	3	0	2
10	16AS3401	Technical Seminar	0	0	0	3	1
11	16AS3402	Soft Skills Practice	0	0	0	3	1
12	16AS3403	Professional Society Activities-II	0	0	0	3	1
		TOTAL	**18**	**4**	**9**	**9**	**27**

B.Tech 5th Semester – Mechanical Engineering

S.No	Code	Course	L	T	P	Oth	C
1	16MB1411	Engineering Economics and Project Management	3	0	0	0	3
2	16CS1402	OOPs through JAVA	3	0	0	0	3
3	16ME1501	Machines Tools and Metrology	3	1	0	0	3
4	16ME1502	Turbo Machines	3	1	0	0	3
5	16ME1503	Design of Machine Elements-I	3	1	0	0	3
6	16ME1504	Dynamics of Machinery	3	1	0	0	3
7	16CS2409	OOPs through JAVA Lab	0	0	3	0	2
8	16ME2505	IC Engines Testing Lab	0	0	3	0	2
9	16ME2506	Machine Tools Lab	0	0	3	0	2
10	16AS3501	Term Paper	0	0	0	3	2
11	16AS3502	Quantitative Aptitude	0	0	0	3	1
12	16AS3503	Professional Activities-III	0	0	0	3	1
		TOTAL	**18**	**4**	**9**	**9**	**28**

B.Tech 6th Semester – Mechanical Engineering

S.No	Code	Course	L	T	P	Oth	C
1	16ME1601	Heat Transfer	3	1	0	0	3
2	16ME1602	CAD/ CAM	3	1	0	0	3
3	16ME1603	Design of Machine Elements-II	3	1	0	0	3
4	16ME1604	Industrial Engineering and Management	3	0	0	0	3
5	16ME1605	Production Drawing	3	0	0	0	3
6	**ELECTIVE-I**						
	16ME1606	Metal Forming	3	1	0	0	3
	16ME1607	Finite Element Methods					
	16ME1608	Gas Turbines and Jet Propulsion					
	16ME1609	Available Selected MOOCs					
7	16ME2610	Metrology Lab	0	0	3	0	2
8	16ME2611	Heat Transfer Lab	0	0	3	0	2
9	16ME2612	CAD Lab	0	0	3	0	2
10	16ME2613	Mini Project	0	0	0	3	2
11	16AS3601	Technical Aptitude	0	0	0	3	1
12	16AS3602	Professional Society Activities-IV	0	0	0	3	1
		TOTAL	**18**	**4**	**9**	**9**	**28**

B.Tech 7th Semester – Mechanical Engineering

S.No	Code	Course	L	T	P	Oth	C
1	16ME1701	Automobile Engineering	3	1	0	0	3
2	16ME1702	Instrumentation and Control Systems	3	1	0	0	3
3	13ME1703	Operations Research	3	0	0	0	3
4	**ELECTIVE-II (OPEN ELECTIVE)**		3	1	0	0	3
5	**ELECTIVE-III**						
	13ME1704	Unconventional Machining Process	3	1	0	0	3
	13ME1705	Mechatronics					
	13ME1706	Power Plant Engineering					
	13ME1707	Available Selected MOOCs					
6	13ME2710	Dynamics and Measurements Lab	0	0	3	0	2
7	13ME2711	CAM Lab	0	0	3	0	2
8	13ME2712	Instrumentation and Control Systems Lab	0	0	3	0	2
9	16AS3701	Internship	0	0	0	3	2
10	16AS3702	Professional Society Activities-V	0	0	0	3	1
		TOTAL	**15**	**4**	**9**	**6**	**24**

B.Tech 8th Semester – Mechanical Engineering

S.No	Code	Course	L	T	P	Oth	C
1	**ELECTIVE-IV**						
	16ME1801	Production and Operations Management	3	1	0	0	3
	13ME1802	Tool Design					
	13ME1803	Computational Fluid Dynamics					
	16ME1804	Composite Materials					
2	**ELECTIVE-V**						
	13ME1805	Advances in Casting and Welding Processes	3	1	0	0	3
	16ME1806	Industrial Tribology					
	16ME1807	Production Planning and Control					
	16ME1808	Available Selected MOOCs					
3	**ELECTIVE-VI**						
	16ME1809	Total Quality Management	3	1	0	0	3
	16ME1810	Refrigeration and Air Conditioning					
	16ME1811	Mechanical Vibrations					
	16ME1812	Geometric Modeling					
4	16ME2813	Major Project and Comprehensive Viva-Voce	0	0	8	0	12
		TOTAL	**9**	**3**	**8**	**0**	**21**

ELECTIVE-II (OPEN ELECTIVE)

S.No	Code	Course
1	16CE1707	Disaster Management
2	16CE1708	Infrastructure Systems Planning
3	16EE1707	Renewable Energy Sources
4	16EE1708	Energy Auditing
5	16ME1708	Industrial Robotics
6	16ME1709	Nano Material Applications
7	16EC1707	Digital Image Processing (not for ECE)
8	16EC1708	Electronic Product Design and Packaging
9	16EC1709	Bio-Medical Instrumentation
10	16CS1708	Internet of Things
11	16CS1709	Open System Software
12	16MB1302	Entrepreneurship Development

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 1st Semester – Mechanical Engg	L	T	P	Oth	C
	3	0	0	0	3

16HS1101 PROFESSIONAL ENGLISH-I

COURSE OUTCOMES:

At the end of the course students able to

1 Developed functional skills for Professional practice through English.
2 Gained the ability to effectively communicate with members of society in general and engineering community in particular.
3 Inculcated an attitude to upgrade competence of English knowledge and communication.
4 Acquired fundamental and functional knowledge of English language, grammar and communication skills.
5 Identify and analyze productive skills and receptive skills.

UNIT-I

The Road Not Taken by **Robert Frost**

Communication: Importance of Communication – Language as a tool of Communication – Communicative Skills (Listening, Speaking, Reading and Writing), vocabulary words, prefixes, suffixes, common errors, Verbal and Non-Verbal communication

UNIT-II

Fare Well Party for Miss Pushpa T.S. by **Nissim Ezekiel**

Writing: Effective Sentence construction strategies – Grammaticality, removing ambiguity in sentences.

UNIT-III

No Men are Foreign by **James Kirkup**

Reading: Reading – Intensive and Extensive, Skimming, Scanning, paragraph writing, unity of theme, coherence, pattern of paragraph development.

UNIT-IV

Exercises on Letter Writing and Technical Report Writing

Remedial Grammar: Tenses**,** Use of Articles and Prepositions, Voice, Reported Speech.

TEXT BOOKS:

1 Text: Vibrant English 2014 Orient Black Swan
2 Meenakshi Raman and Sangeetha Sharma, Technical Communication, Oxford University Press, New Delhi, 2012.

REFERENCE BOOKS:

1 M. Ashraf Rizvi, Effective Technical Communication, Tata McGraw–Hill, Publishing Company Limited, First Edition, 2005.
2 Martin Hewings, Advanced English Grammar: A Self Study Reference and Practice Book for Advanced South Asian Students, Cambridge University press, First South Asian Edition, New Delhi, 1999.

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B.Tech 1st Semester – Mechanical Engg	L	T	P	Oth	C
	3	1	0	0	3

16HS1102 CALCULUS AND DIFFERENTIAL EQUATIONS

COURSE OUTCOMES:

At the end of the course students able to

1. find the solutions for maxima and minima problems which appear in engineering problems
2. understand the concepts of curvature and use them in various engineering disciplines
3. evaluate areas and volumes using multiple integrals
4. gain the knowledge of vector differentiation and solve the problems of various engineering disciplines acquire the knowledge of differential equations
5. summarize and utilize them in various Engineering Problems.
6. form and solve various PDEs

UNIT-I

Functions of Several variables

Functions of two or more variables – Partial Derivatives – Total derivative – Jacobians – Taylor's theorem for functions of two variables (without proof) – Maxima and Minima of functions of two variables and Lagrange's method of undetermined multipliers

UNIT-II

Curvature and Multiple Integrals

Curvature – Radius of Curvature for Cartesian and Polar Curves - Radius of Curvature at the origin - Evaluation of Double Integrals – Change of Order of Integration - Change of Variables - Evaluation of Triple Integrals

Areas and Volumes using multiple integrals

UNIT-III

Vector Calculus

Differentiation of vectors – Gradient – Divergence – Curl – Line Integral - Gauss's Divergence Theorem, Green's theorem in a plane , Stoke's Theorem (without proofs)

UNIT-IV

Differential Equations (0DE & PDE)

Differential equations of first order - Exact, linear and Bernoulli equations - Orthogonal trajectories, Newton's cooling, law of growth and decay- Illustrations.

Differential equations of second and higher order- with RHS terms e^{ax}, Sin ax / Cos ax, x^n (n is +ve integer), e^{ax} V [V is sin ax or cos ax or polynomial in x], x^n V [V is sin ax/ cos ax] - Variation of parameters - Applications to Oscillatory Electrical Circuits – Formation of PDEs by the elimination of arbitrary constants and arbitrary functions-Method of separation of variables

TEXT BOOKS:

1 Higher Engineering Mathematics - Dr. B.S. Grewal – 42nd Edition - Khanna Publications
2 A Text Book of Engineering Mathematics – I - T.K.V. Iyengar, B. Krishna Gandhi and Others - S. Chand & Company – Revised edition 2013

REFERENCE BOOKS:

1 Advanced Engineering Mathematics – E. Kreyzig – 10th Edition – Wiley Publications
2 A Text Book of Engineering Mathematics, B.V. Ramana - Tata McGraw Hill Publications
3 Advanced Engineering Mathematics – RK Jain & SRK Iyengar – Revised edition – Taylor & Fransis - 2002
4 E.Rukmangadachari & E. Keshava Reddy ,Engineering Mathematics , Volume-I, 2nd Edition-Pearson publishers
5 Websites: www.wolframalpha.com www.mathforum.org www.math.duke.edu

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B.Tech 1st Semester – Mechanical Engg	**L**	**T**	**P**	**Oth**	**C**
	3	1	0	0	3

16HS1103 APPLIED PHYSICS

COURSE OUTCOMES:

At the end of the course students able to

1 To understand the super position effects like Interference, Diffraction and Polarization and to list the types of optical fibers and using optical fibers in modern communication system and medical field
2 To interpret the different crystal systems, crystal structure determination by X-rays
3 To summarize the concepts of LASERS, different types of LASERS and its applications
4 To Study Quantum Mechanics and how Quantum Mechanics is carried out in the fields like medicine and industry
5 To understand the concepts of Superconductivity and to understand properties of Magnetic and Dielectric Materials and its applications
6 To analyze various types of Nanomaterials, significance of low dimensional materials, useful applications of Nanotechnology in various field like medicine, biological, chemical, industrial and many important areas in science and technology

UNIT-I

OPTICS

Interference: Introduction – Interference in thin film by reflection –Newton's rings

Diffraction: Introduction - Fraunhoffer diffraction due to single slit, Diffraction grating.

Polarization: Types of polarization-Nicol's prism-production and detection of different polarizations.

UNIT-II

FIBER OPTICS & LASERS

Fiber optics: Construction of optical fiber-Principle of optical fiber- Acceptance angle and acceptance cone - Numerical aperture- Types of optical fibers – Optical fiber communication system and its advantages - Applications of optical fibers

Lasers*:* Introduction-Characteristics of laser – Spontaneous and stimulated emission of radiation – Population inversion - pumping methods -Ruby laser- He-Ne laser - Applications of lasers

UNIT-III

PRINCIPLES OF QUANTUM MECHANICS AND SEMICONDUCTORS

Principles of Quantum Mechanics*:* Waves and particles – de-Broglie hypothesis- Matter waves-Heisenberg uncertainty principle - Schrodinger's time independent wave equation – Physical significance of wave function - Particle in one dimensional infinite potential box.

Semiconductors: Introduction-Fermi level in Intrinsic and Extrinsic semiconductors-law of mass action – Drift & diffusion currents - Einstein's equation – Hall Effect.

UNIT-IV

CRYSTALLOGRAPHY, SUPERCONDUCTORS AND NANO MATERIALS

Crystallography and X-Ray Diffraction: Introduction – Space lattice-Basis –Unit cell – Lattice parameters –Bravais lattices – Crystal systems- Expression for lattice constant–Packing fractions of SC, BCC and FCC – Miller indices – Expression for Interplanar spacing in cubic crystals – X-ray diffraction - Bragg's law

Superconductors*:* Introduction - properties of super conductors - Meissner effect – Type I and Type II superconductors – BCS theory- Applications of superconductors.

Magnetic Materials: Basic Definitions-classification of magnetic materials-hysteresis-soft and hard magnetic materials.

