VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
Ibrahimbagh, Hyderabad-31

Approved by A.I.C.T.E., New Delhi and
Affiliated to Osmania University, Hyderabad-07

Sponsored by
VASAVI ACADEMY OF EDUCATION
Hyderabad

SYLLABI UNDER CBCS FOR B.E I & II SEMESTERS OF MECHANICAL ENGINEERING (R-25) WITH EFFECT FROM 2025-26 (For the students admitted in 2025-26)

DEPARTMENT OF MECHANICAL ENGINEERING

+91-40-23146060, 23146061
Fax: +91-40-23146090
Website: www.vce.ac.in

VISION OF THE INSTITUTE

Striving for a symbiosis of technological excellence and human values.

MISSION OF THE INSTITUTE

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

VISION OF THE DEPARTMENT

To establish global leadership in the field of mechanical engineering and develop competent human resources with values and ethics

MISSION OF THE DEPARTMENT

To nurture an environment of research, innovation and knowledge through the latest teaching-learning practices in mechanical engineering

PROGRAM OUTCOMES (POs)	
1	Graduates demonstrate knowledge of basic sciences and mechanical engineering.
2	Graduates demonstrate an ability to identify, formulate and solve engineering problems
3	Graduates demonstrate an ability to design and conduct experiments, analyze and interpret data.
4	Graduates demonstrate an ability to design a system, component or process as per needs and specifications
5	Graduates demonstrate skills to use modern engineering tools, software and equipment to analyze for problem solving.
6	Graduates demonstrate an ability to visualize and work on laboratory and multi disciplinary tasks.
7	Graduate shows the understanding of impact of environment and society of engineering solutions and aim to provide sustainable solutions.
8	Graduates demonstrate knowledge of professional and ethical responsibilities.
9	Graduates shall be able to work independently and also in multi disciplinary teams
10	Graduates are able to communicate effectively in both verbal and written form.
11	Graduates will demonstrate the ability to handle the projects through appropriate project management techniques.
12	Graduates develop confidence for self education and ability for life-long learning

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

The mechanical engineering graduates will

PEO1 possess the required foundation and knowledge in the field of mechanical engineering.

PEO2 advance professionally as a result of their ability to solve technical problems and work in multidisciplinary teams leading to significant contribution to the industry

PEO3 acquire life long learning through training programs and higher qualifications.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1 Apply principles of basic sciences and engineering to mechanical systems

PSO2 Model, analyze, design, and realize mechanical components and processes

PSO3 Be prepared to work professionally and ethically in thermal, design and manufacturing areas of mechanical engineering

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

SCHEME OF INSTRUCTION AND EXAMINATION (R-25)

B.E. – MECH : FIRST SEMESTER (2025-2026)

B.E (MECH) I Semester								
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
THEORY								
U25BS110MA	Matrices & Calculus	3		-	3	60	40	3
U25BS130CH	Applied Chemistry for Mechanical Engineers	2	-	-	3	60	40	2
U25ES110CE	Engineering Mechanics-Statics	3	-	-	3	60	40	3
U25ES120EE	Basic Electrical and Electronics Engineering	2	-	-	3	60	40	2
U25ES120CE	Engineering Drawing-I	1	-	2	3	60	40	2
U25PC110ME	Materials Engineering	3	-	-	3	60	40	3
U25HS020EH	Human Values and Professional Ethics-I	1	-	-	2	40	30	1
U25MC010CE	Environmental Science	1	-	-	3	40	30	0
PRACTICALS								
U25BS011CH	Chemistry Lab	-	-	2	3	50	30	1
U25ES121EE	Basic Electrical and Electronics Engineering Lab	-	-	2	3	50	30	1
U25PC111ME	Materials Engineering Lab	-	-	2	3	50	30	1
U25ES111ME	Engineering Workshop-I	-	-	2	3	50	30	1
TOTAL		16	0	10	-	640	420	20
GRAND TOTAL		26			-	1060		20

1) Students are required to complete one NPTEL certification course of 8 weeks or 12 weeks duration (equivalent to 2 credits) by the end of the VI semester as part of their academic curriculum. However, students who wish to pursue a B.E. Honours or B.E. Minors program must complete one 8-week or 12-week NPTEL certification course related to Mechanical Engineering or its allied fields by the end of the IV semester.
2) Left over hours allotted to Sports / Library / PDC / Mentor Interaction / CC / RC / TC / CCA / ECA

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF MATHEMATICS

MATRICES & CALCULUS

SYLLABUS FOR B.E I – SEMESTER
(Common to Civil, EEE, ECE, Mech)

Instruction : 3+1 Hrs / week	SEE Marks : 60	Course Code : U25BS110MA
Credits : 3	CIE Marks: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	At the end of the course students should be able to:
1. Study the concepts of rank of a matrix, System of linear equations and LU-Decomposition method. 2. Learn the concepts of eigen values, eigen vectors, diagonalization, and canonical forms. 3. Develop a deep understanding of the concepts and applications of Taylor's series, Maclaurin's series, curvature, radius of curvature, centre of curvature, and evolutes. 4. Learn the techniques for finding partial derivatives of functions of several variables and Taylor's series for functions of two variables, methods for finding maxima and minima of functions of several variables. 5. Understand the fundamental concepts of infinite series and various tests for convergence.	1. Compute the rank of a given matrix and solution of a system by LU-Decomposition method. 2. Find the characteristic equation, eigen values, and eigen vectors and to diagonalize a square matrix using similarity transformation. 3. Apply the concepts of Taylor's series and Maclaurin's series to approximate functions and to find the curvature, radius, centre of curvature and evolutes of curves. 4. Calculate partial derivatives of functions of several variables and apply Taylor's series for functions of two variables, analyze functions to find maxima and minima. 5. Identify an appropriate test and determine nature of a series.

UNIT- I (08 classes)

MATRICES-I

Rank of a Matrix- Echelon form - Linearly Dependence and Independence of Vectors– Consistency and Inconsistency of Homogeneous and Non-Homogenous system of linear equations.

UNIT –II (08 classes)

MATRICES-II

Characteristic equation- Cayley - Hamilton Theorem (without proof) -Eigen values and Eigen vectors - Diagonalization using Orthogonal Transformation- Quadratic form- Reduction of Quadratic form to Canonical form.

UNIT – III (08classes)
DIFFERENTIAL CALCULUS
Taylor's Series – Maclaurin's Series - Curvature - Radius of Curvature – Centre of Curvature – Evolutes (Cartesian and Parametric forms of the curves).

UNIT – IV (08 classes)
MULTIVARIBLE CALCULUS
Limits- Continuity (Concepts) - Partial Derivatives - Higher Order Partial Derivatives - Total Derivates - Derivatives of Composite and implicit functions - Taylor's series of functions of two variables - Maxima and Minima of functions of two variables - Lagrange's Method of multipliers.

UNIT-V (08 classes)
INFINITE SERIES
Introduction to Infinite Series - Nature of the Series – Series of positive terms - Geometric series- p-series test - Comparison tests – Limit form of comparison test - D'Alembert's Ratio Test – Cauchy's nth root test - Alternating Series – Leibnitz test – Absolute Convergence.

Text Books:
1 Advanced Engineering Mathematics, Third Edition, R. K. Jain and S. R. K. Iyengar, Narosa Publishing House.
2 Higher Engineering Mathematics, B. S. Grewal 40th. Edition, Khanna Publishers.

Reference Books:
1 Advanced Engineering Mathematics 8th Edition by Erwin Kreyszig, John Wiley & Sons.
2 Differential Calculus by Shanti Narayan, S. Chand & Co
3 Vector Calculus – Schaum's outline series.

Online Resources:
1. https://onlinecourses.nptel.ac.in/noc24_ma03/preview
2. https://onlinecourses.nptel.ac.in/noc24_ma31/preview
3. https://onlinecourses.swayam2.ac.in/cec24_ma10/preview

The break-up of CIE : Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	: 2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	: 3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	: 3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests:90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CHEMISTRY

APPLIED CHEMISTRY FOR MECHANICAL ENGINEERS

SYLLABUS FOR B.E I – SEMESTER

Instruction : 2 Hrs / week	SEE Marks:60	Course Code : U25BS130CH
Credits : 2	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES:	COURSE OUTCOMES
The course will enable the students to:	At the end of the course students should be able to:
1. Study types of conductance, variation of electrode potential and EMF and to acquaint with applications of Galvanic Cell. 2. Classify and compare various types of batteries and fuel cells. 3. Familiarize with the significance and characteristics of fuels and lubricants. 4. Get acquainted with different types of polymers and their applications.	1. Construct a galvanic cell and calculate its EMF and pH wherever applicable. 2. Describe the construction, functioning and applications of the selected primary, secondary batteries and fuel cells. 3. Explain the significance and characteristics of fuels and Lubricants. 4. Classify the polymers and applications of a few polymers.

CO-PO MAPPING FOR APPLIEDCHEMISTRY

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	2	-	-	-	-	-	-	-	-	-	1
2	3	2	-	-	-	-	2	-	-	-	-	2
3	3	1	-	-	-	-	2	-	-	-	-	1
4	3	2	-	-	-	-	2	-	-	-	-	1

UNIT-I: ELECTROCHEMISTRY (10)

Introduction, conductance, types of conductance – specific, equivalent, molar conductance and their interrelationship- numericals. Principle and applications of conductometric titrations – strong acid *vs* strong base, week acid *vs* strong base and mixture of acids *vs* strong base.

Cells – electrolytic and electrochemical cells. Nernst equation-derivation, applications and numericals. Types of electrodes- construction and working of calomel electrode (CE), quinhydrone electrode and glass electrode (GE). Determination of pH using glass electrode and quinhydrone electrode. Applications of potentiometry – acid base titrations.

UNIT-II: CHEMISTRY OF BATTERIES (9)

Introduction- definition of cell and battery – Types of cells (reversible and irreversible cells). Battery characteristics: free energy change, electromotive force of battery, power density, energy density – numericals.

Primary batteries: Construction and electrochemistry of Zn-Ag_2O battery and lithium-V_2O_5 battery.

Secondary batteries: Construction and working of lead-acid storage cell and lithium ion battery – advantages, limitations and applications.

