

**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-23)**  
**WITH EFFECT FROM 2023-24**  
**(For the students admitted in 2023-24)**



**DEPARTMENT OF MECHANICAL ENGINEERING**

**+91-40-23146060, 23146061**

**Fax: +91-40-23146090**

**Website: [www.vce.ac.in](http://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*

<b>PROGRAM OUTCOMES (POs)</b>	
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-23)****B.E. – MECH : FIRST SEMESTER (2023-2024)**

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									
U23BS110MA	Matrices & Calculus	3		-	3	60	40	3	
U23BS120CH	Applied Chemistry	3	-	-	3	60	40	3	
U23ES110CE	Basic Engineering Mechanics	3	-	-	3	60	40	3	
U23ES110EE	Basic Electrical and Electronics Engineering	3	-	-	3	60	40	3	
U23ES120CE	Engineering Drawing-I	1	-	2	3	60	40	2	
U23HS020EH	Human Values and Professional Ethics-I	1	-	-	2	40	30	1	
U23MC010CE	Environmental Science	2	-	-	3	60	40	0	
PRACTICALS									
U23BS011CH	Chemistry Lab	-	-	2	3	50	30	1	
U23ES111ME	Engineering Workshop-I	-	-	2	3	50	30	1	
U23ES111EE	Basic Electrical and Electronics Engineering Lab	-	-	2	3	50	30	1	
TOTAL		16	-	8	-	550	360	18	
GRAND TOTAL		24			-	910		18	
1) Student should complete one NPTEL certification course equivalent to 2 credits (8 weeks) by the end of VI 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 : U23BS110MA
Credits : 3	CIE Marks: 40	Duration of SEE: 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	At the end of the course students should be able to:
<ol style="list-style-type: none"> <li>1. Study the concepts of rank of a matrix, System of linear equations and LU-Decomposition method.</li> <li>2. Learn the concepts of Eigen values and Eigen vectors, Diagonalization of a matrix</li> <li>3. Understand the concepts of curvature, radius of curvature, evolutes and to expand functions using Taylor's series.</li> <li>4. Acquire the knowledge of partial derivatives and expand functions of two real variables using Taylor's series and maxima - minima.</li> <li>5. Identify the nature of an infinite series using various tests.</li> </ol>	<ol style="list-style-type: none"> <li>1. Find the rank of a given matrix and solution of a system by LU-Decomposition method.</li> <li>2. Apply the similarity transformation to diagonalize a matrix.</li> <li>3. Compute the radius of curvature, evolute of a given curve and to expand given function using Taylor's series.</li> <li>4. Expand the given function in terms of Taylor's series and find the maxima and minima of functions of several variables also using Lagrange's method of multipliers.</li> <li>5. Apply an appropriate test to check the nature of an infinite series.</li> </ol>

**UNIT-I (10 classes)**

**MATRICES-I**

Rank of a Matrix- Echelon form - Normal Form - Linearly Dependence and Independence of Vectors- Consistency and Inconsistency of Homogeneous and Non-Homogeneous system of linear equations – LU-Decomposition method.

**UNIT –II (10 classes)**

**MATRICES-II**

Characteristic equation- Eigen values and Eigenvectors - Cayley - Hamilton Theorem (without proof) - Diagonalization using Similarity Transformation- 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 (12 classes)**

#### **MULTIVARIABLE 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**

Definition of Sequence, Convergence of sequence. Series – Convergence and Divergence- Series of positive terms-Geometric series- P-series test - Comparison tests – Limit comparison test-D'Alemberts Ratio Test – Cauchy's root test - Alternating Series – Leibnitz test – Absolute and Conditional 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 40<sup>th</sup>. Edition, Khanna Publishers.

#### **Reference Books:**

- 1 Advanced Engineering Mathematics 8<sup>th</sup> 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 <http://mathworld.wolfram.com/topics>
- 2 <http://www.nptel.ac.in/course.php>
- 3 <https://www.coursera.org/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 CHEMISTRY****APPLIED CHEMISTRY****SYLLABUS FOR B.E I – SEMESTER**

Instruction : 3Hrs / week	SEE Marks:60	Course Code : U23BS120CH
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hours

<b>COURSE OBJECTIVES:</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	At the end of the course students should be able to:
<ol style="list-style-type: none"> <li>1. Study types of conductance, variation of electrode potential and EMF and to acquaint with applications of Galvanic Cell.</li> <li>2. Classify and compare various types of batteries and fuel cells.</li> <li>3. Get acquainted with different types of polymers and their applications.</li> <li>4. Emphasize upon the quantity and quality of fossil fuels and need for bio-diesel</li> <li>5. Describe the requirements of water for domestic and industrial uses.</li> </ol>	<ol style="list-style-type: none"> <li>1. Construct a galvanic cell and calculate its EMF and pH wherever applicable.</li> <li>2. Describe the construction, functioning and applications of the selected primary, secondary batteries and fuel cells.</li> <li>3. Classify the polymers and discuss the synthesis and applications of few polymers.</li> <li>4. Rate the fuels and suggest methods for enhancement of the quality of fuels for the required output.</li> <li>5. Suggest appropriate treatment methods of water to make it fit for domestic and industrial applications.</li> </ol>

**CO-PO MAPPING FOR APPLIED CHEMISTRY**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	2	-	-	-	-	-	-	-	-	-	1
2	3	2	-	-	-	-	2	-	-	-	-	2
3	3	2	-	-	-	-	2	-	-	-	-	2
4	3	2	-	-	-	-	2	-	-	-	-	2
5	3	2	-	-	-	-	2	-	-	-	-	2

**UNIT-I: ELECTROCHEMISTRY (11)**

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

Cells – electrolytic and electrochemical cells. IUPAC convention of cell notation, cell reaction, concept of electrode potential, electro motive force (EMF). Electrochemical series – applications, 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.