Dielectric Materials: Basic Definitions-Internal Field-Clausius-Mossitti Equation-Dielectric Loss-Applications.

Nano materials: Basic principles of nanomaterials – properties of nanomaterials: Physical, optical, thermal, mechanical and magnetic properties–Applications of nanomaterials

TEXT BOOKS:

1 K.Thyagarajan, Engineering Physics, I Edition 2013, Tata Macgraw Hill
2 P.K.Palanisamy , Engineering Physics, II Edition 2010 Scitech Publishers

REFERENCE BOOKS:

1 A.J. Dekkar , Solid State Physics , Latest edition, 2012. McMillan Publishers
2 M. Arumugam , Engineering Physics II Edition, 1997 , Anuradha Publications
3 S. ManiNaidu ,Engineering Physics, I Edition, 2012. Pearson Education
4 Gaur and Gupta Dhanapati , Engineering Physics, 7th Edition, 1992 Rai Publishers
5 B S Murthy, P.Shankar, Baldev Raj B BRath, James Murday , I Edition, 2012
6 Text book of Nanoscience and Nanotechnology:, University Press,
7 Solid State Physics-S.O.Pillai
8 Nanotechnology Principles and Practices-Sulabh k. Kulkarni

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 1st Semester – Mechanical Engg	**L**	**T**	**P**	**Oth**	**C**
	3	0	0	0	3

16HS1105 ENVIRONMENTAL STUDIES

COURSE OUTCOMES:

At the end of the course students able to

1 Apply their knowledge in biology, chemistry, physics, earth science and economics for better understanding of earth's environment
2 Understanding the importance of natural resources
3 Comprehend the environmental problems from multiple perspectives with emphasis on human modern lifestyle and developmental activities
4 Recognize the inter connectedness of human dependence on the earth's ecosystems
5 Understanding the value of biodiversity and the conservation of biodiversity
6 Influence his society in proper utilization of goods and services
7 Able to apply waste water treatment
8 Demonstrate knowledge relating to the biological systems involved in the major global environmental problems of the 21st century

UNIT-I

Introduction to Environmental Studies & Natural Resources

Environment: Definition, scope, need for public awareness

Natural Resources: Renewable & Non renewable resources

Forest Resources: Use, Deforestation-Case Studies;

Water Resources: Use, Over-exploitation of surface and ground water, Environmental impacts of Dams, Floods and Droughts;

Food Resources: Changes caused by agriculture, over grazing; Effects of modern agriculture-fertilizer, pesticide problems, water - logging and salinity;

Energy Resources: Renewable & non renewable energy resources, Use of alternate energy sources

UNIT-II

Ecosystems & Biodiversity

Ecosystems: Definition, Structure of an ecosystem

Functions of ecosystem- Food chains, Food web, Energy flow, Ecological pyramids

Types of Ecosystems: Forest Ecosystem, Aquatic Ecosystem

Biodiversity: Definition, levels of biodiversity, Value of biodiversity, Hotspots of biodiversity,

India as mega biodiversity nation, Threats to biodiversity- Poaching, Habitat loss, Endangered & endemic species of India, Conservation of biodiversity: In-situ & Ex-situ conservation

UNIT-III

Environmental Pollution

Pollution: Definition, Causes & Control measures of Air pollution, Water pollution, Soil pollution, noise pollution, Solid waste management - Causes, effects and control measures Role of an individual in preventing pollution

UNIT-IV

Social Issues & Environment

From unsustainable to sustainable development, water conservation, rain water harvesting, watershed management, environmental ethics & issues, possible solutions, ozone layer depletion, global warming, consumerism & waste products.

Environment protection acts: Air (Prevention and Control of Pollution) Act – Water (Prevention and Control of Pollution) Act - Wild life Protection Act- Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public awareness

TEXT BOOKS:

1 Text book of Environmental Studies for Undergraduate Courses by Erach.Bharucha for University Grants Commission, Universities Press
2 Environmental Studies by R. Rajagopalan, Oxford University Press
3 Environmental Studies by Benny Joseph, Mc. Graw Hill Publications

REFERENCE BOOKS:

1 Kaushik A, Kaushik C.P, Perspectives in Environmental Studies, 3rd ed., New International Publishers
2 Text book of Environmental Sciences and Technology by M.Anji Reddy, BS Publication
3 Environmental Studies by Anindita Basak-Pearson education
4 Comprehensive Environmental Studies by J P Sharma, Laxmi Publications

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B.Tech 1st Semester – Mechanical Engg	**L**	**T**	**P**	**Oth**	**C**
	3	1	0	0	3

16ME1101 ENGINEERING MECHANICS

COURSE OUTCOMES:

At the end of the course students able to

1 Develop capacity to predict the effect of force and motion in the course of carrying out the design functions of engineering
2 Apply knowledge of trigonometry, calculus, and algebra to obtain solutions of elementary problems in engineering mechanics
3 Analyze select multi-body systems by drawing free-body diagrams, calculate kinematic characteristics, and derive Conditions of static/dynamic equilibrium
4 Provide preliminary information useful in design of components in a multi-body system under constraints

UNIT-I

Basics of Engineering Mechanics: Basic Concepts of Engineering Mechanics: Characteristics of a force – various types of force systems – Resultant – Composition and resolution of forces –Principles of moments of force – Couples.

Resultants of Force System: Resultants of different types of force systems.

Equilibrium of Forces: Free body diagrams – Equations of equilibrium for different force systems

UNIT-II

Frictional Resistance & Applications of Friction:

Frictional Resistance: Classification of friction- laws of friction –coefficient of friction-angle of friction – angle of repose – cone of friction – free body diagram-advantages-equilibrium of a body on a rough horizontal and inclined plane

Applications of Friction: Ladder friction – rope friction – wedge friction. Simple machines-concept of lifting machines-law of lifting machine

UNIT-III

Centroids and Centers of Gravity & Moments of Inertia:

Centroid and Centers of Gravity: Definition – Centroid and centers of gravity simple and composite bodies – Theorems of Pappus.

Moments of Inertia: Definition – Parallel axis theorem for areas – Second moments of areas by integration – Radius of gyration of areas – Moments of inertia of composite areas – Parallel axis and parallel plane theorems for masses – Moments of inertia of masses by integration – Radius of gyration of mass – Moments of inertia of composite masses(Simple Problems only)

UNIT-IV

Kinematics: Introduction, Rectilinear kinematics: Continuous motion, General curvilinear motion, Curvilinear motion: Rectangular components, Motion of a projectile, curvilinear motion: Normal and tangential components, Absolute dependent motion analysis of two particles.

Kinetics: Newton's law of motion, The equation of motion, Equation of motion for a system of particles, Equation of motion: Rectangular coordinates, Equation of motion: Normal and tangential Coordinates

TEXT BOOKS:

1 B. Bhattacharya, Engineering Mechanics- Oxford University Publications, 2009
2 S.S. Bhavikatti, Engineering Mechanics, New Age Internationals, 2nd edition, 2010

REFERENCE BOOKS:

1 A. K. Tayal, "Engineering Mechanics", Umesh Publications, 2005
2 Ferdinand.L.Singer, Engineering Mechanics (Statics and Dynamics), Harper Row Publishers.2007
3 Shames.I.H, Engineering Mechanics (Statics and Dynamics), Prentice – Hall of India- New Delhi, 2004
4 Timoshenko.S.P and Young.D.H, Engineering Mechanics, McGraw Hill Book Co. Ltd. 2003
5 S.Temoshenko,D.H.Young and J.V.Rao,Engineering Mechanics,Revised 4th Edition, Tata-McGraw-Hill Publishing Company Limited,New Delhi,2007
6 https://www.coursera.org/learn/engineering-mechanics
www.asce.org/engineering_mechanics

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B.Tech 1st Semester – Mechanical Engg	**L**	**T**	**P**	**Oth**	**C**
	0	0	3	0	2

16HS2106 PROFESSIONAL ENGLISH LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Gained practical knowledge in English Speech Sounds.
2 Developed ability on various language functions to fulfill the purpose of speaking and writing in academic and professional context.
3 Ability to communicate effectively in different formal and informal situations.
4 Demonstrate various language functions

UNIT-I

Phonetics: Vowels, Diphthongs and Consonants, Received Pronunciation, Transcription

UNIT-II

Stress (Word Stress & Sentence Stress), Intonation, Listening to various accents.
Just A Minute (Prepared & Extempore) & Situational Dialogues

UNIT-III

Listening to Telephone Conversations and Telephone Etiquette

UNIT-IV

Effective Group Discussion, Strategies for developing G.D.content, Maintaining direction,effective conclusion, -- towards consensus- Audio and video lesions for exposure to and comprehension of spoken English

REFERENCE BOOKS:

1 Daniel Jones, English Pronouncing Dictionary, Current Edition with CD
2 R. K. Bansal and J. B. Harrison, Spoken English, Orient Longman 2006 Edn
3 Krishna Mohan & NP Singh, Speaking English Effectively, (Macmillan)
4 J. Sethi, Kamlesh Sadanand & D.V. Jindal, A Practical Course in English Pronunciation, (with two Audio cassettes), Prentice-Hall of India Pvt. Ltd., New Delhi
5 Dr Shalini Verma , Body Language- Your Success Mantra , S.Chand & Co, 2008
6 English Dictionary for Advanced Learners, (with CD) International edn. Macmillan 2009

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B.Tech 1st Semester – Mechanical Engg	**L**	**T**	**P**	**Oth**	**C**
	0	0	3	0	2

16HS2107 APPLIED PHYSICS LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Understand principle, concept, working and application of new technology and comparison of results with theoretical calculations
2 Develop procedures and observational skills as data is taken and gain a fundamental understanding of simple and complex apparatus used in the experiment
3 Apply physics concepts to the research and development of new or improved technologies
4 Students will learn how to effectively work in a team environment when solving Engineering Physics related problems
5 Obtain and analyze scientific data from laboratory or field instruments

LIST OF EXPERIMENTS

1 Determination of radius of curvature of Plano convex lens- Newton's rings
2 Dispersive power of the prism-Spectrometer
3 Determination of wavelength of Spectral line of mercury spectrum using Diffraction grating -Normal Incidence
4 Determination of wave length of a laser source-Diffraction grating
5 Determination of particle size by using laser source
6 Numerical Aperture of an optical fiber
7 Magnetic field along the axis of a current carrying coil-Stewart and Gee's method
8 Determination of Energy gap of a material of a p-n junction
9 Determination of Rigidity modulus of a wire material-Torsional pendulum
10 Determination of thickness of a thin wire by using parallel fringes
11 Determination of frequency of an electrically vibrating tuning fork- Melde's method
12 Determination of Planck's Constant
13 Determination of Hall Coefficient of semi conductor.

TEXT BOOKS:

1 Manual cum Record for Engineering Physics Lab-1&2, by Prof. Sri M. Rama Rao, Acme Learning.
2 Physics lab Manual-Department of H&S, ASCET (Autonomous)

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B.Tech 1st Semester – Mechanical Engg	**L**	**T**	**P**	**Oth**	**C**
	0	0	3	0	2

16ME2104 ENGINEERING WORKSHOP AND IT WORKSHOP

ENGINEERING WORKSHOP

COURSE OUTCOMES:

At the end of the course students able to

1 Utilize workshop tools for engineering practice
2 Analyze and find out suitable method of fabrication of a given simple component.
3 Employ skills acquired to provide quick fixes for routine domestic and/or industrial problems.
4 Appreciate the hard work and intuitive knowledge of the manual workers.

Trades for Exercises

A Carpentry Shop

1 Cross Lap Joint
2 Mortise and Tenon Joint

B Fitting Shop

1 Square Fitting
2 V- Fitting

C Sheet Metal Shop

1 3-Sided Tray (Trapezoidal Tray)
2 Cylinder (Circular Tin)

D House Wiring

1 Wiring for two lamps (bulbs) with independent switch controls with or without looping
2 Wiring for stair case lamp

E Foundry

1 Single Piece Pattern
2 Double Piece Pattern

F Welding

1 Lap Joint
2 T – Joint

Trades for Demonstration

1 Machine Shop (Lathe Machine, Grinding Machine and Drilling Machine)
2 Metal Cutting
3 Plumbing

REFERENCE BOOKS:

1 Engineering Work shop practice, V. Ramesh Babu, VRB Publishers Private Limited, 2009
2 Work shop Manual, P.Kannaiah and K.L.Narayana, SciTech Publishers, 2009
3 Workshop Practice Manual, K. Venkata Reddy, BS Publications

IT WORKSHOP

COURSE OUTCOMES:

At the end of the course students able to

1 Understand the need of PC Hardware, internet & World Wide Web and office suites
2 Learn how to install different softwares
3 Install and use different software like Windows XP, Linux, and MSOffice suite component
4 Understand the troubleshooting techniques

LIST OF EXPERIMENTS:

PC Hardware:

Exercise 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Exercise 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Exercise 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Exercise 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Exercise 5: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva

Exercise 6: Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Internet & World Wide Web:

Exercise 7: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Exercise 8: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

MS Word:

Exercise 9&10: The mentor needs to give an overview of Microsoft (MS) word 2007: Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word. Give a task covering to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Inserting table, using Drawing toolbar in word.