Fuel cells: Concept, types of fuel cells and merits. Construction, working and applications of methanol-oxygen fuel cell and phosphoric acid fuel cell.

UNIT-III- LUBRICANTS AND FUELS (10)

a) FUELS:

Introduction, classification, requisites of a good fuel. Calorific value (CV)-HCV and LCV. Calculation of CV using Dulong's formula- numericals.

Liquid Fuels: Composition and CV of gasoline, cracking: Fixed bed catalytic cracking method. Knocking and its significance, octane number, enhancement of quality of gasoline by reforming and anti- knock agents. Leaded and unleaded petrol, power alcohol. **Bio-diesel:** Source, chemistry of transesterification and advantages of bio diesel.

b) LUBRICANTS:

Need for lubricants, definition, classification: solid, semi solid and liquid lubricants, Properties of lubricants and significance of – Viscosity, viscosity index, Flash point, Pour point and Saponification number- Determination of Viscosity by red wood viscometer - Application of lubricants.

UNIT-IV: POLYMER CHEMISTRY (10)

Introduction, degree of polymerization, functionality of monomers and its effect on structure of polymer. Classification of polymers – i) homo and co-polymers; ii) homo chain and hetero chain polymers; iii) plastics, elastomers, fibers and resins.

Plastics: Thermo plastics and thermosets – preparation, properties and applications of i) Epoxy resin (bisphenol and epichlorohydrin); and ii) PVC(Plasticized and unplasticized) .

Polymer composites: Introduction, advantages of composites over conventional materials, Classification of composites. Manufacturing methods-Hand lay up and RTM method.

Biodegradable polymers: Concept, preparation and uses of polylactic acid and polyvinyl alcohol.

Conducting polymers: Definition- classification, mechanism of conduction in polyacetylene (Undoped) and applications.

Text Books:

1. P. C. Jain, M Jain Engineering Chemistry, Dhanapathi Rai publishing company (17th edition), New Delhi.
2. O. G. PALANNA, Engineering Chemistry, TMH Edition.

Learning Resources:

1. B. H. Mahan, University Chemistry.
2. B. L. Tembe, Kamaluddin and M. S. Krishnan, Engineering Chemistry (NPTEL Web-book).
3. P. W. Atkins, Physical Chemistry.
4. S. S. Dara, S Chand and sons, Engineering Chemistry, New Delhi.
5. Puri, Sharma and Pathania, Principles of Physical Chemistry, Vishal Publishing Co.
6. D. Dhara, IIT Kharagpur, NPTEL Polymer Chemistry Course.
7. Gowarikar V R, Polymer chemistry, V Edition.
8. S M Lindsay, Introduction to Nanoscience, Oxford University press.
9. Sashi Chawla, Text book of Engineering Chemistry, Dhanapathi Rai & Co, New Delhi.
10. J.C. Kuriacose and Rajaram, Chemistry in Engineering and Technology
11. Wiley Engineering Chemistry, Wiley India pvt Ltd, II edition.
12. Peter Grundler, Chemical sensors, An introduction for scientists and engineers, Springers

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	02	Max. Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: **90 Minutes**

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING MECHANICS - STATICS

SYLLABUS FOR B.E. I SEMESTER

L : T : P(Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U25ES110CE
Credits: 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	At the end of the course, students will be able to:
1. Explain the resolution of a system of forces (coplanar, concurrent, non-concurrent) and compute their resultant. 2. Solve particle equilibrium problem using equation of equilibrium 3. Determine forces in the members of a truss 4. Perform analysis of bodies lying on rough surfaces. 5. Locate the centroid of a body and also compute the area moment of inertia of standard sections, along with product of inertia and mass moment of inertia.	1. Determine resultant of forces acting on a body. 2. Analyse equilibrium of a body subjected to a system of forces. 3. Perform analysis of trusses using method of joints and method of sections. 4. Solve problem of bodies subjected to friction. 5. Find the location of centroid and calculate moment of inertia of a given section, along also able to find product of inertia and mass moment of inertia for given shape.

UNIT-I: Force Systems: Rectangular components, moment, couple and resultant of two dimensional force systems.

UNIT-II: Equilibrium of Force Systems: Free body diagram, Equations of equilibrium, Equilibrium of two dimensional force systems.

UNIT-III: Determinate Trusses: Analysis of plane trusses like Warren truss, Pratt truss, Fink truss etc using method of joints and method of sections.

UNIT-IV: Friction: Laws of friction. Application to simple systems, Connected systems Wedge friction.

UNIT-V: Centroid and Moment of Inertia: Centroids of lines, areas and volumes, Moment of inertia of areas, Composite areas, Polar moment of inertia, Radius of gyration.

Product of Inertia & Mass moment of Inertia: Product of inertia, Mass moment of inertia for solid and composite bodies, Radius of gyration.

Learning Resources:

1. Singer F.L "Engineering Mechanics", Harper & Collins, Singapore, 3rd Edition 2011.
2. Timoshenko S.P and Young D.H "Engineering Mechanics", McGraw Hill International Edition, 2017
3. Andrew Pytel., JaanKiusalaas., "Engineering Mechanics", 4th edition, Cengage Learning, 2015.
4. Beer F.P & Johnston E.R Jr. "VectorMechanics for Engineers", TMH, 2019.
5. Hibbeler R.C, "Engineering Mechanics", 4th edition, Pearson Education, 2017.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", 4th edition, Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2014, 2nd edition.
8. Meriam. J. L. and Kraige L.G., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2017.
9. NPTEL Course (www.nptel.ac.in)
10. Virtual labs (www.vlab.co.in)

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Electrical & Electronics Engineering

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

SYLLABUS FOR B.E I – SEMESTER

L:T:P(Hrs/week): 2:0:0	SEE Marks: 60	Course Code: U25ES120EE
Credits : 02	CIE Marks: 40	Duration of SEE: 03 Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
The objective of this course is to provide an understanding of Electronic Devices, Linear and Digital circuits, enhancing the ability to solve the problems using fundamental concepts of AC circuits, three phase connections, principle of operation of Transformers, DC machines and AC machines.	1. Apply the fundamental concepts to solve the problems in single phase and 3 phase AC circuits. 2. Analyze the behavior of transformer and demonstrate the principle of operation and performance Characteristics of DC Machines. 3. Select suitable three phase induction motor and also interpret speed control Method for different applications. 4. Understand the number system, different codes, and code conversion and Design different combinational circuits.

Unit-I

Electrical Circuits:

Ohm's law, KCL, KVL, single phase AC circuit fundamentals, power, powerfactor, 3 Phase AC circuits–star and delta Connection.

Unit-II

DC Machines: Construction and principle of operation, classification, back emf, torque equation, speed torque characteristics,speed control of DC motor, applications.

AC Machines:

1-ϕ Induction Motor: operating principle of split phase, capacitor start & capacitor run induction motor.

3 -ϕ Induction Motor: construction, principle of operation, speed Torque characteristics.

Single phase Transformers: Types of transformer, construction and working principle.

Unit-III

Electronic Devices and Circuits: Operation and V–I characteristics of PN Junction diode, BJT, MOSFET and SCR, applications. Half wave and full wave uncontrolled rectifier, basic filters.

Unit–IV

Digital Electronics: Number systems, logic gates, half adder, full adder, parallel adder/ subtractor, flipflops – RS, JK, T and D.

Learning Resources:

1. Mehta.V.K and Rohit Mehta, "Principles of Electrical Engineering and Electronics", S.Chand & Co. Limited, New Delhi, 2006.
2. Muthusubramanian. R, Salivahanan. Sand Muraleedharan. K.A, "Basic Electrical, Electronics and Computer Engineering", Tata McGraw-Hill Publishers, 2006.
3. Murugesh Kumar. K, "Basic Electrical Science and Technology", Vikas Publishing Limited, 2011.
4. Roy Choudhury and ShailJain, "Linear Integrated Circuits", New Age International Limited, 2003.
5. Leach. D. P, Malvino. A.P and GoutamSaha, "Digital Principles and Applications", Tata McGraw –Hill, 2008.

The break-up of CIE : Internal Tests+Assignments+Quizzes

1.	No. of Internal Tests	: 2	Max. Marks for each Internal Test	:	30
2.	No. of Assignments	: 3	Max. Marks for each Assignment	:	5
3.	No. of Quizzes	: 3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING DRAWING-I

SYLLABUS FOR B.E. I-SEMESTER

L : T : P (Hrs./week): 1:0:2	SEE Marks: 60	Course Code: U25ES120CE
Credits: 02	CIE Marks: 40	Duration of SEE: 03 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	At the end of the course, students will be ableto:
1. Impart skills of drawing instruments and their use to convey exact and complete information of any object. 2. Explore various scales in engineering practice. 3. Construct engineering curves. 4. Prepare orthographic projections of points, lines, planes and solids.	1. Identify the qualities of precision and accuracy. 2. Convey technical information effectively through sketches / drawings. 3. Construct engineering curves with different methods. 4. Develop the conics using different methods, hypocycloidal and involutes. 5. Draw the orthographic projection of points, lines, planes and solids.

UNIT-I: Introduction: Instruments and their ruses, lettering, types of lines and dimensioning methods.

Scales: Reduced and Enlarged scales, Representative fraction, Scales: plain, diagonal only, Regular Polygons: Polygons given the length of side only.

UNIT-II: Engineering Curves: Ellipse, Parabola and Hyperbola (Eccentricity method only), Cycloid, Epicycloids, Hypocycloid and Involutes.

UNIT-III: Projection of Points and Straight lines: Orthographic projection, Projection of points placed in different quadrants, Projection of straight lines inclined to one and two reference planes placed in first quadrant only, Traces.

UNIT-IV: Projections of Planes: Projection of perpendicular planes, Oblique planes and Traces of planes.

UNIT-V: Projection of Solids: Polyhedral, Solids of revolution, Projections of solids in simple position (prisms, pyramids, cylinders and cones), axis inclined to one plane, Axis inclined to both the reference planes, Projection of solids using auxiliary plane method.