## **UNIT-II: BATTERY TECHNOLOGY (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<sub>2</sub>O battery and lithium-V<sub>2</sub>O<sub>5</sub> 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: POLYMER CHEMISTRY (12)**

Introduction, degree of polymerization, functionality of monomers and its effect on the structure of polymers. Classification of polymers – a) homo and co-polymers; b) homo chain and hetero chain polymers; c) plastics, elastomers, fibers and resins.

Types of Polymerizations – Addition and condensation polymerization.

Glass transition temperature and factors affecting glass transition temperature.

**Plastics:** Thermo plastics and thermosets – preparation, properties and applications of a) Aramid (Kevlar); and b) Poly styrene(PS).

**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 poly lactic acid.

## **UNIT-IV-CHEMICAL FUELS (10)**

**Fuels:** Introduction, classification, requisites of a good fuel. Calorific value (CV)-HCV and LCV. Calculation of CV using Dulong's formula, numericals. Chemistry of combustion - numericals on weight- volume and weight-weight methods.

**Solid Fuels:** Coal: Proximate analysis of coal and its significance.

**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. Catalytic converters and their role in reducing

the toxicity of automobile exhaust emissions. Composition and CV of diesel oil, cetane number.

**Bio-diesel:** Source, chemistry of transesterification and advantages of bio diesel.

### **UNIT-V: WATER TECHNOLOGY (9)**

Hardness of water – types. Calculation of degree of hardness of water-numericals. Determination of hardness of water by EDTA method numericals. Boiler troubles – scales and sludges formation and prevention – Calgon conditioning. Desalination of water by Reverse Osmosis and electro dialysis. Specifications of potable water. Water treatment for drinking purpose sterilization by chlorination – concept of Break Point Chlorination.

#### **Text Books:**

1. P. C. Jain, M Jain Engineering Chemistry, Dhanapathi Rai and sons (16<sup>th</sup> edition), New Delhi.
2. Sashi Chawla, Text book of Engineering Chemistry, Dhanapathi Rai & sons, New Delhi.
3. O. G. PALANNA, Engineering Chemistry, TMH Edition.
4. Wiley Engineering chemistry, Wiley India Pvt. Ltd., II edition.
5. Chemistry in engineering and technology by J. C. Kuriacose and Rajaram.

#### **Learning Resources:**

1. University chemistry, by B. H. Mahan
2. Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan
3. Physical Chemistry, by P. W. Atkins
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. NPTEL Polymer Chemistry Course, D. Dhara, IIT Kharagpur.
7. Polymer chemistry by Gowariker.

#### **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: <b>90 Minutes</b>				

**VASAVI COLLEGE OF ENGINEERING (Autonomous)**

IBRAHIMBAGH, HYDERABAD – 500 031

**DEPARTMENT OF CIVIL ENGINEERING****BASIC ENGINEERING MECHANICS**

SYLLABUS FOR B.E. I SEMESTER

L : T : P(Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U23ES110CE
Credits: 3	CIE Marks:40	Duration of SEE: 3 Hrs

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
Objectives of this course are to:	At the end of the course, students will be able to:
<ol style="list-style-type: none"> <li>1. Explain the resolution of a system of forces (coplanar, spatial, concurrent, non-concurrent) and compute their resultant.</li> <li>2. Solve particle equilibrium problem using equation of equilibrium</li> <li>3. Determine forces in the members of a truss</li> <li>4. Perform analysis of bodies lying on rough surfaces.</li> <li>5. Locate the centroid of a body and also compute the area moment of inertia of standard and composite sections.</li> </ol>	<ol style="list-style-type: none"> <li>1. Determine resultant of forces acting on a body.</li> <li>2. Analyse equilibrium of a body subjected to a system of forces.</li> <li>3. Perform analysis of trusses using method of joints and method of sections.</li> <li>4. Solve problem of bodies subjected to friction.</li> <li>5. Find the location of centroid and calculate moment of inertia and polar moment of inertia of a given section.</li> </ol>

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

**UNIT-II: Equilibrium of Force Systems:** Free body diagram, Equations of equilibrium, Equilibrium of planar and spatial system.

**UNIT-III: Determinate Trusses:** Analysis of plane trusses like Warren girder, 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 and belt friction, 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.