MS Excel:

Exercise 11&12: The mentor needs to tell the importance of MS office 2007 Excel as a Spreadsheet tool covering Accessing, overview of toolbars, saving excel files, Using help and resources., Also give a task that is covering the features like Gridlines, Format Cells, Summation, auto fill, Formatting Text.

MS Power Point:

Exercise 13&14: Students will be working on MS power point that helps them create basic power point presentation. Topics covered during this Exercise include :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in Power point. Students shall be given a model power point presentation which needs to be replicated (exactly how it's asked).

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	3	0	0	0	3

16HS1201 PROFESSIONAL ENGLISH-II

COURSE OUTCOMES:

At the end of the course students able to

1 Use English language skills at basic level
2 Recognize the personal enrichment to be gained from a love of English, literature and learning
3 Acquired ability to interact politely and cooperate with others
4 Identify and compare different kinds of Resume styles
5 Design and develop functional skills in Professional contexts

UNIT-I

Text: The Eyes are Not Here by **Ruskin Bond**

Communication: Short oral presentation, Group Discussion- definition, types, structure, practice, Dynamics of group, clarity in thought and expression, Dos and Don'ts of GD

UNIT-II

Text: The Open Window by **Saki**

Communication: Resume Writing, format of Cover Letter

UNIT-III

Text: The Romance of a Busy Broker by **O Henry**

Communication: Interview Skills, Types of Interviews, Pre Interview Techniques, Types of Questions and Answering Strategies

UNIT-IV

Exercises on Common Errors in English, If- Clauses', One Word Substitutions, Idioms and Phrases, Words often Confused, Pre-fixes and Suffixes.

Text: Vibrant English 2014 Orient Black Swan

REFERENCE BOOKS:

1 Meenakshi Raman and Sangeetha Sharma, Technical Communication, Oxford University Press, New Delhi, 2012
2 1. M. Ashraf Rizvi, Effective Technical Communication, Tata McGraw–Hill, Publishing Company Limited, First Edition, 2005
3 *Practical English Usage* by Michael Swan, 3rd Edition, OUP
4 *Intermediate English Grammar* by Raymond Murphy, CUP
5 *Study: Reading by* Eric H .Glendinning, 2nd Edition CUP
6 *Business Correspondence and Report writing* by R.C Sharma, Tata McGrawhill

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	3	1	0	0	3

16HS1202 INTEGRAL TRANSFORMS

COURSE OUTCOMES:

At the end of the course students able to

1 gain the concepts of Laplace and inverse Laplace transforms
2 solve the ordinary differential equations with initial conditions using Laplace transforms
3 expand various algebraic, trigonometric and hyperbolic functions in Fourier series in different intervals
4 solve the various boundary value problems using Fourier transforms
5 obtain the knowledge of Z and inverse Z - transforms
6 compute the solutions of difference equations using Z - transforms

UNIT-I

Laplace Transforms (LTs)

Laplace transforms of elementary functions – Properties - Transforms of derivatives, integrals –Unit step function-Dirac delta function- Periodic function

Inverse Laplace transforms by Partial fractions – Properties - Convolution theorem – Application of Laplace transforms to ordinary differential equations of first and second order

UNIT-II

Fourier series (FS)

Euler formulae (without proof) – Expansion of functions as a Fourier series –Change of Interval – Even and odd functions – Half range series – Complex form of Fourier series

UNIT-III

Fourier Transformations (FTs)

Fourier Integral theorem (without proof) – Fourier transformations – Properties - Sine and Cosine transformations - Inverse Fourier transformations – Convolution – Parseval's Identity

UNIT-IV

Z - Transformations (ZTs)

Z – transforms of elementary functions – Properties – Shifting theorems – Initial and Final value theorems - Inverse Z – transforms by convolution and partial fractions – Applications to first and second order difference equations

TEXT BOOKS:

1 Higher Engineering Mathematics – 42nd Edition - Dr. B.S. Grewal - Khanna publications

REFERENCE BOOKS:

1 Advanced Engineering Mathematics – E. Kreyzig – 10th Edition – Wiley Publications
2 A Text Book of Engineering Mathematics – I - T.K.V. Iyengar, B. Krishna Gandhi and Others - S. Chand & Company – Revised edition 2013
3 A Text Book of Engineering Mathematics – II - T.K.V. Iyengar, B. Krishna Gandhi and Others - S. Chand & Company – Revised edition 2013
4 E.Rukmangadachari & E. Keshava Reddy ,Engineering Mathematics , Volume-I&II, 2nd Edition-Pearson publishers
5 Advanced Engineering Mathematics – RK Jain & SRK Iyengar – Revised edition – Taylor & Fransis - 2002
6 Websites: www.wolframalpha.com, www.mathforum.org, www.math.duke.edu

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	3	1	0	0	3

16HS1104 APPLIED CHEMISTRY

COURSE OUTCOMES:

At the end of the course students able to

1 To apply the knowledge of working principle of batteries in engineering areas
2 To apply the corrosion technology methods in various fields
3 To implement various water purification methods in industries
4 To describe the boiler troubles and estimations of hardness
5 To know the application and manufacture of new polymers for industrial demand
6 To know the knowledge of advanced polymer for different application
7 To finding the lubricants for engineering applications
8 To understand the processing of cementing in construction engineering

UNIT-I

ELECTROCHEMISTRY AND CORROSION SCIENCE

Conductance, Equivalent conductance, Molecular conductance, application of conductance, Conductometric Titration –acid vs. base, Electrochemical cell and its applications.Numerical calculationconductivity and electrochemical cell.

Batteries: Ni-Cad cell, Lithium Cells, Fuel Cells, Hydrogen – Oxygen fuel cell, Methanol Fuel cell.

Corrosion-definition, examples, effects- Mechanism of Dry corrosion and wet corrosion. Factor Influencing corrosion, corrosion control methods-sacrificial anode, impressed current, inhibitors, Electroplating(Ni&Cr) and Electro less plating (Cu and Ni)

UNIT-II

WATER TECHNOLOGY-I: sources and impurities of water, water treatment for drinking purpose-disinfection and concept of break –point chlorination –Desalination of brakish water-Principle and process of electro-dialysis and reverse osmosis.

WATER TECHNOLOGY-II: Boiler troubles –Scales, sludges, caustic embrittlement and boiler corrosion-causes, disadvantages and prevention, internal conditioning methods-phosphate, calgon and sodium aluminate-External treatment methods- ion-exchange methods. Estimation of Hardness, Dissolved oxygen, Alkalinity and chlorides

UNIT-III

POLYMER TECHNOLOGY: polymerization-addition, condensation. Thermoplastics and thermosetting, preparation properties and application of Bakelite, Nylon, Teflon. Synthetic rubber, Buna S, Buna N, Poly-urethane, Thiokol rubbers. Conducting polymers-examples classification intrinsically conducting polymers and extrinsically conducting polymer, doping conducting polymers. Liquid Crystals-definition, properties and classification application. Natural rubber, Vulcanization, compounding of rubber. Inorgaic polymer-Silicones

UNIT-IV

ENGINEERING MATERIALS AND FUEL TECHNOLOGY

Cement-types-Portland cement-composition, setting and hardening of Portland cement.

Lubricants: classification with examples, properties of lubricants –viscosity, flash point, fire point, cloud point, pour point.

Fuel Technology: Introduction, classification, solid fuel-Otto-Hoffmann's process, liquid fuel-Fischer-Tropsch Process. Calorific value, units of calorific value, Determination of calorific value of solid fuel by Bomb calorimeter. Numerical calculation for calculating of calorific values

TEXT BOOKS:

1 Engineering Chemistry by Jain and Jain, DhanpatRai Publishing Company, New Delhi
2 A Text book of Engineering Chemistry by S.S.Dara, S. Chand and Company Limited, New Delhi
3 Engineering Chemistry by K.N. Jayaveera,G.V.Subba Reddy, C. Ramachandraiah, McGraw Hill(Pvt), New Delhi

REFERENCE BOOKS:

1 A Text book of Engineering Chemistry by Shashi Chawla, DhanpatRai &Co (Pvt) Ltd, New Delhi
2 Text book of Engineering Chemistry, C.Parameswara Murthy, C.V. Agarwal, Andra Naidu, B.S. Publications, Hyderabad

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16CS1101 COMPUTER PROGRAMMING

COURSE OUTCOMES:

At the end of the course students able to

1 Ability to design algorithmic solution to problems
2 Acquire knowledge about the basic concept of writing a program
3 Understand the role of constants, variables, identifiers, operators, and type conversions of C Language
4 Ability to design programs Decision making and utilizing repetition
5 Ability to design modular programs using functions
6 Concept of Array and pointers dealing with memory management
7 Structures and unions through which derived data types can be formed

UNIT-I

Introduction to Computers and Programming:

Definition, Block diagram along with computer components, Characteristics & classification of computers, Types of programming languages.

Problem solving: top-down design, implementation of algorithms, Flow charts.

Introduction to C Language – History of C, features of C , General form of a C Program, character set in C, C-Tokens, Data types, Expression Evaluation, Operators and Expressions, Type Conversions, Formatted Input and Output

UNIT-II

Control Statements and Functions:

Decision Statements: If, if-else, nested if and switch Statements, Loop Control Statements - while, for, do-while Statements, Nested Loops, and Other Related Statements - break, continue, go to.

Functions: Function prototype, definition and accessing, passing arguments to a function, Library Functions, Scope of a function, Storage Classes - Auto, Register, Static, Extern, Scope rules, Type qualifiers, Recursion - Recursive functions, C Preprocessor, header files

UNIT-III

Arrays, Pointers and Strings:

Arrays: introduction, 1-Dimensional, 2-dimensional array, Declaration, Initialization and Accessing, Multidimensional Arrays.

Pointers: Introduction, Features of Pointers, Pointer Declaration, Arithmetic Operations with Pointers, Pointers and Arrays, Array of Pointers, Pointers to Pointers, Void Pointers, Memory Allocation Functions, Pointer to Functions, Command- Line Arguments.

Strings: String Basics, String Handling Functions

UNIT-IV

Structure and Union:

Structure and Union: Introduction, Features of structure, Declaration and Initialization of Structure, Structure within Structure, Array of Structures, Pointer to Structure, self referential Structures, Structures and Functions, type def and Enumerated data types, Unions, Bit fields.

Files: Introduction, Streams and file types, file operations

TEXT BOOKS:

1 Byron S Gottfried, Jitender Kumar Chabra, Programming with C, , Third Edition, McGraHill Pvt. Ltd

2 Jeri R Hanly, Elliot B. Koffman, Ashok Kamthane, A. Ananda Rao, Programming in C and data structures, Pearson Education

REFERENCE BOOKS:

1 R. G. Dromey, How to Solve it by Computer, Person Education,2008

2 B.A.Forouzan and R.F. Gilberg, C Programming & Data Structures, Third Edition, Cengage Learning,2000

3 Stephen G. Kochan,Programming in C –III Edition, Pearson Educataion,2004

4 J.A. Jones & K. Harrow ,C Programming with problem solving, Dreamtech Press

5 Harry H. Cheng,C for engineers and scientists an interpretive approach, , McGraHill International Pvt. Ltd

6 E.Balagurusamy, C Programming & Data Structures, TMH,2009

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	3	1	0	0	3

16EE1101 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OUTCOMES:

At the end of the course students able to

1 To identify the type of electrical machines for a given application
2 To know the importance induced emf due to relative motion between conductor and magnetic field
3 To know the constructional features of induction motor, dc machines and transformers
4 To study the behaviour of the diodes, transistors and to study how rectifier will gives output through the waveforms

UNIT-I

Introduction to Electrical Engineering: Electric current, potential and potential difference, electromotive force, electric power, ohm's law, basic circuit components, classification of network elements, Kirchhoff's laws, simple problems.

Network Analysis: Basic definitions, types of elements, types of sources, resistive networks, inductive networks, capacitive networks, and series parallel circuits, star delta and delta star transformation, Superposition, Thevenin's, Norton's, Maximum power transfer theorems and simple problems

UNIT-II

DC Generator: Principle of operation of dc generator, Types of DC generators, EMF equation of a dc generator, OCC of a DC Generator-simple problems.