Learning Resources:

1. Bhatt N.D. "Elementary Engineering Drawing", Charotar Publishers, 54th edition, 2023.
2. Thomas E French, Charles J Vierck, Robert J. Foster, "Engineering Drawing and Graphic Technology", McGraw Hill Education, 2012.
3. Gill P.S. "Engineering Drawing": Geometric Drawing", SK Kataria & sons, 2012.
4. Venugopal. K "Engineering Drawing and Graphics Plus Autocad" New Age International (P) Ltd., NewDelhi,2010.
5. Siddiquee A.N "Engineering Drawing with a Primer on Autocad", Prentichall of India Ltd, New Delhi, 2004.
6. Basanth Agrawal, Agrawal C.M. "Engineering Graphics" First Edition, Tata Mc Graw Hills, 2012.
7. BVR Gupta, M. Raja Roy, "Engineering Drawing with Autocad", IK Int Pvt. Ltd, 2009.
8. NPTEL Course (www.nptel.ac.in)
9. Virtual labs (www.vlab.co.in)

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF MECHANICAL ENGINEERING

MATERIALS ENGINEERING
SYLLABUS FOR B.E. I-SEMESTER

L : T : P (Hrs./week): 3 : 0 : 0	SEE Marks: 60	Course Code: U25PC110ME
Credits : 03	CIE Marks: 40	Duration of SEE: 03 Hrs

COURSE OBJECTIVE The objective of the course is to	**COURSE OUTCOMES** On completion of the course, students will be able to
study phase diagrams, heat treatment, crystal defects, loading and failure of metals and alloys.	1 summarize the relationship between crystal structure, crystal defects and mechanical properties 2 interpret binary phase diagrams of metals and alloys to assess property changes that occur during equilibrium cooling or heating 3 interpret iron-iron carbide equilibrium diagrams to assess property changes that occur during equilibrium cooling or heating of steels and cast irons. 4 examine property changes in metals and alloys due to different heat treatment processes 5 explain properties and applications of alloy steels and non ferrous alloys.

CO-PO and CO-PSO mapping															
CO	PO mapping												PSO mapping		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	2	3	2							2	2	1	1
CO2	2	2		1								2	3	1	1
CO3	2	2		1								2	3	1	1
CO4	2	3		1								2	2	2	3
CO5	3	3	1	2	1							2	2	1	1

UNIT-I: CRYSTAL STRUCTURE
Defects in crystals, point, line, surface and volume defects. Mechanisms of plastic deformation: slip and twinning, Critical resolved shear stress, Hall - Petch equation, cold working and hot working, strain Hardening and Bauschinger effect. Recovery, Recrystallisation, Grain growth and its effect on mechanical properties of metals.

UNIT-II: PHASE DIAGRAMS OF BINARY NON-FERROUS ALLOYS
Cooling curves of pure metal, isomorphous alloy, eutectic alloy and off-eutectic alloys, Gibb's phase rule, Construction and interpretation of Thermal equilibrium diagrams of binary nonferrous alloys – isomorphous, eutectic and partial eutectic systems. Lever rule, equilibrium cooling of different alloys of the above phase diagrams.

UNIT-III: IRON-IRON CARBIDE EQUILIBRIUM DIAGRAM

Cooling curve of pure iron, micro constituents of iron and carbon system, Iron-Iron Carbide Equilibrium diagram, Study and interpretation. Study of Eutectic, Eutectoid, Peritectic reactions.

Plain Carbon Steels: types, properties and applications

Cast Irons: types, properties and applications.

UNIT-IV: HEAT TREATMENT

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

UNIT-V: ALLOY STEELS AND NON-FERROUS ALLOYS

Effects of alloying elements like Nickel, Chromium, Manganese, Silicon and Tungsten and Titanium. Stainless steels, HSS, Brass, Bronze, Duralumin and Ti Alloy (Ti– 6Al–4V) – their composition, properties and applications.

Super alloys: Hastealloy and inconel - their composition, properties and applications.

Brief introduction to shape memory alloys.

Learning Resources:

1. V. Raghavan, "Material Science and Engineering", 5th Edition, Prentice Hall of India Ltd., 1994.
2. S.H. Avner, "Introduction to Physical Metallurgy", 2ndEdition, Tata McGraw Hill, 1997.
3. William D. Callister and David G. Rethwisch, "Materials Science and Engineering: An Introduction", 9th Edition, John Wiley and Sons Ltd., 2014
4. OP Khanna, "Metallurgy and Material Science" . S. Chand, New Delhi 2005.
5. E. Dieter, "Mechanical Metallurgy", 3rdEdition, Tata McGraw Hill, 1997.
6. William F Smith, JavadHashemi, Ravi Prakash, "Material Science and Engineering", 5th Edition, McGraw Hill Education, 2014.
7. Physical Metallurgy Principles - Robert E Reed-Hill and Reza Abbaschian, 4th Edition, Cengage Learning.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

HUMAN VALUES AND PFOFESSIONAL ETHICS-1

SYLLABUS FOR B.E. I-SEMESTER

L : T : P (Hrs./week):1:0 :0	SEE Marks:40	Course Code: U25HS020EH
Credits: 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	At the end of the course, students will be able to:
1. Get a holistic perspective of value- based education. 2. Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations 3. Understand professionalism in harmony with self and society. 4. Develop ethical human conduct and professional competence. 5. Enrich their interactions with the world around, both professional and personal.	1. Understand the significance of value inputs in a classroom and start applying them in their life and profession 2. Distinguish between Personal and Professional life goals–constantly evolving into better human beings and professionals. 3. Work out the strategy to actualize a harmonious environment wherever they work. 4. Distinguish between ethical and unethical practices, and start implementing ethical practices 5. Apply ethics and values in their personal and professional interactions.

UNIT-1 HARMONY WITH SELF AND FAMILY

Understanding and living in harmony at various levels-with self, family, society and nature and the Ethical and moral values**:** which include self-sufficiency, self-determination, self-advocacy, self-competence, self-direction, self-efficacy's, self-regulation, self-reliance, and self-responsibility. This also includes Family values involving all the ideas of how you want to live your family life, and they are often passed down from previous generations.

1.1 Self-Values and Ethics
1.2 Family – Values and Ethics
1.3 Self-Care Practices

UNIT-2 PROFESSIONAL VALUES AND BEHAVIOUR

At the level of individual: as socially and ecologically responsible engineers and technologists. Team Work: Developing Credibility and building trust by having open and truthful communication. This includes recognizing the value of time and respecting time of self and others.

2.1 Professional Ethics – Individual
2.2 Professional Behaviour - Body Language and Etiquette
2.3 Professional Ethics – Team

UNIT-3 SOCIAL VALUES

Values of service, social justice, dignity and worth of the person Importance of human relationships, integrity, and competence.

3.1 Understanding Social Values
3.2 Importance of relationship
3.3 Diversity and Inclusion

UNIT -4 SPIRITUAL VALUES

Developing individual practice has to do with having a sense of peace and purpose. Spiritual values, namely, benevolence, charity, dignity, forbearance, hope, humility, kindness, love, modesty, peace, perseverance, piety, repentance, righteous, sacredness, sincerity, steadfastness, striving, trusting, truthfulness, unity, and wisdom.

4.1 Exploring Different Traditions
4.2 Values in Action
4.3 Spirituality in Everyday Life

MODE of DELIVERY

• Questionnaires • Quizzes • Case-studies • Observations and practice • Home and classroom assignments	• Discussions • Skits • Short Movies/documentaries • Team tasks and individual tasks • Research based tasks • Viva

Relevant Websites, CD's and Documentaries

- https://plato.stanford.edu/

Learning Resources:

learn.talentsprint.com

1. Sapiens: A Brief History of Humankind By Yuval Noah Harari
2. How to Think About What You Don't Know: The Art of Counterfactual Thinking by Judith Lichtenberg
3. Ethics in the Professions by Charles E. W. Tessera
4. Thinking in Ethics: A Practical Guide to Right and Wrong by Jeanne Halifax

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	1	Max. Marks for each Internal Tests	:	20
2	No. of Assignments	:	2	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	2	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	60 Minutes			

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

ENVIRONMENTAL SCIENCE

SYLLABUS FOR B.E. I-SEMESTER

L: T: P (Hrs/Week): 1:0:0	SEE Marks:40	Course Code:U25MC010CE
Credits : - - -	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Explain the scope and fundamental principles of environmental science, including key concepts such as ecosystem structure, function, and biodiversity. 2. Characterize genetic, species, and ecosystem diversity, and articulate the various values of biodiversity. 3. Analyze the causes, effects, and control measures for air, water, and land pollution—and apply major regulatory frameworks 4. Evaluate the environmental impacts of food-related practices and propose sustainable, health-oriented alternatives. 5. Assess renewable energy resources and design integrated, engineering-based solutions that meet environmental, legal, and societal requirements.	1. Define and illustrate core environmental science concepts—ecosystem structure, energy flow and levels of biodiversity. 2. Apply key legislative frameworks to real-world scenarios involving air, water, and land resource management. 3. Analyze the environmental fate and impacts of agricultural inputs on food systems, recommending sustainable practices. 4. Compare and evaluate major renewable energy technologies in terms of availability, efficiency, cost, and environmental footprint. 5. 5. Integrate scientific data, legal requirements, and engineering principles to design a mini-project addressing a local environmental challenge.

UNIT-I: Environmental Science Fundamentals and Ecosystem Diversity: Definition and importance of Environmental Science, Ecosystem: classification, structure, and function, Diversity: genetic, species, and ecosystem level. Biodiversity values: productive, consumptive, ethical, social, cultural, optional, Biodiversity Acts and Laws: The Biological Diversity Act-2002, Environment (Protection) Act- 1986.

UNIT-II: Air, Water, and Land Resources: Air Pollution: The Air (Prevention and Control of Pollution) Act- 1981, Water Resource: Freshwater availability on Earth, Drinking water quality standards | IS 10500:1991, Water

pollution: effects and control measures, Case studies. Land Resource: Desertification, Land degradation: causes, effects, and control, Case studies

UNIT-III: Food Resources and Environmental Issues: Food Resource: Fertilizer and pesticide problems, Eutrophication, Biomagnification, Balanced diet, Effects of processed food, Case studies

UNIT-IV: Renewable Energy Resources and current relevant issues: Importance of renewable energy sources: Solar, Wind, Tidal, Ocean thermal, Geothermal, Biomass, Biofuel, Biogas, Hydrogen energy, Case studies, Climate change adaptation Sustainability, life cycle assessment, use of AI in disaster risk reduction.