**Learning Resources:**

1. Singer F.L. "Engineering Mechanics", Harper & Collins, Singapore, 3<sup>rd</sup> Edition 2011.
2. Timoshenko S.P and Young D.H "Engineering Mechanics", McGraw Hill International Edition, 2017
3. Andrew Pytel., JaanKiusalaas., "Engineering Mechanics", 4<sup>th</sup> edition, Cengage Learning, 2015.
4. Beer F.P & Johnston E.R Jr. "Vector Mechanics for Engineers", TMH, 2019.
5. Hibbeler R.C, "Engineering Mechanics", 4<sup>th</sup> edition, Pearson Education, 2017.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", 4<sup>th</sup> edition, Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2014, 2<sup>nd</sup> 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](http://www.nptel.ac.in))
10. Virtual labs ([www.vlab.co.in](http://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):3:0:0	SEE Marks:60	Course Code: U23ES110EE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	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.	<ol style="list-style-type: none"> <li>1. Apply the fundamental concepts to solve the problems in single phase and 3 phase AC circuits.</li> <li>2. Analyze the behaviour of transformer and demonstrate the principle of operation and performance characteristics of DC Machines.</li> <li>3. Select suitable three phase induction motor and also interpret speed control method for different applications.</li> <li>4. To understand the Electronic devices, Operational Amplifier Fundamentals &amp; OP-AMP Linear Applications.</li> <li>5. Understand the number system, different codes, and code conversion and Design different combinational circuits.</li> </ol>

**Unit-I****Electrical Circuits:**

Ohm's law, KCL, KVL, single phase AC circuit fundamentals, power, power factor, 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, losses and efficiency, speed control of DC motor, applications.

**AC Machines:**

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

3 -  $\phi$  Induction Motor: construction, principle of operation, torque equation, 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

**Linear Integrated Circuits:** Operational amplifiers, ideal op – amp characteristics, inverting and noninverting amplifier. Op – amp applications: adder, subtractor, integrator, differentiator, comparator, zero crossing detector.

### Unit – V

**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.S and Muraleedharan. K.A, "BasicElectrical, Electronics and Computer Engineering", Tata McGraw-Hill Publishers, 2006.
3. MurugeshKumar. 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 Goutam Saha, "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: U23ES120CE
Credits: 2	CIE Marks:40	Duration of SEE: 3 Hrs

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
Objectives of this course are to:	At the end of the course, students will be able to:
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 uses, 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 Involute.

**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, 54<sup>th</sup> 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., 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 Hills, 2012.
7. BVR Gupta, M. Raja Roy, "Engineering Drawing with Autocad", IK Int Pvt. Ltd, 2009.
8. NPTEL Course ([www.nptel.ac.in](http://www.nptel.ac.in))
9. Virtual labs ([www.vlab.co.in](http://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 HUMANITIES & SOCIAL SCIENCES****HUMAN VALUES AND PROFESSIONAL ETHICS-1**

SYLLABUS FOR B.E. I-SEMESTER

L : T : P (Hrs./week):1:0 :0	SEE Marks:40	Course Code: U23HS020EH
Credits: 1	CIE Marks:30	Duration of SEE: 3 Hrs

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
Objectives of this course are to:	At the end of the course, students will be able to:
<ol style="list-style-type: none"> <li>1. Get a holistic perspective of value- based education.</li> <li>2. Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations</li> <li>3. Understand professionalism in harmony with self and society.</li> <li>4. Develop ethical human conduct and professional competence.</li> <li>5. Enrich their interactions with the world around, both professional and personal.</li> </ol>	<ol style="list-style-type: none"> <li>1. Understand the significance of value inputs in a classroom and start applying them in their life and profession</li> <li>2. Distinguish between Personal and Professional life goals—constantly evolving into better human beings and professionals.</li> <li>3. Work out the strategy to actualize a harmonious environment wherever they work.</li> <li>4. Distinguish between ethical and unethical practices, and start implementing ethical practices</li> <li>5. Apply ethics and values in their personal and professional interactions.</li> </ol>

**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 Flipped class room

## **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 Ethics – Team

2.3 Flipped class room

## **UNIT-3 SOCIAL VALUES**

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

3.1. Social Values

3.2 Importance of relationship

3.3 Flipped class room

## **UNIT -4 SPIRITUAL VALUES**

Developing individual practice and 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 Spiritual Values

4.2 Mindful Vs Mindfull

4.3 Flipped class room

## **MODE of DELIVERY**

<ul style="list-style-type: none"><li>• Questionnaires</li><li>• Quizzes</li><li>• Case-studies</li><li>• Observations and practice</li><li>• Home and classroom assignments</li></ul>	<ul style="list-style-type: none"><li>• Discussions</li><li>• Skits</li><li>• Short Movies/documentaries</li><li>• Team tasks and individual tasks</li><li>• Research based tasks</li><li>• Viva</li></ul>
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## **Relevant Websites, CD's and Documentaries**

- <https://plato.stanford.edu/>

## **Learning Resources:**

[learn.talentsprint.com](https://learn.talentsprint.com)

## **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):2:0:0	SEE Marks:60	Course Code:U23MC010CE
Credits : - - -	CIE Marks:40	Duration of SEE: 3 Hrs