DC Motor: Principle of operation of DC motor, Types of DC Motors, back emf, Torque equation, losses & efficiency calculation, Swinburne's test-applications

UNIT-III

Transformers: Principle of operation, Constructional Details, Ideal Transformer and Practical Transformer, EMF equation, Losses, Transformer tests- OC and SC test, efficiency and regulation calculations-simple problems.

Three phase induction motor: Construction and principle of operation, slip and rotor frequency, simple problems

UNIT-IV

Semiconductor Devices: Intrinsic semiconductors-Electron-Hole Pair Generation, Conduction in Intrinsic Semiconductors, Extrinsic Semiconductors-N-Type and P-Type Semiconductors, Comparison of N-Type and P-Type Semiconductors. Basics of semiconductors-The p-n Junction – drift and diffusion currents**,** .The p-n Junction diode-forward bias, reverse bias, Volt-Ampere characteristics- diode specifications, applications of diode, Diode as a Switch. Diode as a Rectifier-Half-wave Rectifier, Full-Wave Rectifier, Full-Wave Bridge Rectifier, Zener diode and SCR.

BJT and FET: Bipolar Junction Transistor (BJT) – Types of Transistors, Operation of NPN and PNP Transistors, Input-Output Characteristics of BJT-CB, CE and CC Configurations, Relation between I_C, I_B and I_E

TEXT BOOKS:

1 T K Nagasarkar, and M.S. Sukhija, Basic Electrical Engineering, Oxford University Press. 2nd Edition 2007
2 M.S.Naidu and S. Kamakshiah, Basic Electrical Engineering. TMH.3rd Edition 2009
3 Basic Electrical and Electronics Engineering, S.K Bhattacharya, Pearson Education, 2012

REFERENCE BOOKS:

1 D P Kothari and I.J. Nagrath, Theory and solutions of Basic Electrical Engineering. PHI.2010
2 B.L Theraja & A.K.Theraja, "A Text Book of Electrical Technology", 3rd Revised Edition, S.Chand & Company Ltd., New Delhi, 2005
3 H Cotton, "Advanced Electrical Technology", AH Wheeler & Co., 1990. Eugene C Lister, "Electric Circuits and Machines", New York, McGraw-Hill, 1975

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	0	0	3	0	2

16HS2108 APPLIED CHEMISTRY LAB

COURSE OUTCOMES:

At the end of the course students able to

1 To handle different glassware and apparatus and learn the skill in executing volumetric type experimental procedure
2 To prepare some simple polymers
3 To know the characteristics of lubricants and be able to modify lubricants according to purpose
4 To take care of pollution control measures in industry
5 To learn the desirable limits of various constituents in water analysis and its importance

LIST OF EXPERIMENTS

1 Estimation of dissolved oxygen in water samples
2 Preparation of standard EDTA solution and estimation of hardness of water
3 Corrosion of mild steel in acid and influence of an inhibiter thio urea
4 Preparation of standard potassium dichromate solution and estimation of ferrous ion
5 Determination of calorific value of solid fuel by using Bomb Calorimeter
6 Determination of strength of given strong acid and strong base solution by conductometric titrations
7 Estimation of chloride ion in water sample by Mohr's method
8 Determination of viscosity of the oil through redwood viscometer
9 Determination of alkalinity of water
10 Preparation of Phenol-Formaldehyde Resin (Bakelite)

TEXT BOOKS:

1 Quantitative Analysis by A.I. Vogel
2 Engineering Chemistry Lab Manual by K.Gouru Naidu
3 Laboratory Manual on Engineering Chemistry, S.K.Bhasin and Sudha Rani, 2nd Edition, Dhanpat Rai Publishing Company, New Delhi

REFERENCE BOOKS:

1 Text Book of Engineering Chemistry by R.N. Goyal and Harrmendra Goel
2 A Text book on experiments and calculations-Engineering Chemistry. S.S. Dara

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	0	0	3	0	2

16CS2102 COMPUTER PROGRAMMING LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Understand the basic concept of C Programming, and its different modules that include conditional and looping expressions, Arrays, Strings, Functions, Pointers, Structures and File programming.
2 Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
3 Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
4 Structures and unions through which derived data types can be formed
5 File Handling for permanent storage of data or record.

LIST OF EXPERIMENTS

Exercise-1
Programs on Expressions.
Exercise-2
Programs on decision control statements.
Exercise -3
Programs on loop statements.
Exercise -4
Programs to implement on functions.
Exercise -5
Programs to implement on parameter passing techniques.
Exercise -6
Programs using recursion.
Exercise-7
Programs using arrays.
Exercise -8
Programs to implement string handling functions.
Exercise -9
Programs to implement on pointers.
Exercise -10
Programs to implement on structures.
Exercise -11
Programs on files.
Exercise -12
Programs on command line arguments.

TEXT BOOKS:

1 Byron S Gottfried, Jitender Kumar Chabra, Programming with C, , Third Edition, McGraHill Pvt. Ltd
2 Jeri R Hanly, Elliot B. Koffman, Ashok Kamthane, A. Ananda Rao, Programming in C and data structures, Pearson Education

REFERENCE BOOKS:

1 R. G. Dromey, How to Solve it by Computer, Person Education,2008
2 B.A.Forouzan and R.F. Gilberg, C Programming & Data Structures, Third Edition, Cengage Learning,2000
3 Stephen G. Kochan,Programming in C –III Edition, Pearson Educataion,2004
4 J.A. Jones & K. Harrow ,C Programming with problem solving, Dreamtech Press
5 Harry H. Cheng,C for engineers and scientists an interpretive approach, , McGraHill International Pvt. Ltd
6 E.Balagurusamy, C Programming & Data Structures, TMH,2009

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	0	0	0	3	2

16ME2103 ENGINEERING DRAWING PRACTICE

COURSE OUTCOMES:

At the end of the course students able to

1. Convey visual perception information regarding relative locations of objects through an orthographic/isometric view
2. Analyze a drawing and bring out any inconsistencies to put forth inferences graphically
3. Create feasible designs of simple objects with drawing tools and/or free-hand
4. Get training in the transformation of the imagined data to present as drawings so that the communication skill will be increased especially in technical subjects
5. Impart the training in multi-view representations and its conversion into pictorial views and the reverse also
6. Ability to understand the different standards in technical drawing and to help in reaching future engineering positions especially in research and design
7. Generate solids and isometric projections in Auto-CAD

UNIT-I

Introduction to Engineering Drawing: Geometrical Constructions-Construction of Polygons.

Conic Sections

Ellipse: Eccentricity method, Oblong method, Parallelogram method, Arc's of Circles method and Concentric Circles method.

Parabola: Eccentricity method, Rectangle method, Tangent method, Parallelogram method.

Hyperbola: Eccentricity method, Rectangular hyperbola, Asymptotes method, two branches of Hyperbola (Arc's of Circles method), Abscissa- Ordinate- method.

Cycloids: General Cycloid, Epi -Cycloid, Hypo-Cycloid.

UNIT-II

Projections of Points, Straight Lines, Planes:

Points: Introduction to Orthographic Projections, Describing of quadrants, First and Third angle projection – Position of points in 4 quadrants.

Straight Lines: Lines parallel to both the principal planes, perpendicular to one plane and parallel to another plane, lines inclined to one plane, lines inclined to both the planes, finding true lengths, true inclinations.

Planes: Projection of regular plane surfaces, planes parallel to one plane, planes inclined to one plane and inclined to both the planes.

UNIT-III

Projection of Solids, Sections and Development of Solids with Auto -CAD

Solids: Positions of regular solids(prism, cylinder, pyramid and cone) – Projection of Solids – Axis perpendicular to one plane and parallel to another plane, inclined to one plane and inclined to both the planes, Axis parallel to both the Principal planes.

Section of Solids: Section Planes and Sectional views of Right Regular Solids–Prism, Cylinder, Pyramid and Cone. True shapes of the sections.

Development of Solids: Development of Surfaces of Right Regular Solids – Prisms, Cylinder, Pyramid, Cone and their Sectional parts.

UNIT-IV

Isometric and Orthographic Projections with AUTO-CAD

Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines.

Orthographic Projections – Conversion of pictorial views into orthographic views.

TEXT BOOKS:

1 N.D. Bhat, Engineering Drawing, Charotar Publishers, 52nd Revised and Enlarged: 2013
2 K.L. Narayana, P. Kanniah, Engineering Drawing, Publisher, Scitech

REFERENCE BOOKS:

1 Venugopal, K., A Textbook of Engineering Graphics , New age Publishers,2009
2 Venkata Reddy, Engineering Drawing, B.S.Publishers ,2009
3 Basant Agrawal, C M Agrawal ,Engineering Drawing, 2013
4 V.RameshBabu, Engineering Drawing .2009
5 www.design-technology.info/IndProd/**drawing**swww.asce.org
nptel.ac.in/courses/112103019

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16HS1302 PROBABILITY AND STSTISTICS

COURSE OUTCOMES:

At the end of the course students able to

1 gain the concepts of normal distributions estimation, and sampling distribution
2 apply the knowledge of normal and sampling distribution to various practical situations using normal tables
3 test the hypothesis of various engineering problems
4 investigate the small samples using χ^2-and *t* – tests
5 get the concept of F – test
6 analyze various industrial applications using Analysis of variance

UNIT-I

Distributions

Binomial, Poisson and normal distributions – Properties of normal distribution – Areas under normal curve – Population and Sample - Sampling distributions of means (with and without replacement)

UNIT-II

Test of Hypothesis and Large Sample Tests

Statistical Hypothesis – Tests of Significance - Null and Alternative hypotheses –Types of errors - Level of Significance – Critical values and region – One and two tailed tests – Procedure for hypothesis testing - Testing of significance of means and proportions

UNIT-III

Small samples tests

Degrees of freedom - Chi – square test - χ^2- test for goodness of fit - 2×2 contingency table - Student's *t* – distribution – testing of single mean and difference of means

UNIT-IV

F – test and ANOVA

F – test - AN0VA - One and Two – way classifications

TEXT BOOKS:

1 Fundamentals of Statistics – S. C. Gupta –Himalaya Publications (6th revised and enlarged edition)
2 Probability and statistics by Dr.T.K.V.Iyengar - S Chand &Co.-Revised edition

REFERENCE BOOKS:

1 Miller's and Freund's "Probability and Statistics for Engineers" – Johnson Richard A – 2011 Edition – Prentice Hall of India
2 Advanced Engineering Mathematics - Erwin Kreyzig – John Wiley & sons Inc. - 10th edition
3 Higher Engineering Mathematics - Dr. B.S. Grewal - Khanna Publication.(42nd edition)
4 Websites: www.wolframalpha.com www.mathforum.org www.math.duke.edu

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	3	0	0	0	3

16CS1305 INTRODUCTION TO DATA STRUCTURES

COURSE OUTCOMES:

At the end of the course students able to

1 Understand the concepts of linked list
2 Apply Concepts of Stacks, Queues
3 Develop Programs for Searching, Sorting
4 Apply the concepts of trees in Sorting

UNIT-I

Introduction to data structures, Types, Operations
Stacks: Introduction, Stack Operations, Applications.
Queues: Introduction, Operations on queues, Circular queues, Priority queues & Applications.

UNIT-II

Linked lists: Introduction, Singly linked lists, Circular linked lists, Doubly linked lists, Multiply linked lists, Applications.
Implementation of Stack and Queue using linked list.

UNIT-III

Sorting: Introduction, Selection sort, Bubble sort, Insertion sort, Merge sort, Quick sort, Heap Sort.
Searching: Introduction, Linear search, Binary search, Fibonacci search.

UNIT-IV

Trees: Introduction, Definition and basic terminologies, Representation of trees.
Binary Trees: basic terminologies and types, binary tree traversals, applications. Binary search trees.

TEXT BOOKS:

1 G.A.V PAI, Data Structures and Algorithms, Concepts, Techniques and Applications, Volume1, 1stEdition, Tata McGraw-Hill, 2008.
2 Richard F. Gilberg & Behrouz A. Forouzan, Data Structures, Pseudo code Approach with C, 2ndEdition, Cengage Learning India Edition, 2007.

REFERENCE BOOKS:

1 Langsam, M. J. Augenstein, A. M. Tanenbaum, Datastructures using C and C++, 2nd Edition, PHI Education, 2008.
2 Sartaj Sahni, Ellis Horowitz, Fundamentals of at a Structures in C, 2nd Edition, Orientblackswan, 2010.