Learning Resources:

1. Deswal S. and Deswal A., A Basic Course on Environmental studies, Dhanpat Rai & Co Pvt. Ltd. 2013.
2. Benny Joseph, Environmental Studies, Tata McGraw-Hill, 2006.
3. Suresh K. Dhameja, Environmental Studies, S.K. Kataria& Sons, 2010.
4. De A.K., Environmental Chemistry, New Age International, 2003.
5. Odum E.P., Fundamentals of Ecology, W.B. Sunders Co., USA, 2004.
6. Sharma V.K., Disaster Management, National Centre for Disaster Management, IIPE, Delhi, 2013.
7. Rajagopalan R., Environmental Studies, Second Edition, Oxford University Press, 2013.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	1	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	2	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	2	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CHEMISTRY

CHEMISTRY LAB

SYLLABUS FOR B.E. I SEMESTER

L: T: P (Hrs/Week): 2:0:0	SEE Marks: 50	Course Code: U25BS011CH
Credits : 01	CIE Marks: 30	Duration of SEE: 03 Hrs

COURSE OBJECTIVES:	COURSE OUTCOMES:
The course will enable the students to:	At the end of the course, students should be able to:
1. Promote adherence to laboratory safety precautions and ethical scientific practices 2. Describe the quantitative analytical techniques 3. Learn the skills to handle the instruments 4. Apply the theoretical principles in experiments	1. Estimate the amount of metal ions in the given solutions. 2. Analyze the hardness, alkalinity and chloride content of a given water sample. 3. Dete rmine the concentration a given solution by conductometry, potentiometry and pH metry. 4. Use the principle of colorimetry in the estimation of Permanganate / Copper (II) in a given solution.

CO-PO MAPPING FOR CHEMISTRY LAB

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	2	-	-	-	-	-	-	2	-	-	1
2	3	2	-	-	-	-	-	-	2	-	-	1
3	3	2	-	-	-	-	-	-	2	-	-	1
4	3	2	-	-	-	-	-	-	2	-	-	1

Note: Minimum of Ten experiments of the following.

1. Preparation of standard FAS or oxalic acid solution and standardization of $KMnO_4$ or NaOH solution.
2. Estimation of Iron(II) in the given solution by permanganometry.
3. Estimation of chromium(VI) in the given solution by standardized FAS.
4. Estimation of copper(II) in given solution by Iodometry.
5. Estimation of total hardness of given water sample.
6. Estimation of alkalinity of a given sample.

7. Conductometric acid-base titrations -Determination of strength of given acids (HCl *Vs* NaOH and CH_3COOH *Vs* NaOH).
8. Conductometric acid-base titrations- Determination of strength of acids in a given mixture of acids (HCl and CH_3COOH *Vs* NaOH)
9. Determination of strength of a given acid by Potentiometry.
10. Determination of concentration of a given $FeSO_4$ using redox titration by Potentiometry.
11. Determination of strength of a given acid by pH metry.
12. Determination of strength of permanganate or copper by Colorimetry.

Learning Resources:

1. G H Jeffery, J Bassett, J Mendham, R C Denney, Vogel's text book of quantitative chemical analysis, Fifth Edition.
2. M S Kaurav, Engineering chemistry with laboratory experiments, PHI learning (P) ltd, New Delhi.
3. Sunita rattan, Experiments in applied chemistry, S K Kataria& Sons (2010)
4. A text book on experiments and calculation Engg. S.S. Dara.

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: 2 Hours			

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB
SYLLABUS FOR B.E. I SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks: 50	Course Code: U25ES121EE
Credits : 01	CIE Marks: 30	Duration of SEE: 03 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
To introduce to students the basics of Electrical and Electronic circuits, electrical machines.	1. To familiarize with the basic experiments on electrical and electronic fundamentals and machines. 2. Design the circuits related to digital IC's. 3. Able to apply the concepts of electrical and electronics circuits to engineering applications.

List of Experiments:

1. Verification of Ohm's law and Kirchoff's laws.
2. Mechanical characteristics of DC shunt and compound motor
3. Load test on 3 – phase induction motor.
4. Speed control of DC shunt motor.
5. Load test on single phase transformer.
6. V – I characteristics of BJT and MOSFET.
7. Study of full wave rectifiers with and without filters.
8. Study of logic gates
9. Implementation of binary half adder and full adder.
10. Implementation of binary half and full subtractor.

From the above experiments, each student should perform at least 10 (Ten) experiments.

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: 2 Hours			

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF MECHANICAL ENGINEERING

MATERIALS ENGINEERING LAB

SYLLABUS FOR B.E. I-SEMESTER

L :T:P (Hrs./week): 0 : 0 : 2	SEE Marks: 50	Course Code: U25PC111ME
Credits : 01	CIE Marks: 30	Duration of SEE: 03 Hrs

COURSE OBJECTIVE The objective of the course is to	**COURSE OUTCOMES** On completion of the course, students will be able to
prepare metallographic samples, observe micro structure for various metals, heat treatment of steel samples and examine micro structures using metal analyzer.	1 illustrate the relationship between microstructure and properties of ferrous alloys. 2 illustrate the relationship between microstructure and properties of non-ferrous alloys. 3 examine property changes in steels due to Annealing and Normalising processes. 4 examine property changes in steels due to Hardening and Tempering processes. 5 interpret the microstructure using image analyzer.

CO-PO and CO-PSO mapping															
CO	PO mapping												PSO mapping		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1		2	2				1	1			2	2	1	1
CO2	1		3	2				2	1			2	2	1	1
CO3	1		3	2				2	1			2	2	1	1
CO4	1		2	2				2	1			2	2	1	1
CO5	1		2	2				2	1			2	2	1	1

List of Experiments:

1. Study of General Procedure for Specimen preparation and Metallurgical Microscope.
2. Preparation of Mounted samples with the help of mounting press.
3. Metallographic study and analysis of Low Carbon Steel.
4. Metallographic study and analysis of Medium Carbon Steel.
5. Metallographic study and analysis of High Carbon Steel.
6. Metallographic study and analysis of Gray Cast Iron.
7. Metallographic study and analysis of Spheroidal cast iron.

8. Metallographic study and analysis of α– Brass.
9. Metallographic study and analysis of α– β Brass.
10. Metallographic study and analysis of Bronze.
11. Study of effect on Hardness of plain carbon steel before and after the following Processes: Annealing and Normalizing.
12. Study of effect on Hardness of plain carbon steel before and after the following Processes: Hardening and Tempering.
13. Measurement of hardenability using Jominy End Quench Test.
14. Study of crystal structure and calculation of packing factor of Simple Cubic, BCC, FCC and HCP crystals.
15. To evaluate the grain characteristics of a given ferrous specimen.
16. To evaluate the grain characteristics of a given non-ferrous specimen.

From the above experiments, each student should perform at least 12 (Twelve) experiments.

The break-up of CIE:

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: **2 Hours**			

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
Department of Mechanical Engineering

ENGINEERING WORKSHOP-I

SYLLABUS FOR B.E.I-SEMESTER

L:T:P(Hrs/week): 0:0:2	SEE Marks: 50	Course Code: U25ES111ME
Credits : 01	CIE Marks: 30	Duration of SEE: 03Hours

COURSE OBJECTIVES *The objective of the course is to*	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 know basic workshop processes, adopt safety practices while working with various tools 2 identify, select and use various marking, measuring, holding, striking and cutting tools & equipment.	1 create models in Carpentry, plumbing and Sheet metal trades by using the relevant tools. 2 measure and inspect the finished components using suitable measuring instruments. 3 document the observations and procedure in the record. 4 apply basic electrical and electronics engineering concepts to design and assemble simple electrical circuits, verify their functionality, and perform component soldering with proper safety and technique.

List of the Experiments:

PLUMBING:
1. Introduction of tools, joints, couplings and valves etc.
2. Pipe thread cutting and making single joint with coupling and tap connection.
3. Water shower connection with reducer coupling

ELECTRICAL & ELECTRONICS:
1. Two lamps in(a)series(b) parallel with 3 pin plug and switches
2. Staircase wiring and Tube light wiring
3. (a) Identification of electronic components
   (b) Soldering practice

CARPENTRY:
1. Half-lap joint
2. Dove-tail joint
3. Bridle joint

SHEET METAL:
1. Rectangular box
2. Rectangular scoop with handle
3. Making a funnel with soldering

Additional Experiments
1. Plumbing: Geyser connection(demo)
2. Carpentry: Wood turning operation (demo)
3. 3D Printing: slicing - orientation, build time.
4. Sheet Metal: Making a T-Joint (Demo).

Learning Resources:

1. Hajra Choudhury S.K., Hajra Choudhury A.K., Nirjar Roy S.K. "Elements of Workshop Technology" Vol-I 2008 & Vol-II 2010 Media Promoters & Publishers Pvt. Limited, Mumbai.
2. Kalpakjian S. and Steven R. Schmid, "Manufacturing Engineering and Technology" 4th Edition, Pearson Education India, 2002.
3. Gowri P., Hariharan and Suresh Babu A., "Manufacturing Technology-I", Pearson Education 2008.
4. P. Kannaiah& K. L. Narayana "Workshop manual" 2nd Ed., Scitech publications (I) Pvt. Ltd., Hyderabad.
5. B.L. Juneja, "Workshop Practice", Cengage Learning India Pvt. Limited, 2014.
6. www.technologystudent.com

The break-up of CIE:

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2 Hours			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-25)
BE (MECHANICAL ENGINEERING) I-SEMESTER AY 2025-2026
(Students Admitted in 2025-26)

SERVICE COURSES OFFERED BY MECHANICAL ENGINEERING DEPARTMENT

B.E I Semester								
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
PRACTICALS (CIVIL)								
U25ES012ME	Workshop Practice	-	-	2	3	50	30	1

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Mechanical Engineering

WORKSHOP PRACTICE

SYLLABUS FOR B.E. I SEMESTER (AY 2025-26)

(for Civil Engineering)

L:T:P(Hrs/week): 0:0:2	SEE Marks: 50	Course Code: U25ES012ME
Credits : 01	CIE Marks: 30	Duration of SEE: 03Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. know basic workshop processes, adopt safety practices while working with various tools 2. identify, select and use various marking, measuring, striking holding, and cutting tools & equipment.	At the end of the course, students will be able to: 1. Construct models related to carpentry, plumbing and welding trades using appropriate tools and techniques. 2. Measure and inspect finished components accurately using suitable measuring instruments. 3. Apply basic electrical and electronics engineering concepts to design and assemble simple electrical circuits, verify their functionality, and perform component soldering with proper safety and technique.