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
<ol style="list-style-type: none"> <li>1. Describe various types of natural resources available on the earth surface.</li> <li>2. Explain the concepts of an ecosystem and the biotic and abiotic components of various aquatic ecosystems.</li> <li>3. Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity.</li> <li>4. Explain the causes, effects and control measures of various types of environmental pollutions.</li> <li>5. Describe the methods for water conservation, the causes, effects of global warming, climate change, acid rain, ozone layer depletion, population explosion.</li> </ol>	<ol style="list-style-type: none"> <li>1. Describe the various types of natural resources.</li> <li>2. Differentiate between various biotic and abiotic components of ecosystem.</li> <li>3. Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India.</li> <li>4. Illustrate causes, effects, control measures of various types of environmental pollutions.</li> <li>5. Explain the methods of water conservation, causes, effects of climate change, global warming, acid rain and ozone layer depletion, population explosion.</li> </ol>

**UNIT-I: Environmental Studies:** Definition, importance of environmental studies. Natural resources: Water resources; floods, drought, conflicts over water, dams-benefits and problems. Food resources; Effects of modern agriculture, fertilizer-pesticide problems, Eutrophication, Biomagnification, water logging, salinity. Energy resources: Renewable and non-renewable energy resources. Land Resources, soil erosion and desertification.

**UNIT-II: Ecosystems:** Definition of ecosystem, classification of ecosystem, Structure and function of an ecosystem, producers, consumers and decomposers, food chains, food webs, ecological pyramids, aquatic ecosystem (ponds) ,Terrestrial ecosystem (Forest)

**UNIT-III: Biodiversity:** Definition, Genetic, species and ecosystem level diversity. Values of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity. Biological diversity Act 2002.

**UNIT-IV: Environmental Pollution:** Causes, effects and control measures of air pollution, air pollution control devices (catalytic convertor) water pollution, water pollution monitoring devices, soil pollution, noise pollution, solid waste types, Municipal solid waste & e-waste management.

**UNIT-V: Social Aspects and the Environment:** Water conservation, Climate change, global warming, case study related to self cooling technologies, acid rain, ozone layer depletion, Kyoto protocol. Environmental Impact Assessment, population explosion. Consumerism, Sustainable development goals (SDG-17), Environmental protection act 1986.

### **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. Saunders 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	: 2	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:U23BS011CH
Credits : 1	CIE Marks:30	Duration of SEE: 3 Hrs

<b>COURSE OBJECTIVES:</b>	<b>COURSE OUTCOMES:</b>
The course will enable the students to:	At the end of the course, students should be able to:
1. Describe the quantitative analytical techniques 2. Learn the skills to handle the instruments 3. Apply the theoretical principles in experiments 4. Examine the accuracy	1. Estimate the amount of metals in the given solutions. 2. Analyze the hardness, alkalinity and chloride content of a given water sample. 3. Determine the amount of a substance in 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.

<b>CO-PO MAPPING FOR CHEMISTRY LAB</b>												
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  $\text{KMnO}_4$  or  $\text{NaOH}$  solution.
2. Estimation of ferrous iron 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 hypo.
5. Estimation of available chlorine in bleaching powder.
6. Estimation of total hardness of given water sample.
7. Estimation of alkalinity of a given sample.

8. Conductometric acid-base titrations -Determination of strength of given acids (HCl Vs NaOH and  $\text{CH}_3\text{COOH}$  Vs NaOH).
9. Conductometric acid-base titrations- Determination of strength of acids in a given mixture of acids (HCl and  $\text{CH}_3\text{COOH}$  Vs NaOH)
10. Determination of strength of a given acid by Potentiometry.
11. Determination of concentration of a given  $\text{FeSO}_4$  using redox titration by Potentiometry.
12. Determination of strength of a given acid by pH metry.
13. Determination of strength of permanganate or copper in brass solution by Colorimetry.
14. Synthesis of Phenol formaldehyde resin / PANI.
15. Chemistry of blue printing.

#### 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 Mechanical Engineering****ENGINEERING WORKSHOP-I**

SYLLABUS FOR B.E. I-SEMESTER

(Common to Mechanical, Civil &amp; EEE branches)

L:T:P(Hrs/week):0:0:2	SEE Marks:50	Course Code:U23ES111ME
Credits :01	CIE Marks:30	Duration of SEE:03Hours

<b>COURSE OBJECTIVES</b> <i>The objective of the course is to</i>	<b>COURSE OUTCOMES</b> <i>On completion of the course, students will be able to</i>
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, Electrical & Electronics and Sheet metal trades by using the relevant tools. measure and inspect the finished 2 components using suitable measuring instruments. apply basic electrical and electronics 3 engineering knowledge to make simple electrical circuits and check their functionality along with practice in soldering of electronic components.