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	3	1	0	0	3

16ME1301 MECHANICS OF SOLIDS

COURSE OUTCOMES:

At the end of the course students able to

1 Utilize knowledge of computing the stresses and strains, provide information required for further design
2 Compute relevant stresses in pressure vessels and other structural components provide preliminary analysis needed for design
3 Perform stress analysis for selected components of industrial and domestic products
4 Analyze components under complex loading conditions by simplifying under suitable assumptions
5 Draw the SF and BM diagrams for various beams under different loading conditions
6 Able to determine strength and deformation of members under various loading conditions
7 Determine the stability of the columns under different end conditions and understand the design principles
8 Learn the two dimensional stress transformation and apply it for analysis of members with combined loading

UNIT-I

Simple Stresses and Strains: Elasticity and plasticity – Types of stresses & strains – Hooke's law – stress & strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio & volumetric strain – Elastic module & the relationship between them – Bars of varying section – composite bars – Temperature stresses. Strain energy –Resilience – Gradual, sudden, impact and shock loadings. Principle stresses and strains-computation of principle stresses and strains on inclined planes-theory of failures- minimum principle stress, strain, shear stress and strain energy theories

UNIT-II

Shear Force and Bending Moment : Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, U.D.L., uniformly varying loads and combination of these loads – Point of contra flexure – Relation between S.F., B.M and rate of loading at a section of a beam.

Flexural Stresses: Theory of simple bending – Assumptions – Derivation of bending equation: M/ I = f/y = E/R Neutral axis –Determination bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I,T, Angle and Channel sections – Design of simple beam sections

UNIT-III

Shear Stresses: Introduction, Shear stress at a section (derivation of equation), Shear stress distribution for different sections (rectangular, circular, solid and hollow, I, T, angle sections.

Torsion of Circular Shafts- Theory of pure torsion- Derivation of torsion equations; $T/J=q/r=N\theta/L$ – Assumptions made in the theory of pure torsion- torsional moment of resistance- polar section modulus.

Deflection of Beams: Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, - U.D.L uniformly varying load. Mohr's theorems – Moment area method – application to simple cases including overhanging beams

UNIT-IV

Thin Cylinders: Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and volumetric strains – changes in diameter, and volume of thin cylinders – Riveted boiler shells – Thin spherical shells.

Thick Cylinders: Lame's equation – cylinders subjected to inside & outside pressure - Compound cylinders

TEXT BOOKS:

1 R. K. Bansal, Strength of materials, Lakshmi Publications, 5th Edition, 2012
2 R. K. Rajput, Strength of Materials, S. Chand and Co., New delhi.1999
3 S. S. Bhavikatti, Strength of Materials I & II, New Age Publications, 2012

REFERENCE BOOKS:

1 A. K. Tayal, "Engineering Mechanics", Umesh Publications, 2005
2 Ferdinand.L.Singer, Engineering Mechanics (Statics and Dynamics), Harper Row Publishers.2007
3 Shames.I.H, Engineering Mechanics (Statics and Dynamics), Prentice – Hall of India- New Delhi, 2004
4 Timoshenko.S.P and Young.D.H, Engineering Mechanics, McGraw Hill Book Co. Ltd.2003
5 S.Temoshenko, D.H.Young and J.V.Rao, Engineering Mechanics, Revised 4th Edition, Tata-McGraw-Hill Publishing Company Limited, New Delhi, 2007
6 Thermodynamics – J.P.Holman, McGrawHill, 2nd Edition company New York 1975
7 solidmechanics.orgnptel.ac.in/courses/112103019
8 www.mdsolids.com

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 3rd Semester – Mechanical Engg	**L**	**T**	**P**	**Oth**	**C**
	3	1	0	0	3

16ME1302 FLUID MECHANICS AND HYDRAULIC MACHINERY

COURSE OUTCOMES:

At the end of the course students able to

1. Employ the basic knowledge of hydraulics in finding fluid properties, performance parameters of hydraulic turbines and pumps
2. To study 1-D viscous and non-viscous flow through pipes. Bernoulli's equation, laminar and turbulent flow
3. Analyze hydraulic machines by developing mathematical models to study characteristics of various steady flow and performance parameters of hydraulic machinery
4. Present feasible design solutions to the construction of efficient hydraulic turbines and pumps
5. Identify the manageable areas in hydraulic machinery to reduce the mechanical losses

UNIT-I

Fluid statics:

Physical properties of fluids- specific gravity, viscosity, surface tension- vapor pressure and their influence on fluid motion- atmospheric gauge and vacuum pressure –measurement of Pressure- Piezometer, U-tube and differential manometers.

Hydro Static Forces on surfaces and submerged bodies: Total pressure, center of pressure, Hydrostatic forces on vertical, inclined and curved surfaces

UNIT-II

Fluid Kinematics and Dynamics:

Classification of flows, Stream line, path line and streak lines and stream tube, differential Equation of continuity, Acceleration. Forces acting on a Fluid in Motion; Euler's equation of motion; Bernoulli's equation; Momentum principle; Force exerted on a pipe bend.

Flow through Pipes:

Reynold's experiment- Darcy Weisbach equation- Minor losses in pipes- pipes in series and pipes in parallel- total energy line-hydraulic gradient line. Measurement of flow: pilot tube, venturimetre, and orifice meter, flow nozzle

UNIT-III

DIMENSIONAL ANALYSIS AND SIMILITUDE: Introduction, dimensions; Dimensional homogeneity; Methods of dimensional analysis- Rayleigh‟s method; Buckingham – Pi theorem; model analysis; similitude-types of similarities; Dimensionless numbers; Model laws ; Partially submerged objects; types of models; Scale effect.

BOUNDARY LAYER THEORY& DRAG AND LIFT: Boundary layer – concepts, Prandtl‟s contribution, Characteristics of boundary layer along a thin flat plate, laminar and turbulent Boundary layers, separation of BL. expression for drag and lift; Lift and Drag Coefficients; pressure drag and friction drag; Streamlined and bluff bodies

UNIT-IV

Basics of turbo machinery:

Hydrodynamic force of jets on stationary and moving flat, inclined, and curved vanes, jet striking centrally and at tip, velocity diagrams, work done and efficiency, flow over radial vanes

Principles of Hydraulic Turbines – Impulse and Reaction Turbines - Pelton Turbine – Francis Turbine – Kaplan Turbine, working principles, design principles.

Centrifugal pumps – Axial flow pumps, working principles, design principles

TEXT BOOKS:

1 Hydraulics & Fluid Mechanics by P. N. Modi & S. N. Seth; Standard Book house, New Delhi
2 Fluid Mechanics & Hydraulic Machines by Dr. R. K. Bansal; Laxmi Publications, New Delhi

REFERENCE BOOKS:

1 Hydraulic Machines by Jagdish Lal, Metropolitan
2 A. K. Jain; Fluid Mechanics, Khanna Publishers, Delhi
3 Rajput, Fluid mechanics and fluid machines, S.Chand &Co
4 D.S. Kumar Kataria, Fluid Mechanics & Fluid Power Engineering, Publishers: D.S. Kumar Kataria&Sons
5 K R Arora, Fluid Mechanics, Hydraulics and Hydraulic Machines, Standard Publishers
6 Kumar K.L., Engineering Fluid Mechanics, Eurasia Publishing House (P) Ltd., New Delhi
7 www.brighthubengineering.comwww.mdsolids.com
8 global.oup.com/ushe

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 3rd Semester – Mechanical Engg

L	T	P	Oth	C
3	1	0	0	3

16ME1303 ENGINEERING THERMODYNAMICS

COURSE OUTCOMES:

At the end of the course students able to

1. Provide the foundation for analysis of energy conversion systems
2. Employ the fundamental knowledge of conservation of mass, conservation of energy, work interaction, heat transfer and first law of thermodynamics in thermal design of equipments
3. Derive the mathematical equations for reversible and irreversible phenomena and provide analytical and numerical solutions
4. Apply the concept of second law to design simple systems
5. Assess the performance of engineering systems and processes based on laws of thermodynamics
6. Apply the concepts of entropy and energy in engineering analysis
7. Comprehend a selection of thermodynamic concepts to apply for industry related problems and analyze the problems related to psychometric process

UNIT-I

Basic Concepts: Macroscopic and Microscopic Approaches, Thermodynamic System, State, Property, Process and Cycle, Quasi Static Process, Thermodynamic Equilibrium, Quasi-static Process, Zeroth Law of Thermodynamics,

Work & Heat Transfer: Work transfer, types of work transfers, Point and Path Functions, Heat transfer, Comparison of Work and Heat transfers.

First Law of Thermodynamics: First Law applied to a process and a cycle, Energy - a property, Forms and transformation of Energy, Internal Energy and Enthalpy, PMM I.

Flow Systems: Control Volume, Steady Flow Process, Mass balance and Energy Balance, Applications of Steady Flow Processes

UNIT-II

Second Law of Thermodynamics: Heat Engine, Statements of Second law and their equivalence, Refrigeration and Heat Pump, Reversibility and Irreversibility, Carnot cycle and Carnot's Theorem, Thermodynamic Temperature Scale, Efficiency of Heat Engine, PMM II

Entropy: Clausius' Theorem, Entropy as a property, T-S Plot, Clausius Inequality, Principle of Entropy Increase and its applications. Available Energy, Quality of Energy, definitions of dead state, Availability

UNIT-III

Pure Substances: P-V, P-T, T-S diagrams of Pure Substances, Mollier Diagram, Dryness Fraction, Use of Steam Tables for Thermodynamic Properties

Thermodynamic Relations: Maxwell's equations, TDS equations, Joule-Kelvin Effect, Clausius-clapeyron equation

UNIT-IV

Properties of Gases and Gas Mixtures: Ideal Gas, Equation of State, Avogadro's Law, Internal Energy and Enthalpy of Ideal Gas, Entropy Change of Ideal Gas, Mixture of Gases-Dalton's Law of Partial Pressure , Specific Heats, Internal Energy and Enthalpy of Gas Mixtures

Gas Power Cycles: Carnot Cycle, Sterling Cycle, Ericson Cycle, Otto Cycle, Diesel Cycle, Dual Cycle, their applications, comparison of Otto, Diesel and Dual cycles, Second Law Analysis of Gas Power Cycles

TEXT BOOKS:

1 Engineering Thermodynamics, P.K Nag, TMH Publishers, New Delhi, 5th Edition, 2013
2 Thermodynamics – An Engineering Approach – YunusCengel& Boles, TMH,7th Edition 2011

REFERENCE BOOKS:

1 Engineering Thermodynamics by P. Chattopadhyam, Oxford, 1st Revised, 2011
2 Fundamentals of Thermodynamics – Sonntag, Borgnakke and van wylen, John Wiley & sons (ASIA) Pte Ltd, 7th Edition, 2009
3 Thermodynamics – J.P.Holman, McGrawHill, 2nd Edition company New York 1975
4 An introduction to Thermodynamics, YVC Rao, Universities press, 2009 Revised Edition
5 Engineering Thermodynamics – J.B. Jones & R.E.Dugan, PHI, 1st Edition, 2009
6 bookboon.com/en/applied-thermodynamics
7 youngsprinter.xyz/abc/a/applied-thermodynamics

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 3rd Semester – Mechanical Engg	L	T	P	Oth	C
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16ME1304 ENGINEERING GRAPHICS WITH AUTO CAD

COURSE OUTCOMES:

At the end of the course students able to

1. Convey visual perception information regarding relative locations of objects through an orthographic/isometric view
2. Analyze a drawing and bring out any inconsistencies to put forth inferences graphically
3. Create feasible designs of simple objects with drawing tools and/or free-hand
4. Get training in the transformation of the imagined data to present as drawings so that the communication skill will be increased especially in technical subjects
5. Impart the training in multi-view representations and its conversion into pictorial views and the reverse also
6. Ability to understand the different standards in technical drawing and to help in reaching future engineering positions especially in research and design
7. Generate solids and isometric projections in Auto-CAD

UNIT-I

Orthographic Projections – Conversion of pictorial views into orthographic views

Sections of Solids: Section Planes and Sectional views of Right Regular Solids–Prism, Cylinder

UNIT-II

Sections of Solids: Sectional views of Right Regular Solids– Pyramid and Cone. True shapes of the sections.