List of the Experiments:

ELECTRICAL & ELECTRONICS:

1. Two lamps in(a)series(b) parallel with 3 pin plug and switches
2. Staircase wiring and Tube light wiring
3. (a) Identification of electronic components
   (b) Soldering practice

CARPENTRY:

1. Half-lap joint
2. Dove-tail joint
3. Bridle joint

PLUMBING:

1. Introduction of tools, joints, couplings and valves etc.
2. Pipe thread cutting and making single joint with coupling and tap connection.
3. Water shower connection with reducer coupling

WELDING

1. Bead formation using arc welding
2. Butt joint & T joint using arc welding
3. Lap joint using gas welding`

ADDITIONAL EXPERIMENTS

1. Electrical & Electronics: LT Distribution with loads (Demo)
2. Carpentry: Wood turning operation (demo)
3. Demonstration of 3D printing of a component
4. Welding: Spot welding (demo)

Learning Resources:

1. Hajra Choudhury S.K., Hajra Choudhury A.K., Nirjar Roy S.K. "Element of Workshop Technology" Vol-I 2008 & Vol-II 2010 Media Promoters & Publishers Pvt. Limited, Mumbail
2. Kalpakjian S. and Steven S. Schmid, "Manufacturing Engineering and Technology" 4th Edition, Pearson Education India Edition, 2002.
3. Gowri P., Hariharan and Surech Babu A., "Manufacturing Technology-I", Pearson Education 2008.
4. P. Kannaiah & K.L. Narayana "Workshop manual" 2nd Ed., Scitech publications (I) Pvt. Ltd., Hyderabad.
5. B.L. Juneja, "Workshop Practice", Cengage Learning India Pvt. Limited, 2014.
6. www.technologystudent.com

The break-up of CIE : Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	1
2	Max. Marks for internal tests	:	12
3	No. of Quizzes Marks for day-to-day laboratory class work	:	18

Duration of Internal Test: 2 Hours

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION (R-25)

B.E. – MECH : SECOND SEMESTER (2025-2026)

B.E (MECH) II Semester								
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
THEORY								
U25HS010EH	English Language and Communication	2	-	-	3	60	40	2
U25BS210MA	Differential Equations & Vector Calculus	3	-	-	3	60	40	3
U25BS230PH	Engineering Physics	2	-	-	3	60	40	2
U25ES230CE	Engineering Mechanics-Dynamics	3	-	-	3	60	40	3
U25ES220CE	Engineering Drawing-II	1	-	2	3	60	40	2
U25PC210ME	Thermodynamics	3	-	-	3	60	40	3
U25HS040EH	Learning to Learn	1	-	-	2	40	30	1
PRACTICALS								
U25HS011EH	English language and Communication Skills Lab	-	-	2	3	50	30	1
U25BS211PH	Engineering Physics Lab	-	-	2	3	50	30	1
U25ES211ME	Engineering Workshop –II	-	-	2	3	50	30	1
TOTAL		15	-	8	-	550	360	19
GRAND TOTAL		**24**				**910**		**19**

1) Students are required to complete one NPTEL certification course of 8 weeks or 12 weeks duration (equivalent to 2 credits) by the end of the VI semester as part of their academic curriculum. However, students who wish to pursue a B.E. Honours or B.E. Minors program must complete one 8-week or 12-week NPTEL certification course related to Mechanical Engineering or its allied fields by the end of the IV semester.
2) Left over hours allotted to Sports / Library / PDC / Mentor Interaction / CC / RC / TC / CCA / ECA.

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

ENGLISH LANGUAGE AND COMMUNICATION

SYLLABUS FOR B.E.II-SEMESTER

L:T:P(Hrs/week): 2:0:0	SEE Marks: 60	Course Code: U25HS010EH
Credits : 02	CIE Marks: 40	Duration of SEE: 03 Hours

Course Objectives	Course Outcomes
The course will enable the learners to: 1. Build greater confidence and proficiency in oral and written communication. 2. Equip themselves with essential language skills to analyze and articulate their point of views. 3. Develop the ability to engage in reading for reflection and enquiry. 4. Construct grammatically correct and contextually appropriate correct sentences. 5. Learn how project reports are written in their related field of study.	At the end of the course the learners will be able to: 1. Demonstrate effective verbal and non-verbal communication skills and apply emotional intelligence and team-building concepts to real-life scenarios. 2. Listen actively and speak clearly and confidently in academic and professional contexts, including delivering structured presentations. 3. Employ reading techniques and write coherent, well-organized paragraphs, emails, and letters for different purposes and audiences. 4. Apply a broadened vocabulary and correct grammatical structures to construct meaningful and grammatically accurate sentences. 5. Analyse and appreciate literary texts, identifying themes, tone, and stylistic devices, and relate them to personal or societal contexts.

UNIT-1 1.0 Effective communication and Interpersonal skills (8hrs)

1.1 Role and Importance of Communication – Types of Communication (Verbal-non-verbal, formal- informal, oral, written, visual, intrapersonal, interpersonal and extra personal communication); styles, channels and barriers of communication.

1.2 Emotional Intelligence: Self-awareness, Self- regulation, Motivation, Empathy and Social skills

1.3 Johari Window.

1.4 Persuasion techniques.

1.5 Stages of Team Building by Bruce Tuckman; Qualities of a team player/leader.

UNIT-2 2.0 Listening and Speaking skills (4hrs)

2.1 Importance of listening-- Types of listening; Note taking.

2.2 Speaking skills: Presentation Skills (on Projects/ Topics related to the branch).

UNIT-3 3.0 Reading and Writing skills (5hr)

3.1 Reading strategies- SQ3R (Survey, Question, Read, Recite &Review); Types of Comprehension - Global, Factual and Inferential.

3.2 Features of Writing-Principles of writing paragraphs (Coherence, Cohesion& Unity); Use of appropriate linkers/connectives; Focus on cause, effects, comparison, definition, classification problem/ solution, process, argument.

3.3 Email-Etiquette.

3.4 Letter Writing.

UNIT-4 4.0 Vocabulary Building and Grammar (3hrs)

4.1**Vocabulary Building:** Synonyms, Antonyms, One-word substitutes; Words often Confused; Idioms.

4.2 **Functional Grammar**: Tense and Aspect; Subject-Verb agreement

UNIT-5 5.0 Reading for appreciation of literary texts (8hrs)

1.1 **Prose text**- Yesterday was Beautiful by Roald Dahl

5.2 **Poem**- Defeat by Kahlil Gibran

Prescribed textbook for theory:

Technical communication - Principles and Practice (2nd Edition 2014) - Meenakshi Raman and Sangeeta Sharma- Oxford University Press.

Learning Resources:

1. Paul V. Anderson – Technical Communication
2. E.Suresh Kumar, P. Sreehari and J. Savithri - Essential English
3. Reading comprehension - Nuttal.J.C - Orient Blackswan
4. SunithaMishra,C. Murali Krishna, Communication Skills for Engineers, Pearson, 2004.
5. M. Ashraf Rizvi. Effective Technical Communication. Tata McGraw Hill, 2005.
6. Allen and Waters. How English Works.
7. Willis Jane., English through English.
8. Brown, Penelope and Stephen C. Levinson. 1978. Universals in language usage: Politics phenomena; Cambridge University Press

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	02	Max. Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF MATHEMATICS

DIFFERENTIAL EQUATIONS & VECTOR CALCULUS
(Common to Civil, EEE, ECE, Mech.)
SYLLABUS FOR B.E II – SEMESTER

L:T:P(Hrs/week): 3	SEE Marks: 60	Course Code: U25BS210MA
Credits : 03	CIE Marks: 40	Duration of SEE: 03Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to :	At the end of the course students should be able to:
1. Understand the fundamental concepts and solution of first-order Differential Equations, as well as their applications in modeling real-world phenomena. 2. Develop the ability to solve homogeneous and non-homogeneous Linear differential equations with constant coefficients, and their applications to LCR circuits. 3. Study the concepts of vector differentiation, Directional derivative, Divergence and Curl of a vector point function. 4. Learn the concepts of evaluation of double integrals and changing the order of integration. 5. Understand the concepts Improper integrals Beta, Gamma functions and their properties.	1. Solve various types of first-order Differential Equations, model and analyze physical systems such as LR circuit and find orthogonal trajectories of Cartesian curves. 2. Solve homogeneous and non-homogeneous Linear differential equations with constant coefficients, including those arising in LCR circuits. 3. Find the gradient of a scalar point function, divergence and curl of vector field and its applications. 4. Evaluate the double integrals and also evaluate the double integrals by changing the order of integration and by change of variables. 5. Evaluate Improper integrals using Beta, Gamma functions.

UNIT – I (08 classes)

ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER

Exact differential equations - Integrating factors - Clairaut's equation - Applications: Orthogonal trajectories (Cartesian families) - LR Circuit.

UNIT – II (08 classes)

HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS

Solutions of Homogeneous and Non-Homogeneous linear equations of the form f(D)y = r(x) with constant coefficients $[\text{Where } r(x) = e^{ax},\ \sin(ax+b)(\text{or})\cos(ax+b),\ x^k,\ e^{ax}V(x)]$ - Method of Variation of Parameters- LCR circuits.

UNIT – III (08 classes)

VECTOR CALCULUS

Scalar and Vector point function and their derivatives - Level Surface - Gradient of a scalar point function - Normal to a level surface - Directional Derivative – Divergence and Curl of a Vector Field – Solenoidal and Irrotational vectors - Conservative vector field.