**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. Plastic Moulding: Injection moulding of plastic spoon (demo)
2. Plumbing: Geyser connection (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. "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" 4<sup>th</sup> 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" 2<sup>nd</sup> Ed., Scitech publications (I) Pvt. Ltd., Hyderabad.
5. B.L. Juneja, "Workshop Practice", Cengage Learning India Pvt. Limited, 2014.
6. [www.technologystudent.com](http://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)**  
**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: U23ES111EE
Credits :01	CIE Marks:30	Duration of SEE: 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b> On completion of the course, students will be able to
To introduce to students the basics of Electrical and Electronic circuits, electrical machines.	<ol style="list-style-type: none"> <li>1. To familiarize with the basic experiments on electrical and electronic fundamentals and machines.</li> <li>2. Design the circuits related to opamps and digital IC's.</li> <li>3. Able to apply the concepts of electrical and electronics circuits to engineering applications.</li> </ol>

**List of Experiments:**

1. Verification of Ohm's law and Kirchoff's laws.
2. Measurement of power and power factor in single phase R – L – C series circuit.
3. Mechanical characteristics of DC shunt and compound motor
4. Load test on 3 – phase induction motor.
5. Speed control of DC shunt motor.
6. Load test on single phase transformer.
7. V – I characteristics of BJT and MOSFET.
8. Study of half wave and full wave rectifiers with and without filters.
9. Applications of operational amplifier: Adder, subtractor, integrator and differentiator.
10. Study of logic gates
11. Implementation of binary half adder and full adder/subtractor.

## 12. Generation of triangular, sine and square wave using IC's

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)** **SCHEME OF INSTRUCTION AND EXAMINATION (R-23)**

### **B.E. – MECH : SECOND SEMESTER (2023-2024)**

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								
U23BS210MA	Differential Equations & Vector Calculus	3	-	-	3	60	40	3
U23BS230PH	Engineering Physics	3	-	-	3	60	40	3
U23ES210CE	Engineering Mechanics	3		-	3	60	40	3
U23ES220CE	Engineering Drawing-II	1	-	2	3	60	40	2
U23PC210ME	Thermodynamics	3	-	-	3	60	40	3
U23HS010EH	English Language and Communication	2	-	-	3	60	40	2
U23MC010ME	Introduction to Entrepreneurship	1	-	-	2	40	30	0
PRACTICALS								
U23HS011EH	English language and Communication Skills Lab	-	-	2	3	50	30	1
U23BS221PH	Applied Physics Lab	-	-	2	3	50	30	1
U23ES211ME	Engineering Workshop –II	-	-	2	3	50	30	1
TOTAL		16	-	8	-	550	360	19
GRAND TOTAL		24				910		19
1) Student should complete one NPTEL certification course equivalent to 2 credits (8 weeks) by the end of VI 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**  
**DIFFERENTIAL EQUATIONS & VECTOR CALCULUS**  
**(Common to Civil, EEE, ECE, Mech)**  
 SYLLABUS FOR B.E II – SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks: 60	Course Code: U23BS210MA
Credits :03	CIE Marks:40	Duration of SEE:03Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to :	At the end of the course students should be able to:
1. Study the concepts of vector differentiation. 2. Learn how to evaluate double and triple integrals and Study the concepts of vector integration. 3. Learn to Solve the first order differential equations and its applications. 4. Learn to Solve the various higher order homogeneous and non-homogeneous linear differential equations with constant coefficients and its applications. 5. Understand the concepts of Beta, Gamma functions and Error function	1. Find the gradient of a scalar point function, divergence and curl of vector field and its applications. 2. Apply the concepts of multiple integrals to evaluate area, volume and vector integral theorems 3. Solve the first order differential equations, model the real time engineering problems viz., RC & LR Circuits into differential equations. 4. Solve the higher order Linear Differential equations; model the real time engineering problems. 5. Evaluate Improper integrals using Beta, Gamma functions

### **UNIT – I (10 classes)**

#### **ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER**

Exact first order differential equations - Integrating factors - Clairaut's equation -Applications: Orthogonal trajectories (Cartesian families), LR and RC Circuits.

### **UNIT – II (12 classes)**

#### **HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS**

Solutions of Homogeneous and Non-Homogeneous linear equations with constant coefficients: Complimentary function & Particular Integral-Method of Variation of Parameters. LCR circuits

### **UNIT – III (10 classes)**

#### **SPECIAL FUNCTIONS**

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

### **UNIT – IV (10 classes)**

#### **MULTIPLE INTEGRALS**

Double and Triple integrals (Cartesian) - Change of order of integration (Cartesian Coordinates)- Jacobian for two variables - Change of the Variables (Cartesian to polar Coordinates).

### **UNIT – V (12 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- Line integral - Green's Theorem (Without proof) - Conservative vector field.

#### **Learning Resources:**

1. Advanced Engineering Mathematics 3<sup>rd</sup> Edition, R.K.Jain&S.R.K.Iyengar, Narosa Publishing House.
2. Higher Engineering Mathematics 40<sup>th</sup> Edition 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, 8<sup>th</sup> Edition by Erwin Kreyszig , John Wiley & Sons, Inc.
- 3 Complex Variables and applications, J.W.Brown and R.V.Churchill, 7<sup>th</sup> Edition, Tata Mc Graw Hill, 2004.