Development of Surfaces of Right Regular Solids – Prisms, Cylinder, Pyramid, Cone and their Sectional parts

UNIT-III

INTERPENETRATION OF RIGHT REGULAR SOLIDS: Projections of curves of Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone, Square Prism Vs Square Prism

UNIT-IV

PERSPECTIVE PROJECTIONS: Perspective View of Plane Figures and Simple Solids. Vanishing Point Method

TEXT BOOKS:

1. N.D. Bhat, Engineering Drawing, Charotar Publishers, 52nd Revised and Enlarged: 2013
2. K.L. Narayana, P. Kanniah, Engineering Drawing, Publisher, Scitech

REFERENCE BOOKS:

1 Venugopal, K., A Textbook of Engineering Graphics , New age Publishers,2009
2 Venkata Reddy, Engineering Drawing, B.S.Publishers ,2009
3 Basant Agrawal, C M Agrawal ,Engineering Drawing, 2013
4 V.Ramesh Babu, Engineering Drawing .2009
5 www.design-technology.info/IndProd/**drawing**swww.asce.org
6 nptel.ac.in/courses/112103019

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR
(AUTONOMOUS)

B.Tech 3rd Semester – Mechanical Engg

L	T	P	Oth	C
0	0	3	0	2

16ME2305 MATERIAL TESTING LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Perform tensile, shear, and torsion tests on test specimens in a real - life situation
2 Analyze the experimental results and compute Young's modulus for a material using appropriate test procedure
3 Ability to perform different destructive testing
4 Ability to characteristic materials

LIST OF EXPERIMENTS

1 Tension test
2 Bending test on simple support beam
3 Bending test on continuous beam
4 Torsion test
5 Hardness test
6 Spring test
7 Compression test on wood or concrete
8 Impact test
9 Shear test
10 Verification of Maxwell’s Reciprocal theorem on beams
11 Use of electrical resistance strain gauges
12 Continuous beam – deflection test

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 3rd Semester – Mechanical Engg

L	T	P	Oth	C
0	0	3	0	2

16ME2306 FLUID MECHANICS AND HYDRAULIC MACHINERY LAB

COURSE OUTCOMES:

At the end of the course students able to

1. Use various flow measurement instruments
2. Calculate the losses and discharge in pipes and conduct performance tests on pumps and turbines to find the efficiency
3. Demonstrate systematic approach in conducting experiments
4. Prepare reports on the data collected and draw inferences

LIST OF EXPERIMENTS

1. Venturimetre: Determination of Coefficient of discharge
2. Orifice meter: Determination of Coefficient of discharge
3. Determination of friction factor of Pipes
4. Determination of loss of head in pipes due to bends, sudden contractions and sudden expansion
5. Verification of Bernoulli's equation
6. Impact of jet on vanes
7. Performance test on Pelton wheel turbine
8. Performance test on Francis turbine
9. Performance test on Kaplan turbine
10. Performance test on single stage centrifugal pump
11. Performance test on multi stage centrifugal pump
12. Performance test on reciprocating pump

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 3rd Semester – Mechanical Engg

L	T	P	Oth	C
0	0	3	0	2

16EE2307 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Verify network theorems for different electrical circuits
2 Test D.C Machines using different techniques
3 To select suitable DC machine for domestic and industrial applications
4 To demonstrate knowledge on construction and operation of various DC machines, starting and speed control of DC motors
5 To analyse different types of electronic devices performance and their characteristics

LIST OF EXPERIMENTS

PART-A (ELECTRICAL LAB)

1 Verification of Superposition theorem
2 Verification of Thevenin`s and Norton`s Equivalent circuits and Verification by direct Test
3 Magnetization characteristics of DC Shunt Generator
4 Swinburne`s Test on DC Shunt machine
5 Brake Test on DC Shunt Motor
6 OC and SC Test on single phase Transformer

PART-B (ELECTRONICS LAB)

1 Identification, Specifications and Testing of R, L, C components (color codes),Potentiometers, Switches (SPDT, DPDT and DIP), Coils, Gang Condensers, Relays, Bread Boards, Identification and Specifications of active devices, Diodes, BJTs, Low power JFETs, MOSFETs, LEDs, LCDs, SCR, UJT, Linear and Digital ICs
2 PN Junction Diode Characteristics (Forward bias, Reverse bias)
3 Zener Diode Characteristics and Zener as regulator
4 Transistor CE Characteristics (Input and Output)
5 Rectifier with and without Filters (Full wave)
6 Characteristics of SCR

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 3rd Semester – Mechanical Engg	**L**	**T**	**P**	**Oth**	**C**
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16AS3301 COMMUNICATION SKILLS PRACTICE

COURSE OUTCOMES:

At the end of the course students able to

1 In this strand, students develop learning and thinking skills and strategies to become self-directed, lifelong learners
2 They discover how to manage their own learning and acquire knowledge and skills that they can transfer to a variety of situations related to learning, work, and daily life

- **Development of Proficiency in Concepts of effective communication:**

Practice on Oral and spoken communication skill & testing– Communication process and voice & accent, voice clarity, handling them voice modulation & intonation,
KISS (Keep it short and sweet) in word stress etc.
Composing Feedback and questioning effective messages.
Non–Verbal Communication: Objectiveness in Argument its importance and nuances:
Development etiquettes and Facial Expression,
Posture, manners Gesture , Eye contact, appearance Study of different pictorial (dress code).

- **Art of Speaking**

Introduction – What makes communication important? – Defining communication – special feature of communication – communication process – channels of communication – Formal communications network – Informal communications network (Grapevine Communication) – Importance of Communication – Barriers to communication – Tips for effective communication – conversation tips – what is presentation? – Tips for powerful presentation – Art of public speaking – Importance of public speaking – Benefits of public speaking – Public speaking tips – overcoming fear of public speaking.

Activity : Conservation; Presentation; Pubic Speaking

- **Art of Writing**

Introduction – Importance of Writing – Writing tips – Drawbacks of written communications.

- **Art of Writing E-Mail**

Introduction – The Mail Magic – use appropriate salutations – Make the subject matter significant – keep a dictionary close by – use commas – use smileys – when I doubt, preface – include previous message – shorten the file attachments – Reread before pressing 'Send' button – Be polite, and reciprocate good deeds – Anticipate, empathize, understand – what netiquette?

- **Etiquette and Manners**

Etiquette

Introduction – Modern etiquette – Benefits of etiquette – classification of etiquette – accompanying women – Taboo topics – proposing the toast.

Manners

Introduction – Poor Manners noticed in youth – why should you practice good manners ? – Practicing good manners – Manners at the wheel driving – Manners in the flight – Respecting the sacred – visiting holy places – Dealing with the challenged – Attending the funeral – Professional

manners – social skills (manners) – getting along with people – Manners to get respect from others – To sum up : corporate grooming tips – Mind your mobile manners – Annoying office habits.

Activity : 1. Test your Etiquette; 2. Test your Manners

- **Preparing CV / Resume**

Introduction – Meaning – Differences among Bio-data, CV and Resume – The terms – The purpose of CV writing – Types of Resumes – Interesting facts about Resumes – CV writing tips – CV/Resume preparation – the do's – Resume checkup – Electronic Resume tips – References – Power words – Common Resume builders – Key skills that can be mentioned in the Resume – Cover letters – Cover letter tips

Expression of non-verbal communication and its analysis

- **Written Communication Skill**:
  Practice for:
  - Correction of errors
  - Making of Sentences
  - Paragraph Writing
  - Leave Application and simple letter writing

- **Presentation Skill practice**
  - Preparing in presentation
  - Delivery of presentation
- **Telecommunication Skills**
  - Tele – etiquette
  - Receiving Calls
  - Transferring calls
  - Taking Message/ Voice Mails
  - Making Outgoing Calls
- **Computer and Internet operational**
  - Key boarding skills
  - Practice on computer using MS office XP
  - Practice on sending & receiving e-mail

REFERENCE BOOKS:

1 Soft skills Training – A workbook to develop ski lls for employment by Fredrick H. Wentz

2 Personality Development and Soft skills, Oxford University Press by Barun K. Mitra 3. The Time Trap : the Classic book on Time Management by R. Alec Mackenzine

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 3rd Semester – Mechanical Engg	**L**	**T**	**P**	**Oth**	**C**
	0	0	0	3	1

16AS3302 PROFESSIONAL SOCIETY ACTIVITIES-I

Professional Society Activities (PSA) course is aimed at enhancing the self learning, communication, managerial skills of the students by engaging them in various Co & Extra Curricular activities activities during their course of study. Activities in each of the department shall be designed and conducted by the Professional Society Executive Committee whose composition is:

1. Faculty Mentors- 2 No.
2. Student Chairman: 1 No.- Final year Student
3. Student General Secretary: 1 No.- Third year Student
4. Treasurer: 1 No.- Third year Student

Student Members: 2 No.s from each class

PSA related activities would be of the following nature but not limited to:

Activity#0 : Constitution of Student Body at respective departments & Inaugural Function

Activity#1 : Just A Minute

Activity#2 : Technical Quiz

Activity#3 : Open House- Lab Demo

Activity#4 : Technical Paper Presentation- Preliminary

Activity#5 : Technical Paper Presentation- Final

Activity#6 : Poster Presentation

Activity#7 : Collage- A theme based event

Activity#8 : Debate Competition

Activity#9 : Group Discussion Competition

Activity#10 : Mock Interviews

Activity#11 : Model Exhibition

Activity#12 : Valedictory Function

Composition of Professional Society Executive Committee:

1. Faculty Mentors- 2 No.
2. Student Chairman: 1 No.- Final year Student
3. Student General Secretary: 1 No.- Third year Student
4. Treasurer: 1 No.- Third year Student
5. Student Members: 2 No.s from each class

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 4th Semester – Mechanical Engg	L	T	P	Oth	C
	3	0	0	0	3

16HS1401 MATRICES AND NUMERICAL METHODS

COURSE OUTCOMES:

At the end of the course students able to

1. compute the rank of matrices ; solve the linear system of equations (homogeneous as well as non – homogeneous)
2. calculate the eigen values and eigenvectors of the matrices ; understand the complex matrix properties
3. solve problems using Cayley – Hamilton theorem ; reduce the given matrices into diagonal form ; reduce the matrices into canonical form by orthogonal transformation
4. solve exercises by N-R method ; get to know the concept of finite differences and apply to various engineering problems
5. analyze problems using Trapezoidal and Simpson's 1/3 rules ; solve first order ODEs using Euler's and R- K methods of 2^{nd} and 4^{th} order
6. gain the knowledge of vector differentiation and solve the problems of various engineering problems

UNIT I

Matrices

Rank by Echelon and normal forms – Solution of system of linear equations – Eigenvalues and Eigenvectors - Cayley- Hamilton theorem (without proof) and its applications - Reduction to diagonal form – Quadratic forms – Reduction of Quadratic form to canonical form by orthogonal transformation and their nature

UNIT-II

Solutions of algebraic and transcendental equations

Solutions of algebraic and transcendental equations by Bisection, Regula – Falsi and Newton – Raphson Method - System of linear equations – Gauss elimination - LU decomposition Gauss – Seidel Iteration Method

UNIT-III

INTERPOLATION & CURVE FITTING

Newton's forward and backward interpolation formulae - Relations between difference operators – Lagrange's interpolation

Least squares curve fitting –fitting a straight line –non-linear curve fitting –Parabolic, Exponential and power function

UNIT-IV

Numerical Differentiation & Integration and Differential Equations

Formulae for derivatives - Numerical integration using Trapezoidal and Simpson's 1/3 rules - Numerical solutions of first order ODEs – Euler's, Runge - Kutta methods of 2^{nd} and 4^{th} orders – Milne's Predictor – Corrector Method

TEXT BOOKS:

1 Higher Engineering Mathematics, Dr. B.S. Grewal – 42^{nd} Edition - Khanna Publications
2 E. Rukmangadachari & E. Keshava Reddy ,Engineering Mathematics , Volume - I & II, 2^{nd} Edition-Pearson publishers

REFERENCE BOOKS:

1 Introduction to Numerical Analysis – S. S. Sastry – Prentice Hall of India
2 Advanced Engineering Mathematics – E. Kreyzig – 10^{th} Edition – Wiley Publications
3 A Text Book of Engineering Mathematics – I - T.K.V. Iyengar, B. Krishna Gandhi and Others - S. Chand & Company – Revised edition 2013
4 A Text Book of Engineering Mathematics, B.V. Ramana - Tata McGraw Hill Publications
5 Websites: www.wolframalpha.com www.mathforum.org www.math.duke.edu

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 4th Semester – Mechanical Engg	L	T	P	Oth	C
	3	1	0	0	3

16ME1401 MATERIAL SCIENCE

COURSE OUTCOMES:

At the end of the course students able to

1 Identify structures and properties of different materials
2 Analyze and understand the heat treatment process, equilibrium diagrams of different materials
3 Understand the principles of materials science and metallurgy and to use them for practical applications like alloying, casting, heat treatment etc
4 Train the students to apply fundamental knowledge of basic science for selection and processing of material for engineering applications
5 Expose the students to various equipment and experimental techniques used in the field of material science and metallurgy
6 Analyze recent developments taking place in the field of material science and metallurgy

UNIT-I

Structure of Metals: Bonds in Solids – Metallic bond - crystallization of metals, grain and grain boundaries, effect of grain boundaries on the properties of metal / alloys – determination of grain size.

Constitution of Alloys: Necessity of alloying, types of solid solutions, Hume Rotherys rules, intermediate alloy phases, and electron compounds.