UNIT – IV (08 classes)

DOUBLE INTEGRALS

Double integrals (Cartesian) - Change of order of integration (Cartesian Coordinates) - Change of the Variables (Cartesian to Polar Coordinates in two dimensions).

UNIT – V (08 classes)

SPECIAL FUNCTIONS

Definition of Improper Integrals- Beta function - Gamma function - Relations between Beta & Gamma function - Properties of Beta and Gamma functions.

Learning Resources:

1. Advanced Engineering Mathematics 3rd Edition, R.K.Jain & S.R.K.Iyengar, Narosa Publishing House.
2. Higher Engineering Mathematics 40thEdition Dr. B.S Grewal, Khanna Publishers.
3. A Text book of Engineering Mathematics, N.P. Bali& Manish Goyal, Laxmi Publications.

Reference Books:

1 Advanced Engineering Mathematics, by Wylie & Barrett, Tata Mc Graw Hill, New Delhi.

2 Advanced Engineering Mathematics, 8th Edition by Erwin Kreyszig, John Wiley & Sons, Inc.

3 Complex Variables and applications, J.W.Brown and R.V.Churchill, 7th Edition, Tata Mc Graw Hill, 2004.

Online Resources :

1. https://onlinecourses.swayam2.ac.in/cec24_ma09/preview
2. https://onlinecourses.nptel.ac.in/noc24_ma03/preview

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	02	Max. Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: **90 Minutes**

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF PHYSICS

ENGINEERING PHYSICS
SYLLABUS FOR B.E.II-SEMESTER

L:T:P(Hrs/week): 2:0:0	SEE Marks: 60	Course Code: U25BS230PH
Credits :02	CIE Marks: 40	Duration of SEE: 90 MIN.

CO code	Course Objectives	Course Outcomes	Highest BTL
BS230PH.1	• To describe characteristics of acoustics quieting effects required for a hall.	• To interpret acoustics of a hall and suggest good building acoustics	3
BS230PH.2	• To comprehend lasing action and state application of lasers	• To compare different types of lasers and identify their utilization in mechanical engineering sector	3
BS230PH.3	• To grasp basic principles of liquefaction of gasses	• To summarize liquefaction of gases and their applications in various fields.	3
BS230PH.4	• To acquire basic knowledge on nanomaterials and their applications	• To interpret characterization of nanomaterial and summarize their applications.	2

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	3	3	-	-	-	-	-	-	-	-	-	-	1
CO2	3	3	-	-	-	-	-	-	-	-	-	-	1
CO3	3	3	-	-	-	-	-	-	-	-	-	-	1
CO4	3	3	-	-	-	-	-	-	-	-	-	-	1

UNIT-I: ACOUSTICS (10 hours)

Architectural Acoustics: classification of sound: musical sound and noise, Characteristics of musical sound: pitch, loudness, timbre, sound intensity, reverberation time, absorption coefficient, Sabine's formula, sound absorbent materials, conditions for acoustic quieting: effects and remedies.

Ultrasonics: properties of ultrasonics, types of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction method, detection of ultrasonics by piezoelectric, thermal detector, applications of ultrasonics: SONAR, Ultrasonic non-destructive testing.

UNIT-II: LASERS AND OPTICAL FIBRES (10 hours)

Lasers: Induced absorption, spontaneous and stimulated emissions, Properties

of laser light, population inversion, meta-stable states, pumping mechanisms, components of laser, construction and working of Ruby laser, applications of lasers in mechanical engineering.

Optical Fibers: introduction to optical fibers, expression for numerical aperture, acceptance angle, types of optical fibers, signal losses in optical fibers: Attenuation-absorption, bending and alignment losses, Block diagram of optical communication system, application of optical fibers in mechanical engineering.

UNIT-III: CRYOGENICS (10 hours)

Introduction to low temperature Physics- Joule Thomson effect, porous plug experiment, J-T effect for a Van der Waal's gas, Inversion temperature, Boyle temperature and critical temperature. Regenerative cooling process, Liquefaction of hydrogen, properties of liquid helium, adiabatic demagnetization, thermal and mechanical properties of materials at cryogenic temperatures, superconductivity, Applications of cryogenic liquids.

UNIT-IV: NANOMATERIALS (10 hours)

Nanoscale, Nanoscience and nano technology, distinction between bulk, thin films and nanomaterials, quantum confinement, surface to volume ratio, quantum wires, quantum wells, and quantum dots, properties of nanomaterials, bottom-up and top-down approaches: sol-gel and Ball milling techniques, block diagrams of Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM) and Atomic Force Microscope (AFM). Engineering applications of nano materials.

Learning Resources:

1. M.N. Avadhanulu and P.G. Kshirsagar and TVS Arun Murthy, A Textbook Engineering Physics, 11th edition, S. Chand, 2019.
2. Mamata Mukhopadhyay, Fundamentals of Cryogenics Engineering, 3rd ed PHI, 2016
3. S O Pillai, Solid State Physics, 8th edition, New Age International Publishers, 2018
4. Nanotechnology: Principles and Practices" by Sulabha K. Kulkarni, 3rd edition, 2015

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	02	Max. Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING MECHANICS - DYNAMICS

SYLLABUS FOR B.E. II-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks: 60	Course Code: U25ES230CE
Credits: 3	CIE Marks: 40	Duration of SEE: 3Hrs

Course Objectives	Course Outcomes
Objectives of this course are to:	At the end of the course, students will be able to:
1. Understand the concepts of dynamics and its principles. 2. Explain kinetics and kinematics of particles, projectiles, curvilinear motion, fixed axis rotation of rigid bodies. 3. Impart the concepts of work-energy method and its applications to translation, rotation. 4. Explain the concepts of virtual work method for equilibrium for particle and rigid bodies along with mechanical efficiency. 5. Impart the concept of impulse momentum relation	1. Distinguish between statics and dynamics and differentiate between kinematics and kinetics. 2. Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion. 3. Solve problems using work energy equations for translation, fixed axis rotation. 4. Solve the problems using virtual work method and able to know its applications and limitations. 5. Solve problems using impulse momentum equation

UNIT–I: Kinematics: Rectilinear motion, Curvilinear motion, Projectile motion, Velocity and acceleration, Types of rigid body motion-Fixed axis rotation.

UNIT-II: Kinetics: Analysis as a particle, Analysis as a rigid body in translation, Fixed axis rotation.

UNIT –III: Work Energy: Principles of work-energy and its application to translation, Fixed axis rotation.

UNIT-IV: Virtual Work Method: Principles of Virtual work, Applications and limitations, equilibrium for particle and rigid bodies along with mechanical efficiency.

UNIT-V: Impulse and momentum: Introduction, linear impulse-momentum, principle of conservation of linear momentum, loss of kinetic energy.

Learning Resources:

1. Singer F.L "Engineering Mechanics", Harper & Collins, Singapore, 3rd Edition 2023.
2. Timoshenko S.P and Young, "Engineering Mechanics (SI Units)", McGraw Hill, 5th edition.2013.
3. Andrew Pytel, JaanKiusalaas, "Engineering Mechanics", Cengage Learning, 4th edition, 2016.
4. Beer F.P & Johnston E.R Jr. "Vector Mechanics for Engineers", TMH, 12th edition, 2019.
5. Hibbeler R.C Sharma D P & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2012.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
7. Basudeb Bhattacharyya, "Engineering Mechanics", Oxford University Press,2nd edition, 2014.
8. Meriam. J. L., "Engineering Mechanics", Volume-II Dynamics, John Wiley & Sons, 4th edition, 2008.
9. NPTEL Course (www.nptel.ac.in)
10. Virtual labs (www.vlab.co.in)

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING DRAWING-II

SYLLABUS FOR B.E. II SEMESTER

L:T:P (Hrs./week): 1:0:2	SEE Marks: 60	Course Code: U25ES220CE
Credits: 2	CIE Marks: 40	Duration of SEE: 3Hrs

Course Objectives	Course Outcomes
Objectives of this course are to:	At the end of the course, students will be able to:
1. Explain the principles involved in Section of simple solids 2. Develop surfaces of simple solids 3. Explain intersection of cylinder with cylinder and cylinder with cone 4. Differentiate between isometric view and isometric projection 5. Draw orthographic views from pictorial views	1. Draw sectional views of simple solids 2. Develop the lateral surfaces of simple solids 3. Prepare orthographic views of intersection of solids. 4. Visualize isometric view of simple planes, solids and combined solids 5. Construct orthographic views of simple objects from their pictorial views

UNIT-I: Sections of Solids: True shape of sections, sections of prisms, pyramids, cylinders and cones (axis perpendicular to HP and VP only).

UNIT-II: Development of Surfaces: Basic concepts of development of surfaces, Methods of development – Parallel line development and radial line development, Development of prisms, pyramids, Cylinders and cones.

UNIT-III: Intersection of Surfaces: Intersection of cylinder and cylinder, cylinder and cone.

UNIT–IV: Isometric Projections: Isometric scale, Isometric projections of prisms, pyramids, cylinders, cones, spheres, and combinations of two or three solids.

UNIT-V: Conversion of Isometric Views to Ortho-graphic views: Drawing orthographic views from Isometric views for simple objects.

Learning Resources:

1. Bhatt N.D. "Elementary Engineering Drawing", Charotar Publishers, 54th edition, 2023.
2. Thomas E French, Charles J Vierck, Robert J. Foster, "Engineering Drawing and Graphic Technology", McGraw Hill Education, 2012.
3. Gill P.S. "Engineering Drawing: Geometrical Drawing", S K Kataria & sons, 2012.
4. Venugopal.K "Engineering Drawing and Graphics Plus Autocad", New Age International (P)Ltd., New Delhi,2010.
5. Siddiquee A.N "Engineering Drawing with a Primer on AUTOCAD", Prentice hall of India Ltd., New Delhi, 2004.
6. Basanth Agrawal, Agrawal C.M "Engineering Graphics " First Edition, Tata Mc Graw Hill,2012
7. BVR Gupta, M Raja Roy, "Engineering Drawing with AutoCAD", IKIntPvt Ltd, 2009.
8. NPTEL Course (www.nptel.ac.in)
9. Virtual labs (www.vlab.co.in)

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Mechanical Engineering

THERMODYNAMICS

SYLLABUS FOR B.E.II-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: U25PC210ME
Credits :03	CIE Marks:40	Duration of SEE:03Hours

Course Objectives	Course Outcomes
The prime objective of the course is to dwell into the transition of heat and work across a thermodynamic system and the basic governing laws of thermodynamics.	On completion of the course, the student will be able to: 1. Apply the basic knowledge of thermodynamics to determine the state properties. 2. Estimate the energy transfers by applying the first law of thermodynamics to closed system (control mass) and open system (control volume). 3. Analyze the problems on heat engines, refrigerators and entropy by applying the second law of thermodynamics to various systems and processes. 4. Estimate the thermodynamic properties of pure substances by using property tables and Mollier Diagram 5. Evaluate the performance of air standard cycles and Rankine vapour power cycle that form the basis for various thermal prime movers.