#### **Online Resources :**

- 1 <http://mathworld.wolfram.com/topics>
- 2 <http://www.nptel.ac.in/course.php>
- 3 <https://www.coursera.org/in>
- 4 <http://davidbau.com>

#### **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): 3:0:0	SEE Marks:60	Course Code: U23BS230PH
Credits :03	CIE Marks:40	Duration of SEE:03Hours

CO code	Course Objectives	Course Outcomes	Highest BTL
BS230PH.1	State principles of interference, diffraction and polarization of light	Outline the principles of wave optics and their applications	3
BS230PH.2	Comprehend lasing action and state various applications of lasers	Compare different types of lasers. Summarize merits and demerits of optical fibers.	2
BS230PH.3	Describe characteristics of acoustic quieting effects required for a hall	Explain production of ultrasonics and summarize good building acoustics	3
BS230PH.4	List of various properties of magnetic materials	Select various magnetic and for specific applications in mechanical engineering.	2
BS230PH.5	Summarize the principles of liquefaction of gasses	Describe liquefaction of gases and their significant 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	2	2	-	-	-	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	-	1
CO5	2	2	-	-	-	-	-	-	-	-	-	-	2

**UNIT-I: WAVE OPTICS (12 hours)**

**Interference:** conditions for sustained interference, interference due to thin parallel film, Newton's rings, applications of interference.

**Diffraction:** Phenomenon of diffraction of light, classes of diffractions, Fraunhofer diffraction due to a single slit, diffraction due to N- slits (plane transmission grating).

**Polarization:** Polarization of light, types of polarized light, double refraction, construction and working of Nicol's Prism, Polarizer and analyzer, Quarter wave and Half wave plates. Relevant applications of wave optics in the field of mechanical engineering.

## **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 CO<sub>2</sub> laser, advantages and applications of lasers in mechanical engineering.

**Optical Fibers:** introduction to optical fibers, propagation of light in an optical fiber, 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, advantages and application of optical fibers. Applications of optical fiber sensors in mechanical engineering.

## **UNIT-III: ACOUSTICS (10 hours)**

**Architectural Acoustics:** classification of sound: musical sound and noise, Characteristics of musical sound-pitch, loudness, timbre, sound intensity, sound pressure levels, reverberation time, absorption coefficient, Sabine's formula, sound absorbent materials, Building acoustic requirements, 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, cavitation. Ultrasonic non-destructive testing applications in mechanical engineering.

## **UNIT-III: MAGNETIC MATERIALS (10hours)**

Origin of magnetism, Ferromagnetic materials, anti-ferromagnetic materials and ferri-magnetic (ferrites) materials, Weiss molecular field theory of ferromagnetism, magnetic domains, hysteresis curve, soft and hard magnetic materials and their applications.



Introduction to superconductivity, General properties of superconductors, Messiner effect, Type I and Type II superconductors-Josephson's Junctions-SQUIDS-Applications of superconductors

### **UNIT-V: 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, Applications of cryogenic liquids including cryogenic treatment of mechanical machine tools.

#### **Learning Resources:**

1. J Walker, D., Halliday and R Resnick, Principles of Physics, 10<sup>th</sup> edition, Wiley, 2016,
2. M.N. Avadhanulu and P.G. Kshirsagar and TVS Arun Murthy, A Textbook Engineering Physics, 11<sup>th</sup> edition, S. Chand, 2019.
3. Mamata Mukhopadhyay, Fundamentals of Cryogenics Engineering, 3<sup>rd</sup> ed PHI, 2016
4. S O Pillai, Solid State Physics, 8<sup>th</sup> edition, New Age International Publishers, 2018

#### **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: <b>90 Minutes</b>				

**VASAVI COLLEGE OF ENGINEERING (Autonomous)**

IBRAHIMBAGH, HYDERABAD – 500 031

**DEPARTMENT OF CIVIL ENGINEERING****ENGINEERING MECHANICS**

SYLLABUS FOR B.E. II-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks: 60	Course Code: U23ES210CE
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:
<ol style="list-style-type: none"> <li>1. Determine the mass moment of inertia and product of inertia of standard and composite sections.</li> <li>2. Understand the concepts of dynamics and its principles.</li> <li>3. Explain kinetics and kinematics of particles, projectiles, curvilinear motion, centroidal motion and plane motion of rigid bodies.</li> <li>4. Impart the concepts of work-energy method and its applications to translation, rotation and plane motion.</li> <li>5. Impart the concept of impulse momentum relation</li> </ol>	<ol style="list-style-type: none"> <li>1. Compute mass moment of inertia and product of inertia of standard and composite section.</li> <li>2. Distinguish between statics and dynamics and differentiate between kinematics and kinetics.</li> <li>3. Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.</li> <li>4. Solve problems using work energy equations for translation, fixed axis rotation and plane motion.</li> <li>5. Solve problems using impulse momentum equation</li> </ol>

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

**UNIT-II: Kinematics:** Rectilinear motion, Curvilinear motion, Projectile motion, Velocity and acceleration, Types of rigid body motion, and its analysis in a plane.

**UNIT-III: Kinetics:** Analysis as a particle, Analysis as a rigid body in translation, Fixed axis rotation. Rolling bodies, Plane motion.