Equilibrium of Diagrams : Experimental methods of construction of equilibrium diagrams, Isomorphous alloy systems, equilibrium cooling and heating of alloys, Lever rule, coring miscibility gaps, eutectic systems, congruent melting intermediate phases, peritectic reaction. Transformations in the solid state – allotropy, eutectoid, peritectoid reactions, phase rule, relationship between equilibrium diagrams and properties of alloys. Study of important binary phase diagrams of Cu-Ni and Fe-Fe3C

UNIT-II

Cast Irons and Steels: Structure and properties of Different cast irons. Classification of steels, structure and properties of plain carbon steels, Low alloy steels, Hadfield manganese steels, tool and die steels.

Non-ferrous Metals and Alloys: Structure and properties of copper and its alloys, Aluminum and its alloys, Titanium and its alloys

UNIT-III

Heat treatment of Alloys: Effect of alloying elements on Fe-Fe3C system, Annealing, normalizing, Hardening, TTT diagrams, tempering , Harden ability, surface - hardening methods, Age hardening treatment, Cryogenic treatment of alloys

UNIT-IV

Ceramic Materials: Crystalline ceramics, glasses, cremates, abrasive materials, nanomaterials –definition, properties and applications of the above.

Composite Materials: Classification of composites, various types of metal matrix composites. Particle – reinforced materials, fiber reinforced materials, metal ceramic mixtures, metal – matrix composites and C – C composites. Polymer Composites

TEXT BOOKS:

1 Introduction to Physical Metallurgy / Sidney H. Avener
2 Essential of Materials science and engineering/ Donald R.Askeland/Thomson

REFERENCE BOOKS:

1 Material Science and Metallurgy/kodgire
2 Science of Engineering Materials / Agarwal
3 Materials Science and engineering / William and collister
4 Elements of Material science / V. Rahghavan
5 An introduction to material science / W.g.vinas & HL Mancini
6 Material science & material / C.D.Yesudian & Harris Samuel
7 Engineering Materials and Their Applications – R. A Flinn and P K Trojan / Jaico Books
8 Engineering materials and metallurgy/R.K.Rajput/ S.Chand
9 https://dmse.mit.edu/https://books.google.co.in/books
10 guides.lib.udel.edu

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 4th Semester – Mechanical Engg	L	T	P	Oth	C
	3	1	0	0	3

16ME1402 MANFACTURING TECHNOLOGY

COURSE OUTCOMES:

At the end of the course students able to

1 Recommend appropriate part manufacturing processes when provided a set of functional requirements and product development constraints
2 Recognize a Manufacturing method suitable for particular product
3 Learn about advanced casting techniques
4 Analyze, evaluate and to understand the problems while practicing manufacturing techniques
5 Understand the basic operations and metallurgical processes in soldering and brazing
6 Understand applications of welding, casting in industries
7 Communicate effectively with industry personnel by developing a manufacturing-centric vocabulary
8 Ascertain product and process quality levels through the use of precision measurement tools and statistical quality control charts

UNIT-I

Casting: Definition, elements, Steps involved in making a casting– Types of patterns, Pattern making, Materials used for patterns, pattern allowances, Gating Systems and Risering, Cavities. Design of core prints, buoyancy principle. Moulds: materials, types of moulds, methods, moulding machines, tests. Solidification of casting, Solidification of pure metal and alloys, short & long freezing range alloys

UNIT-II

Special Casting Processes: Process Mechanics, characteristics, parameters and applications of Centrifugal, Die, and Investment casting. Risers – Types, function and design, casting design considerations, Design of feeding systems, moulding flasks, Melting Methods

UNIT-III

Arc Welding: Classification of welding processes, types of welds and welded joints and their Characteristics, Heat affected zones in welding, Design of welded joints, Arc Welding-(Shielded metal arc welding, submerged arc welding, TIG welding, MIG welding, Stud welding, Electro slag welding), Simple problems related to Arc Welding

UNIT-IV

Gas Welding: Induction Welding, Explosive Welding, Forge welding, Résistance Welding, Ultra sonic welding, Friction Welding, Thermit welding and Plasma (Air and water) welding, Oxy – Acetylene Gas cutting, water plasma. Cutting of ferrous, nonferrous metals, Electron Beam, Laser Beam Welding, Soldering & Brazing and adhesive bonding.

Mechanics: Process parameters, Simple problems on Gas Welding and Resistance Welding. Welding defects – causes and remedies – destructive and nondestructive testing of welds

TEXT BOOKS:

1 Manufacturing Technology, Vol. I P.N. Rao, Tata McGraw Hill, 4th Edition, 2013
2 Manufacturing Technology, Kalpakjain, Pearson education, 4th Edition, 2002

REFERENCE BOOKS:

1 Production Technology, K.L Narayana, I.K. International Pub, 3rd Edition,2013
2 Manufacturing Process Vol. I, H.S.Shah Pearson, 2013
3 Principles of Metal Castings, Rosenthal, Tata McGraw Hill, 2nd Edition, 2001
4 Welding Process, Par mar
5 Manufacturing Technology, R.K. Rajput, Laxmi Pub, 1st Edition, 2007
6 Workshop Technology – B.S.RaghuVamshi – Vol I
7 www.amtonline.orgwww.mechanical.in/kinematics-of-machinery
8 www.the-mtc.org

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 4th Semester – Mechanical Engg	L	T	P	Oth	C
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16ME1403 INTERNAL COMBUSTION ENGINES

COURSE OUTCOMES:

At the end of the course students able to

1 Employ the basic knowledge of an engine and compressor in developing the analytical models
2 Analyze the parameters useful to increase the performance and reducing the knock in spark ignition and compression ignition engines
3 Design solutions for better carburetion, fuel injection, ignition and lubrication
4 List design considerations favorable for minimizing harmful emissions and maximizing the power output

UNIT-I

I.C. Engines: Definition of Engine and Heat Engine, I.C Engine Classification – Parts of I.C.Engines, Working of I.C. Engines, Two Stroke & Four Stroke I.C.Engines S.I and C.I Engines, Valve and Port Timing Diagrams.

Engine System: Fuel Supply Systems, simple carburetor, Fuel Injection Systems. Cooling Systems Lubrication Systems. Ignition System

UNIT-II

Combustion in S.I. Engines : Normal Combustion and abnormal combustion – Importance of flame speed and effect of engine variables – Type of Abnormal combustion, pre-ignition and knocking (explanation of) – Fuel requirements and fuel rating, anti knock additives – combustion chamber – requirements, types

Combustion in C.I. Engines: Four stages of combustion – Delay period and its importance– Effect of engine variables – Diesel Knock– Need for air movement, suction, compression and combustion induced turbulence – open and divided combustion chambers and nozzles used – fuel requirements and fuel rating

UNIT-III

Testing and Performance: Parameters of Performance - Measurement of Cylinder Pressure, Fuel Consumption, Air Intake, Exhaust Gas Composition, and Brake Power – Determination of Frictional Losses and Indicated Power – Performance Test – Heat Balance Sheet- Sankey diagram and pie diagram

UNIT-IV

Modern Developments: Wankel engine. Stratified charge engine. Dual-fuel engines. HCCI-concept.

Engine Emissions: SI and CI engine emissions. Harmful effects. Emissions measurement methods. Methods for controlling emissions EURO and BHARAT emission norms.

Alternate Fuels for IC Engines: Need for use of alternate fuels. Use of alcohol fuels. Biodiesel. Biogas and Hydrogen in engines

TEXT BOOKS:

1 Internal Combustion Engines / V. Ganesan- TMH, 4th Edition,2012
2 Thermal Engineering / Rajput / Lakshmi Publications, 9th Edition,2013

REFERENCE BOOKS:

1 IC Engines – Mathur& Sharma – DhanpathRai& Sons, ,2010
2 Engineering fundamentals of IC Engines – Pulkrabek, Pearson, PHI, 2nd Edition,2009
3 Thermal Engineering, Rudramoorthy – TMH, 10th Edition,2010
4 Thermodynamics & Heat Engines, B. Yadav, Central publishing house., Allahabad, 2002
5 I.C. Engines fundamentals, Heywood, McGrawHIll, 1st Edition,2011
6 Thermal Engineering – R.S. Khurmi & J.K.Gupta – S.Chand, 15th Edition,2012
7 www.thermaleng.com.auwww.mccormick.northwestern.edu
8 www.elsevier.com/journals

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16ME1404 KINEMATICS OF MACHINERY

COURSE OUTCOMES:

At the end of the course students able to

1 Familiarize the motion of mechanism- to define a mechanism and to do kinematic construction for variety of mechanism used in application
2 Introduce basic mechanisms such as slider-crank linkages, four-bar linkage, gear and cam, perform the motion analysis using both graphical and analytical methods
3 Apply the knowledge gained in the earlier course engineering mechanics to a system of rigid bodies which are interconnected with constraints
4 Identify various mechanisms and choose one best suited for a given situation
5 Analyze a given mechanism and find motion characteristics using mathematical models
6 Design mechanisms to suit given requirements in select situations
7 Trouble-shoot problems associated with simple machine components such as cams, gears, gear trains, belt and chain drives
8 Introduce the concept of synthesis of mechanisms, which helps in the understanding of design

UNIT-I

Mechanisms and Machines: Elements or Links – Classification, Types of kinematic pairs, constrained motion – completely, partially or successfully constrained and incompletely constrained. Classification of mechanisms and machines – kinematic chain – inversion of mechanisms – inversions of quadric cycle chain – single and double slider crank chain, Mobility of mechanisms., Straight Line Motion Mechanisms- Exact and approximate, Pantograph

UNIT-II

Belt, Rope and Chain Drives : Belt and rope drives, selection of belt drive- types of belt drives, velocity ratio of belt drives, slip of belt, creep of belt, tensions for flat belt drive, angle of contact, centrifugal tension, maximum tension of belt, Chains- length, angular speed ratio, classification of chains.

Gears: Higher pairs, friction wheels and toothed gears – types – law of gearing, condition for constant velocity ratio for transmission of motion, Forms of tooth- cycloidal and involutes. Profiles- Velocity of sliding – phenomena of interference – Methods to avoid interference. Condition for minimum number of teeth to avoid interference, expressions for arc of contact and path of contact. Helical, Bevel and worm gearing (basics)

UNIT-III

Kinematics: Velocity and Acceleration Diagrams- Velocity and acceleration – Motion of link in machine –Determination of Velocity and acceleration – Graphical method – Application of

relative velocity method – Slider crank mechanism, four bar mechanism. Acceleration diagrams for simple mechanisms, Coriolis acceleration, and determination of Coriolis component of acceleration.Kleins construction. Analysis of slider crank mechanism for displacement, velocity and acceleration of slider using analytical method Instantaneous Centre Method: Instantaneous centre of rotation, centrode and axode – relative motion between two bodies – Three centers in-line theorem

UNIT-IV

Gear Trains: Introduction –Types of gears – Simple, compound, reverted and Epicycle gear trains. Train value – Methods of finding train value or velocity ratio – Tabular column method for Epicycle gear trains. Torque in epicycle gear trains. Differential gear of an automobile.

Cams: Definitions of cam and follower – uses – Types of followers and cams – Terminology. Types of follower motion - Uniform velocity – Simple harmonic motion and uniform acceleration. Maximum velocity and maximum acceleration during outward and return strokes. Drawing of cam profiles

TEXT BOOKS:

1 Theory of Machines, S.S. Rattan, Tata McGraw Hill Publishers, 3rd Edition, 2013
2 Kinematics and dynamics of machinery, R.L Norton, Tata McGraw Hill Publishers, 1st Edition, 2009

REFERENCE BOOKS:

1 Theory of Machines and Mechanisms, 3rd Edition, J.E. Shiegley et., Oxford International Student Edition
2 Theory of Machines, Thomas Bevan, Pearson (P) 3rd Edition, 2012
3 nptel.ac.in/courses/112104121/1www.elsevier.com/journals
4 www.mechanical.in/**kinematics-of-machinery**

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B.Tech 4th Semester – Mechanical Engg	L	T	P	Oth	C
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16ME1405 MACHINE DRAWING

COURSE OUTCOMES:

At the end of the course students able to

1 An Ability to understand and apply the knowledge of machine drawing as a system of Communication in which ideas are expressed clearly and all information fully conveyed.
2 An Ability to understand the design a system, component or process to meet desired needs within, realistic constraints such as manufacturability, economic, environmental, safety & sustainability etc.., to represent a part drawing and assembly drawings.
3 An ability to identify, formulates, analyzes and solves Engineering Problems in Optimum time
4 Recognize to use modern engineering tools, software and equipment to analyze different drawings for Design & manufacturing
5 An ability to use the techniques, skills and modern engineering tools necessary for engineering practice with the concept of virtual work
6 Recognition of the need for, and an ability to engage in self education and life-long learning

UNIT-I

Machine Drawing Conventions: Need for drawing conventions- introduction to IS conventions. Conventional representation of material, common machine elements and parts such as screws, nuts, bolts, keys, gears, webs, ribs. Parts not usually sectioned. Methods of dimensioning, general rules for sizes and placement of dimensions for holes,

Centers curved and tapered features. Title boxes, their size, location and details-common abbreviations & their liberal usage

UNIT-II

Drawing of Machine Elements and simple parts: Selection of Views, additional views for the following machine elements and parts with drawing proportions: Popular forms of Screw threads, bolts, nuts, stud bolts, tap bolts, set screws, Keys, cottered joints and knuckle joint.