CO-PO and CO-PSO mapping															
CO	PO mapping												PSO mapping		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	1	1	1							1	3	2	2
CO2	3	2	2	2	1							1	3	2	2
CO3	3	3	2	2	1							1	3	2	2
CO4	3	3	2	2	1							1	3	2	2
CO5	3	2	3	2	1							1	3	2	2

UNIT– I: Basics of Thermodynamics

Concepts of system: control mass and control volume; Macroscopic and Microscopic approaches; thermodynamic properties, thermodynamic state, process and cycle, quasi-static process, thermodynamic equilibrium; energy, pressure and temperature; ideal gas; the Zeroth law of thermodynamics.

UNIT – II: First law of Thermodynamics

Definition of Work and Heat; Joule's experiment; first-law to a control mass undergoing a process; Energy as property of system; internal energy, enthalpy and specific heat; conservation of mass and energy to a control volume; steady flow energy equation (SFEE): applications; PMM-1.

UNIT – III: Second law of Thermodynamics

Reversible and irreversible processes; heat engine, heat pump and refrigerator; Carnot cycle; performance parameters (efficiency and COP); Kelvin–Planck and Clausius statements; PMM-2, Clausius inequality; entropy as a property; entropy change in a process, T–s diagram; principle of entropy increase.

UNIT – IV: Properties of Pure Substances

Definition of Pure substance and phase, Concept of phase change, vapour-liquid-solid phase equilibrium of pure substances; P-T, P-v, T-s, h-s and T-v diagrams; estimation of properties using thermodynamic tables and Mollier chart.

UNIT– V: Power cycles

Air standard cycles: Otto and Diesel cycles [Concepts and Derivations], Dual and Brayton Cycles [concepts only]; work done, air standard efficiency of gas power cycles; simple Rankine cycle.

Learning Resources:

1. R.E. Sonntag, C. Borgnakke & G.J. Van Wylen, "Fundamentals of Thermodynamics", 6th edition, John Wiley Publications, 2015
2. P.K. Nag, "Engineering Thermodynamics", 5th edition, McGraw Hill Education, 2014.
3. Y. Cengel & M. Boles, "Thermodynamics an Engineering approach", 7th Edition, McGraw Hill, 2011.
4. P.L. Ballaney, "Thermal Engineering", 25thedition, Khanna Publishers, 2015.
5. ISI Steam Tables in SI units, Indian Standards Institution, New Delhi, SP:26-1983.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	02	Max. Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: **90 Minutes**

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of H & SS

LEARNING TO LEARN

SYLLABUS FOR B.E.II-SEMESTER

L:T:P(Hrs/week):1:0:0	SEE Marks:40	Course Code: U25HS040EH
Credits : 1	CIE Marks:30	Duration of SEE: 02Hours

COURSE OBJECTIVE *The objective of the course is to*	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1. Understand the importance of a growth mindset and personal learning styles. 2. Learn techniques to improve memory retention and focus for effective learning. 3. Develop practical time management skills to prioritize tasks effectively. 4. Help students understand questions, structure answers effectively, and manage time for improved exam performance.	1. Students will be able to adopt a growth mindset and customize learning strategies based on their strengths. 2. Students will apply mnemonic devices, active recall, and focus strategies to enhance their learning process. 3. Students will implement time-blocking and prioritization techniques for better productivity. 4. Students will apply strategies to interpret questions and write clear, effective answers within time limits.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															

Overview:

In an era shaped by rapid change and evolving technologies, the ability to learn continuously is a core skill for personal and professional success. This course is designed to help engineering students become self-directed, adaptable learners. By exploring mindset, memory techniques, focus strategies, time management, and reflection, students will develop learning habits that support lifelong growth and workplace readiness.

UNIT 1: Foundations of Learning
Builds a strong base for lifelong learning through mindset, self-awareness, and personal learning styles.

1.1 Growth Mindset
1.2 Understanding Learning Styles
1.3 Overcoming Procrastination

Learning Outcomes:

- Cultivate a growth mindset to embrace challenges and persist in learning
- Identify personal learning preferences and adapt strategies accordingly
- Recognize and overcome common learning barriers like procrastination

UNIT 2: Memory and Focus
Equips students with practical strategies to improve attention and information retention.

2.1 Techniques for Focus and Attention
2.2 Spaced Repetition and Active Recall
2.3 Mind Mapping for Retention

Learning Outcomes:
- Practice focused learning using tools like Pomodoro and distraction management
- Enhance memory with scientifically supported methods like spaced repetition and recall
- Use visual techniques such as mind maps to organize and retain complex content

UNIT 3: Managing Time Effectively
Enables students to manage academic and personal responsibilities through smart scheduling and prioritization.

3.1 Prioritization (Eisenhower Matrix)
3.2 Time Management Tools
3.3 Balancing Academics and Personal Goals

Learning Outcomes:

- Prioritize tasks using structured models for better academic planning
- Use digital or physical tools to track goals, deadlines, and productivity
- Design a sustainable routine that aligns academic success with well-being

UNIT 4: Strategic Exam Skills Decoded

Focuses on building strategic approaches to tackle exams effectively, with emphasis on comprehension, answer structuring, and time-bound performance.

4.1 Understanding the Question

4.2 Structuring the Answer

4.3 Customizing Answers for Impact

Learning Outcomes:

- Interpret exam questions accurately and identify the expected response type and depth.
- Construct well-structured, relevant answers tailored to the marks and keywords in the question.
- Recognize and eliminate common answer-writing errors like digression and unnecessary detail.

Learning Resources:

1. Mindset: The New Psychology of Success by Carol S. Dweck
2. Make It Stick: The Science of Successful Learning by Peter C. Brown, Henry L. Roediger III, and Mark A. McDaniel
3. Eat That Frog! by Brian Tracy
4. How to Write Better Essays by Bryan Greetham
5. learn.talentsprint.com

The break-up of CIE: Internal Tests+Assignments + Quizzes

1	No. of Internal Tests:	01	Max.Marks for each Internal Test:	20
2	No. of Assignments:	01	Max. Marks for each Assignment:	05
3	No. of Quizzes:	01	Max. Marks for each Quiz Test:	05

Duration of Internal Test: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
Department of Humanities and Social Sciences

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB
SYLLABUS FOR B.E.II-SEMESTER

L:T:P(Hrs/week): 0:0:2	SEE Marks: 50	Course Code: U25HS011EH
Credits : 01	CIE Marks: 30	Duration of SEE: 03 Hours

Course Objective *The objective of the course is to*	**Course Outcomes** *On completion of the course, students will be able to*
1. Understand the fundamentals of English phonetics, including sound classification and pronunciation of commonly mispronounced and foreign words. 2. Enhance listening comprehension and ear training through stress, intonation, and exposure to historical speeches and pronunciation patterns. 3. Develop effective public speaking and presentation skills by analysing model speeches and practicing structured delivery techniques. 4. Build collaborative communication abilities through group discussions, focusing on initiation, continuation, and closure strategies. 5. Strengthen reading comprehension and analytical skills, including paraphrasing and summarizing, using diverse reading strategies and text types.	1. Accurately identify and pronounce English consonant and vowel sounds, including words with silent letters and foreign-origin terms used in English. They will also demonstrate improved listening and speech recognition skills through analysis of famous speeches and application of intonation and stress patterns. 2. Deliver structured public speeches and group presentations confidently, adhering to best practices for content and visual aid usage. They will engage effectively in group discussions, displaying clarity of thought, respect for others' opinions, and logical progression. 3. Apply advanced reading techniques (e.g., SQ3R, scanning, skimming) to comprehend, paraphrase, and summarize content from diverse sources including technical and journalistic texts.

1.0 PHONETICS LAB- TOPICS

1.1 Introduction to English Phonetics:

Classification of consonants and vowel sounds and related symbols. Pronunciation of commonly mispronounced words. Pronunciation of Foreign words in English.

1.2 **Aspects of language learning and ear training activities-**.
Word stress and intonation, Pronunciation of silent letters and Foreign words used in English Longman Dictionary of contemporary English- 6th Edition, 2020. Listening to famous speeches from history followed by while listening and post listening exercises.

2.0 INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS

2.1 **Public speaking:**
Dos and don'ts of public speaking. Listening and analysing speeches of great personalities in history, TED talks, Documentaries and Movies.

2.2 **Presentation Skills:**
Dos and Don'ts of power point presentations, group presentations (branch specific topics)

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

3.0 READING SKILLS LAB - TOPICS

3.1 Sub-skills of reading - SQ3R – skimming, scanning, extensive and intensive reading.
3.2 Teaching different types of texts for comprehension-short stories and technical articles.
3.3 Newspaper reading and paraphrasing/summarising.
Interview skills: For Practical examinations and general HR interviews.

Prescribed textbook for laboratory:

1. Speak Well: Jayshree Mohanraj, Kandula Nirupa Rani and Indira Babbellapati - Orient Black Swan
2. Longman Dictionary of Contemporary English – 6th Edition, 2020.(The students will be given the PDF format)

Learning Resources:

1. Balasubramanian: A textbook of English phonetics for Indian students, Macmillan, 2008.
2. Priyadarshini Patnaik : Group discussion and interviews, Cambridge University Press India private limited 2011.
3. Daniel Jones: Cambridge English Pronouncing Dictionary - A Definitive guide to contemporary English Pronunciation.
4. Reading Cards (Eng400): Orient Black Swan. Reading Squabble - Hadfield.