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

**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, 3<sup>rd</sup> Edition 2011.
2. Timoshenko S.P and Young D.H., J V Rao, Sukumar Patil, "Engineering Mechanics (SI Units)", McGraw Hill, 5<sup>th</sup> edition.2013.
3. Andrew Pytel, JaanKiusalaas, "Engineering Mechanics", Cengage Learning, 4<sup>th</sup> edition, 2016.
4. Beer F.P & Johnston E.R Jr. "Vector Mechanics for Engineers", TMH, 12<sup>th</sup> 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, 2<sup>nd</sup> edition, 2014.
8. Meriam. J. L., "Engineering Mechanics", Volume-II Dynamics, John Wiley & Sons, 4<sup>th</sup> edition, 2008.
9. NPTEL Course ([www.nptel.ac.in](http://www.nptel.ac.in))
10. Virtual labs ([www.vlab.co.in](http://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: U23ES220CE
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:
<ol style="list-style-type: none"> <li>1. Explain the principles involved in Section of simple solids</li> <li>2. Develop surfaces of simple solids</li> <li>3. Explain intersection of cylinder with cylinder and cylinder with cone</li> <li>4. Differentiate between isometric view and isometric projection</li> <li>5. Draw orthographic views from pictorial views</li> </ol>	<ol style="list-style-type: none"> <li>1. Draw sectional views of simple solids</li> <li>2. Develop the lateral surfaces of simple solids</li> <li>3. Prepare orthographic views of intersection of solids.</li> <li>4. Visualize isometric view of simple planes, solids and combined solids</li> <li>5. Construct orthographic views of simple objects from their pictorial views</li> </ol>

**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, 54<sup>th</sup> 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](http://www.nptel.ac.in))
9. Virtual labs ([www.vlab.co.in](http://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: U23PC210ME
Credits :03	CIE Marks:40	Duration of SEE:03Hours

<b>Course Objectives</b>	<b>Course Outcomes</b>
The prime objective of the course is to dwell into transition of heat and work across Thermodynamic system and the basic governing laws of thermodynamics.	<p>On completion of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Apply the basic knowledge of thermodynamics to determine the state properties.</li> <li>2. Estimate the energy transfers by applying the first-law of thermodynamics to closed system (control mass) and open system (control volume).</li> <li>3. Analyze the problems on heat engines, refrigerators and entropy by applying the second-law of thermodynamics to various systems and processes.</li> <li>4. Estimate the thermodynamic properties of pure substances by using property tables and Mollier Diagram</li> <li>5. Evaluate the performance of air standard cycles and Rankine vapour power cycle that form the basis for various thermal prime movers.</li> </ol>

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; concept of Continuum; thermodynamic properties, thermodynamic state, process and cycle, quasi-static process, thermodynamic equilibrium; definition of energy, pressure and temperature; ideal gas; the Zeroth law of thermodynamics; temperature scales.

## **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-state process, 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[Concepts with P-v and T-s diagram].

### **Learning Resources:**

1. R.E. Sonntag, C. Borgnakke & G.J. Van Wylen, "Fundamentals of Thermodynamics", 6<sup>th</sup> edition, John Wiley Publications, 2015
2. P.K. Nag, "Engineering Thermodynamics", 5<sup>th</sup> edition, McGraw Hill Education, 2014.
3. Y. Cengel & M. Boles, "Thermodynamics an Engineering approach", 7<sup>th</sup> Edition, McGraw Hill, 2011.
4. P.L. Ballaney, "Thermal Engineering", 25<sup>th</sup> edition, 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: <b>90 Minutes</b>				

**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: U23HS010EH
Credits :02	CIE Marks:40	Duration of SEE:03Hours

<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The course will enable the learners to:</p> <ol style="list-style-type: none"> <li>1. Build greater confidence and proficiency in oral and written communication.</li> <li>2. Equip themselves with essential language skills to analyze and articulate their point of views.</li> <li>3. Develop the ability to engage in reading for reflection and enquiry.</li> <li>4. Construct grammatically correct and contextually appropriate correct sentences.</li> <li>5. Learn how project reports are written in their related field of study.</li> </ol>	<p>At the end of the course the learners will be able to:</p> <ol style="list-style-type: none"> <li>1. Communicate effectively and appropriately in both professional &amp; personal spheres.</li> <li>2. Listen to different types of spoken discourses and use them in relevant contexts.</li> <li>3. Construct grammatically correct sentences using adequate vocabulary to compose written and spoken discourses.</li> <li>4. Read, evaluate and appreciate various text types.</li> <li>5. Research, collect data and write branch - specific structured project reports in English</li> </ol>

**UNIT-1**

**1.0 Effective communication and Interpersonal skills**

- 1.1 Role and Importance of Communication – styles, channels and barriers of communication.
- 1.2 Politeness theory – Brown & Levinson.
- 1.3 Johari Window
- 1.4 Persuasion techniques.
- 1.5 Stages of Team Building by Bruce Tuckman

**UNIT-2                      2.0 Listening and Speaking skills**

- 2.1 Importance of listening--Types of listening
- 2.2 Speaking skills: Grice's – conversational Principles



### **UNIT-3            3.0 Reading and Writing skills**

- 3.1 Reading strategies- SQ3R – Survey, Question, Read, Recite, Review.
- 3.2 Features of Writing---Principles of writing paragraphs-Coherence, Cohesion & Unity; Use of appropriate linkers/connectives.
- 3.3 Request letters
- 3.4 Writing structured project reports.