UNIT-III

Riveted joints for plates flanged &protected flanged joint. Shaft coupling, spigot and socket pipe joint. Journal and foot step bearings.

UNIT-IV

Assembly Drawings: Drawings of assembled views for the part drawings of the following.

Engine parts- stuffing boxes, cross heads, Eccentrics, Petrol Engine-connecting rod, piston

assembly. Other machine parts- Screw jack, Machine Vice, single tool post.
Valves: Steam stop valve, feed check valve. Non return valve.

TEXT BOOKS:

1 Machine Drawing- K.L. Narayana, P.Kannaiah & K.Venkata Reddy, New Age Publishers, 4th Edition, 2012
2 Machine Drawing- Dhawan, S.Chand Publications, 1st Revised Edition, 1998

REFERENCE BOOKS:

1 Machine Drawing- P.S. Gill, S.K. Kataria & Sons, 17th Edition, 2012
2 Machine Drawing- Luzzader, PHI Publishers, 11th Edition
3 Machine Drawing – Raj put, S. Chand Pub
4 Textbook of Machine Drawing-K.C.Johns, 2009, PHI learning, 1st Edition

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B.Tech 4th Semester – Mechanical Engg

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16ME2406 MATERIAL SCIENCE LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Prepare Metallographic samples for microscopic examinations
2 Analyze the microstructure and estimate the amount of porosity and grain size of the casted specimen.
3 Apply the knowledge of phase diagrams and testing methods to suit design specification in related areas

LIST OF EXPERIMENTS

1 Preparation and study of the Micro Structure of pure metals like Iron, Cu and Al
2 Preparation and study of the Microstructure of Mild steels, low carbon steels, high – C Steels
3 Study of the Micro Structures of Cast Irons
4 Study of the Micro Structures of Non-Ferrous alloys
5 Study of the Micro structures of Heat treated steels
6 Hardeneability of steels by Jominy End Quench Test
7 To find out the hardness of various treated and untreated steels

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16ME2407 MANUFACTURING TECHNOLOGY LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Identify suitable method for production of simple parts
2 Analyze the different stages of production and evaluate problems while in welding, moulding, and press working operations
3 Apply these operations as per industry requirements
4 Become familiar with various manufacturing processes
5 Become familiar with usage of various manufacturing instruments
6 Become familiar with various operations
7 Use instruments with safety precautions

Trades for Exercises

A Pattern Design and Making

1 Single Piece Pattern
2 Split Piece Pattern

B Sand Properties Testing

1 Sieve Analysis
2 Permeability and strength tests

C Gas Welding

1 TIG Welding
2 Spot Welding

D Plastic Moulding:

1 Injection Moulding
2 Blow Moulding

E Press Working Operations

1 Blanking
2 Cup drawing

REFERENCE BOOKS:

1 Engineering Work shop practice, V. Ramesh Babu, VRB Publishers Private Limited, 2009
2 Work shop Manual, P.Kannaiah and K.L.Narayana, SciTech Publishers, 2009
3 Workshop Practice Manual, K. Venkata Reddy, BS Publications

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16ME2408 INTERNAL COMBUSTION ENGINES LAB

COURSE OUTCOMES:

At the end of the course students able to

1. Employ the practical knowledge in finding performance of 2-stroke, 4- stroke I.C engines and multi stage reciprocating compressor
2. Analyze the variations of engine performance parameters and changes in compression ratio on load
3. Provide solutions to low cost and high power automobile engines
4. Identify the manageable areas in an I.C engine to reduce heat losses and emissions of COx, NOx and Sox
5. Hands on experience on engines and blowers
6. Familiarize the students to automobile component
7. Motivate students for innovation in automobile field

LIST OF EXPERIMENTS

1. Determination of Viscosity – Saybolt Viscometer
2. Calorific value determination by Bomb Calorimeter
3. Calorific value determination by Junker's gas calorimeter
4. Cloud point and Pour point Apparatus
5. Valve Timing Diagram of Four Stroke CI Engine
6. Port Timing Diagram of Two Stroke SI Engine
7. I.C. Engines Performance Test (4 -Stroke Diesel Engines)
8. To find the Engine Performance Characteristics by applying different loads on 2-Stroke SI Engine
9. Study of Boilers
10. I.C.Engines Air/Fuel Ratio and Volumetric Efficiency

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16AS3401 **TECHNICAL SEMINAR**

A Technical Seminar shall have two components, one chosen by the student from the course work as an extension and approved by the faculty supervisor. The other component is suggested by the supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work. A hard copy of the information on seminar topic in the form of a report is to be submitted for evaluation along with presentation. The presentation of the seminar topics shall be made before a committee consisting of Head of the department, seminar supervisor and a senior faculty member. Each Technical Seminar shall be evaluated for 100 marks. Technical Seminar component-I for 50 marks and component-II for 50 marks making total 100 marks. (**Distribution of marks for 50:** 10 marks for report, 10 marks for subject content, 20 marks for presentation and 10 marks for queries).

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16AS3402 SOFT SKILLS PRACTICE

COURSE OUTCOMES:

At the end of the course students able to

1 Receive the support they need to resolve issues and make decisions
2 Explore their personal resources and aptitudes
3 Understand new career prospects and strive for personal development
4 Make a proper and informed decision for their career

1. Introduction - What are Soft Skills?

Importance of Soft Skills – Selling your soft skills – Attributes regarded as Soft Skills – Soft skills – Social soft skills – Thinking soft skills – Negotiating – Exhibiting your soft skills – Identifying your soft skills – improving your soft skills – will formal training enhance your soft skills – soft skills training – Train yourself – practicing soft skill – Measuring Attitude.

Activity: Measure your Soft Skill.

2. Know Thyself / Self – Discovery

Introduction – Importance of knowing yourself – Process of knowing yourself – SWOT analysis – Benefits of SWOT analysis – using of SWOT analysis – SWOT analysis grid – Questions to complete the grid.

Activity: Know yourself.

3. Developing Positive Attitude

Introduction – Meaning – Features of Attitude – Attitude and behavior – Formation of attitudes – change of attitudes – what can you do to change attitude ? Ways of changing attitude in a person – Attitude in a work place – The power of positive attitude – Developing positive attitude – Obstacles in developing positive attitude – Staying positive – Examples of positive attitude – positive attitude and its result – staying negative – examples of negative attitude – Overcoming negative attitude – Negative attitude and its results.

Activity: Measure your attitude.

4. Forming Values

Introduction – Meaning – What is a value? – A core of Values – Values relating to educations – Values relating to self and others – Values relating to Civic responsibilities – Values and attitudes – Importance of values – Formation of values – Types of Values – Terminal and

Instrumental Values – Power of Values – Personal Values – Cultural Values – Values – some examples.

Activity: Identity your values.

5. Improving Perceptions

Introduction – Meaning – Factors influencing Perception – Perceptual process – Improving perception – Perception and its application in organizations.

Activity: Test your Perception.

6. Career Planning

Introduction – Benefits of career planning – Guidelines for choosing a career – Myths about choosing a career – Tips for successful career planning – Developing career goals – Final thoughts on career planning – Things one should know while starting career and during his career.

Activity: Test your career interests.

7. Art of Listening

Introduction –What is Listening? – Two ears, one mouth – Benefits of active listening – kinds of listening – Factors that hamper listening – Common poor listening habits – Advantages of active listening – Listening tips.

Activity: Test your listening skills.

8. Art of Reading

Introduction – Reading is a Cognitive process – Good readers are what they read – Benefits of reading – Different types of reading – Tips for effective reading – The SQ3R Technique – Different stages of reading – Rates of reading – Determining a students' reading rate – Adjusting reading rate – Activities for increasing reading rate – Problems with reading – Becoming an effective reader.

Activity: Test your reading skills.

9. Body Language

Introduction – Body talk – Voluntary and involuntary body language – Forms of body language – Parts of body language – Origin of body language in building interpersonal relations – Reasons to study body language – Body language in building industrial relations – Improving body language – Types of body language – Gender differences – Female interest and body language – shaking hands with Women – Interpreting body language – Developing confidence with correct body language.

10. Team Building and Teamwork

Introduction – Meaning – Aspects of Team building – Skills needed for Team work – A model of team building – Team vs Group – Characterizer of effective team – Role of a team leader – nine persons a successful team should have – inter – group collaboration – Advantages of Inter-group collaboration – Differences faced in intergroup collaboration.

Activity: Test your team work skills.

11. Group Discussion

Introduction – Meaning of GD – Why Group Discussion – Charaters tested in a GD – Tips of GD – skills required in a GD – consequences of GD – Behaviour in a GD – Essential elements of GD – Traits tested in a GD – GD etiquette – Areas to be concentrated while preparing for a GD – Initiating a GD – Non-verbal communication in GD – Movement and Gestures to be avoided in a GD – Topics for GD.

Activity: Group Discussion.

12. Interview Skills

Introduction – Why an interview – Type of interview – Interview panel – Types of Questions asked – Reason for selecting a candidate – Reasons for selecting a candidate – Reasons for rejecting a candidate – on the day of interview – on to the interview table – attending job fair – common mistakes that you wouldn't want to do – question the candidate should not ask during the interview – pot interview etiquette – How does one follow-up? – Telephonic interview – Dress code at interview – Typical questions asked – Interview mistakes – quick tips – How to present well in interview – Tips to make a good impression in an interview – Job interview – Basic tips – How to search for job effectively – Interview quotations.

13. Time Management

Introduction – The 80:20 rule – Take a good look at the people around you – Examine your work – sense of time management – Time is money – Features of Time – Three secrets of time management – Time management matrix – Analysis of time matrix – Effective scheduling – Group of activities – Five steps to successful time management – difficulties in time management – Evil of not planning – time management is a myth – overcoming procrastination – ways to find free time – Time Management tips for students – Interesting facts about time – Ideal way of spending a day – time wasters – time savers – realizing the valve of time – time circle planner.

Activity: Test your time management skills.

14. Stress Management

Introduction – Meaning – At one level stress may be a positive aid to performance – At one level stress may be a negative aid to performance – Effects of stress – Kinds of stress – sources of stress – Few other common sources of stress case study – behaviors identified with

stress – Assessing the existence of stress – What are signs of stress? – Spotting stress in you – stress management tips : Teenage stress – Make the mornings memorable.

REFERENCE BOOKS:

1 Soft Skills : Life skills, Communication Skills, Employability skills and Corporate skills.
Authors : S. Hariharan, N. Sundararajan and S.P. Shanmugapriya
Publishers : MJP Publishers
2 Soft Skills : Know yourself and know the world.
Authors : Alex
Publishers : S Chand & Co., New Delhi.
3 Making work for highly sensitive person.
Authors : Bevertly Jaeger, Ph.D.
Publishers : Tata Mcgraw hill Education

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16AS3403 PROFESSIONAL SOCIETY ACTIVITIES-II

Professional Society Activities (PSA) course is aimed at enhancing the self learning, communication, managerial skills of the students by engaging them in various Co & Extra Curricular activities activities during their course of study. Activities in each of the department shall be designed and conducted by the Professional Society Executive Committee whose composition is:

1. Faculty Mentors- 2 No.
2. Student Chairman: 1 No.- Final year Student
3. Student General Secretary: 1 No.- Third year Student
4. Treasurer: 1 No.- Third year Student

Student Members: 2 No.s from each class

PSA related activities would be of the following nature but not limited to:

Activity#0 : Constitution of Student Body at respective departments & Inaugural Function

Activity#1 : Just A Minute

Activity#2 : Technical Quiz

Activity#3 : Open House- Lab Demo

Activity#4 : Technical Paper Presentation- Preliminary

Activity#5 : Technical Paper Presentation- Final

Activity#6 : Poster Presentation

Activity#7 : Collage- A theme based event

Activity#8 : Debate Competition

Activity#9 : Group Discussion Competition

Activity#10 : Mock Interviews

Activity#11 : Model Exhibition

Activity#12 : Valedictory Function

Composition of Professional Society Executive Committee:

6. Faculty Mentors- 2 No.
7. Student Chairman: 1 No.- Final year Student
8. Student General Secretary: 1 No.- Third year Student
9. Treasurer: 1 No.- Third year Student
10. Student Members: 2 No.s from each class