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2 Hours			

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
Department of Physics

ENGINEERING PHYSICS LAB
SYLLABUS FOR B.E.II-SEMESTER
(Common to Mechanical and Civil Branches)

L:T:P(Hrs/week): 0:0:2	SEE Marks: 50	Course Code: U25BS211PH
Credits : 01	CIE Marks: 30	Duration of SEE: 03 Hours

Course Objectives	Course Outcomes	BTL
1. to study and discuss the characteristics of a given device	1. to conduct experiment independently and in team to record the measurements	2
2. to identify probable errors and take in the readings and known possible precautions	2. to outline the precautions required to be taken for each experiment	1
3. to compare the experimental and theoretical values and draw possible conclusions.	3. to Compare the experimental results with standard values and estimate errors percentage	2
4. To interpret the results from the graphs drawn using experimental values.	4. to draw graphs and interpret the results with respect to graphical and theoretical values	2
5. To write the record independently with appropriate results.	5. To effectively write summary of the experiment and draw appropriate conclusions	1

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	3	1	-	-	-	-	-	-	2	-	-	1	3
CO2	3	1	-	-	-	-	-	-	-	-	-	1	3
CO3	3	2	-	-	-	-	-	-	-	-	-	1	3
CO4	3	1	-	-	-	-	-	-	-	-	-	1	3
CO5	3	1	-	-	-	-	-	2	-	-	-	1	3

1. Determination of moment of inertia of a Fly Wheel
2. Computation of rigidity modulus of material of a wire using Torsional Pendulum
3. Estimation of frequency of electrically maintained Tuning fork- Melde's experiment.
4. Determination of radius of gyration and acceleration due to gravity using Compound Pendulum.

5. Assessment of velocity of ultrasonic waves in liquids
6. Calculation of wavelength of laser light & Estimation of distance by laser light source
7. Measurement of radius of curvature of a Plano-convex lens by forming Newton's Rings.
8. Determination of wavelengths of mercury vapour lamp- diffraction grating
9. Calculation of numerical aperture, acceptance angle and power loss due to bending of an optical fibre.
10. Study of I-V characteristics of P-N Junction diode.
11. Gyroscope- study of gyroscopic effects.

The break-up of CIE:

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2 Hours			

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Mechanical Engineering

ENGINEERING WORKSHOP-II

SYLLABUS FOR B.E.II-SEMESTER

L:T:P(Hrs/week): 0:0:2	SEE Marks: 50	Course Code: U25ES211ME
Credits : 01	CIE Marks: 30	Duration of SEE: 03Hours

COURSE OBJECTIVES *The course will enable the students to*	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 know basic workshop processes, adopt safety practices while working with various tools 2 identify, select and use various marking, measuring, holding, striking and cutting tools &equipment.	1 create models in Electrical and electronics, Welding, fitting and Machining trades by using the relevant 2 tools. measure and inspect the finished components using 3 suitable measuring instruments. model engineering components, prepare and slice STL files with appropriate process parameters, and 4 fabricate 3D printed parts followed by post-processing. document the observations and procedure in the record.

List of the Experiments:

WELDING

1. Bead formation using arc welding
2. Butt joint & T joint using arc welding
3. Lap joint using gas welding`

3D PRINTING

1. Introduction to 3D Printing, modeling of engineering component.
2. Slicing of STL File and setting of process parameters.
3. Printing of 3D component and post processing.

FITTING

1. Template fitting (square fit)
2. V- groove fit
3. Drilling and Tapping

MACHINING

1. Plain turning and step turning
2. Taper turning
3. Thread cutting

ADDITIONAL EXPERIMENTS

1. Electrical & Electronics: LT Distribution with loads (Demo)
2. Welding: Spot welding (demo)
3. Fitting: Assembly of pulley on a shaft with key (demo)
4. Machining: Additive manufacturing (demo)

Learning Resources:

1. Hajra Choudhury S.K., Hajra Choudhury A.K., Nirjar Roy S.K. "Elements of Workshop Technology" Vol-I 2008 & Vol-II 2010 Media Promoters & Publishers Pvt. Limited, Mumbai.
2. Kalpakjian S. and Steven R. Schmid, "Manufacturing Engineering and Technology" 4th Edition, Pearson Education India, 2002.
3. Gowri P., Hariharan and Suresh Babu A., "Manufacturing Technology-I", Pearson Education 2008.
4. P. Kannaiah& K. L. Narayana "Workshop manual" 2nd Ed., Scitech publications (I) Pvt. Ltd., Hyderabad.
5. B.L. Juneja, "Workshop Practice", Cengage Learning India Pvt. Limited, 2014.
6. www.technologystudent.com
7. www.mewelding.com

The break-up of CIE:

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2 Hours			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-25)
BE (MECHANICAL ENGINEERING) II-SEMESTER AY 2025-2026
(Students Admitted in 2025-26)

SERVICE COURSES OFFERED BY MECHANICAL ENGINEERING DEPARTMENT

B.E II Semester								
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
PRACTICALS (ECE)								
U25ES011ME	Engineering Workshop	-	-	2	3	50	30	1
PRACTICALS (EEE)								
U25ES021ME	Workshop Practice	-	-	2	3	50	30	1

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
Department of Mechanical Engineering

ENGINEERING WORKSHOP
SYLLABUS FOR B.E. II-SEMESTER (AY 2025-26)
(for ECE)

L:T:P(Hrs/week): 0:0:2	SEE Marks: 50	Course Code: U25ES011ME
Credits : 01	CIE Marks: 30	Duration of SEE: 03 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. know basic workshop processes, adopt safety practices while working with various tools 2. identify, select and use various marking, measuring, striking holding, and cutting tools & equipment.	At the end of the course, students will be able to: 1. Construct models related to carpentry, fitting, and sheet metal trades using appropriate tools and techniques. 2. Measure and inspect finished components accurately using suitable measuring instruments. 3. Apply basic electrical and electronics engineering concepts to design and assemble simple electrical circuits, verify their functionality, and perform component soldering with proper safety and technique.

CO-PO/PSO Mapping

CO-PO MAPPING FOR APPLIEDCHEMISTRY												
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	3	2	-	-	-	-	-	-	-	-	-
2	3	2	1	-	-	-	-	-	-	-	-	-
3	3	1	2	-	-	-	-	-	-	-	-	-

List of the Experiments:

FITTING
1. Template fitting (square fit)
2. V-groove fit
3. Drilling and Tapping

ELECTRICAL & ELECTRONICS:

1. Two lamps in(a)series(b) parallel with 3 pin plug and switches
2. Staircase wiring and Tube light wiring
3. (a) Identification of electronic components
   (b) Soldering practice

CARPENTRY:

1. Half-lap joint
2. Dove-tail joint
3. Bridle joint

SHEET METAL:

1. Rectangular box
2. Rectangular scoop with handle
3. Making a funnel with soldering

Additional Experiments

2. Fitting: Assembly of pulley on a shaft with key (demo)
3. Electrical & Electronics: LT Distribution with loads (Demo)
4. Carpentry: Wood turning operation (demo)
5. Sheet Metal: Making a T-Joint (Demo).

Learning Resources:

1. Hajra Choudhury S.K., Hajra Choudhury A.K., Nirjar Roy S.K. "Element of Workshop Technology" Vol-I 2008 & Vol-II 2010 Media Promoters & Publishers Pvt. Limited, Mumbail
2. Kalpakjian S. and Steven S. Schmid, "Manufacturing Engineering and Technology" 4th Edition, Pearson Education India Edition, 2002.
3. Gowri P., Hariharan and Surech Babu A., "Manufacturing Technology-I", Pearson Education 2008.
4. P. Kannaiah & K.L. Narayana "Workshop manual" 2nd Ed., Scitech publications (I) Pvt. Ltd., Hyderabad.
5. B.L. Juneja, "Workshop Practice", Cengage Learning India Pvt. Limited, 2014.
6. www.technologystudent.com

The break-up of CIE : Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	1
2	Max. Marks for internal tests	:	12
3	No. of Quizzes Marks for day-to-day laboratory class work	:	18

Duration of Internal Test: 2 Hours

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WORKSHOP PRACTICE
SYLLABUS FOR B.E. I SEMESTER (AY 2025-26)
(for EEE)

L:T:P(Hrs/week):0:0:2	SEE Marks:50	Course Code:U25ES021ME
Credits :01	CIE Marks:30	Duration of SEE:03Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. know basic workshop processes, adopt safety practices while working with various tools 2. identify, select and use various marking, measuring, striking holding, and cutting tools & equipment.	At the end of the course, students will be able to: 1. Construct models related to carpentry, plumbing and welding trades using appropriate tools and techniques. 2. Measure and inspect finished components accurately using suitable measuring instruments. 3. Apply basic electrical and electronics engineering concepts to design and assemble simple electrical circuits, verify their functionality, and perform component soldering with proper safety and technique.

List of the Experiments:

ELECTRICAL & ELECTRONICS:
1. Two lamps in(a)series(b) parallel with 3 pin plug and switches
2. Staircase wiring and Tube light wiring
3. (a) Identification of electronic components
   (b) Soldering practice

CARPENTRY:
1. Half-lap joint
2. Dove-tail joint
3. Bridle joint

PLUMBING:

1. Introduction of tools, joints, couplings and valves etc.
2. Pipe thread cutting and making single joint with coupling and tap connection.
3. Water shower connection with reducer coupling

WELDING

1. Bead formation using arc welding
2. Butt joint & T joint using arc welding
3. Lap joint using gas welding`

ADDITIONAL EXPERIMENTS

1. Electrical & Electronics: LT Distribution with loads (Demo)
2. Carpentry: Wood turning operation (demo)
3. Demonstration of 3D printing of a component
4. Welding: Spot welding (demo)

Learning Resources:

1. Hajra Choudhury S.K., Hajra Choudhury A.K., Nirjar Roy S.K. "Element of Workshop Technology" Vol-I 2008 & Vol-II 2010 Media Promoters & Publishers Pvt. Limited, Mumbail
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