### **UNIT-4            4.0 Vocabulary Building and Grammar**

- 4.1 **Vocabulary Building:** Synonyms, Antonyms, One-word substitutes; Collocations; Idioms.
- 4.2 **Functional Grammar:** Articles, Prepositions; Tense and Aspect; Subject-Verb agreement; Direct and Indirect Speech.

### **UNIT-5            5.0 Reading for appreciation of literary texts**

- 5.1 **Prose text** - Our Own Civilization — CEM Joad.
- 5.2 **Poem** - What Life should be-Patricia A Fleming.

#### **Prescribed textbook for theory:**

Technical communication - Principles and Practice (Latest Edition ) -  
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. Sunitha Mishra,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: politeness 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 Mechanical Engineering****INTRODUCTION TO ENTREPRENEURSHIP**

SYLLABUS FOR B.E.II-SEMESTER

L:T:P(Hrs/week):1:0:0	SEE Marks:40	Course Code: U23MC010ME
Credits : --	CIE Marks:30	Duration of SEE: 02Hours

<b>COURSE OBJECTIVE</b> <i>The objective of the course is to</i>	<b>COURSE OUTCOMES</b> <i>On completion of the course, students will be able to</i>
inspire students to develop an entrepreneurial mind-set, educate about the resources and schemes available to start enterprises in India.	<ol style="list-style-type: none"> <li>1 get awareness about entrepreneurship and potentially become an entrepreneur.</li> <li>2 discern the characteristics required to be a successful entrepreneur</li> <li>3 know the importance of effective communication.</li> <li>4 demonstrate effective sales skills</li> </ol>

**CO-PO Mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1									1		1				1
CO2												1		1	
CO3												1			
CO4							1		1				1		
CO5										1	1				

**Unit-I:** Sources of new ideas, techniques for generating ideas.

Team formation, how entrepreneurship has changed the country and world, entrepreneurial myths, E-cells and their significance, success story of entrepreneurs, eg: Practo, global entrepreneurs, entrepreneurial journeys, challenges, and successes, characteristics of a successful entrepreneur, entrepreneurial styles, introduction to business model.

**Unit-II:** Importance of effective communication for entrepreneurs, communication barriers, miscommunication, incorrect assumptions about people, importance of listening, design thinking, sales skills, understanding the customer-centric approach, personal selling techniques, show and tell, elevator pitch, managing risks and learning from failures, women entrepreneurs.

### **Learning Resources:**

1. Bruce R. Barringer and R. Duane Ireland, "Entrepreneurship: successfully launching new ventures", 3<sup>rd</sup> edition, Pearson Prentice Hall, 2009.
2. P. Denning and R. Dunham, "The Innovator's Way", MIT Press: Cambridge, Massachusetts, 2010.
3. Arya Kumar, "Entrepreneurship", Pearson Education, Delhi, 2012.
4. Michael H. Morris, D.F.Kuratko, J G Covin, "Corporate Entrepreneurship and Innovation", Cengage learning, New Delhi, 2010
5. Peter F. Drucker, "Innovation and Entrepreneurship", Routledge Classics, 2015.
6. Eric Ries, "The Lean Start-up", Currency, 1st edition, 2011.

### **Web Resources:**

7. <http://www.learnwise.org>

### **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: U23HS011EH
Credits :01	CIE Marks:30	Duration of SEE:03Hours

<b>Course Objective</b> <i>The objective of the course is to</i>	<b>Course Outcomes</b> <i>On completion of the course, students will be able to</i>
<ol style="list-style-type: none"> <li>1. Learn the speech sounds, parts of speech and distinguish between vowel and consonant sounds in the English language to reduce mother tongue influence when speaking English</li> <li>2. Understand and follow the rules in debates, group discussions, interviews.</li> <li>3. Develop reading skills and analyse various text types.</li> </ol>	<ol style="list-style-type: none"> <li>1. Speak well using generally acceptable English' in terms of pronunciation and use of diction.</li> <li>2. Participate effectively in group discussions, public speaking, debates (formal and informal).</li> <li>3. Analyse, evaluate and infer meaning from different types of texts.</li> </ol>

**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.

**1.2 Aspects of language learning and ear training activities-**

Word stress and intonation, Pronunciation of silent letters, mispronounced words, and Foreign words used in English

**2.0 INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS**

**2.1 Formal and informal conversations**—From initiating to terminating stage.

**2.2 Group discussion:** Objectives of GD, Types of GDs; Initiating, Sustaining, and concluding a GD—Using discourse markers.

**2.3 Public speaking:**

Dos and don'ts of public speaking. Listening and analysing speeches of great personalities in history, Josh talks, Movies.

## 2.4 **Debate:**

Understanding the difference between a debate and a group discussion, essentials of debates.

### **3.0 READING SKILLS LAB - TOPICS**

3.1 Strategies of reading using SQ3R, applying it to various text types.

3.2 Teaching different types of texts for comprehension—From short stories to technical articles.

Newspaper reading. Summarizing, paraphrasing, and presenting news articles.

### **Prescribed textbook for laboratory:**

1. Speak Well: Jayshree Mohanraj, Kandula Nirupa Rani and Indira Babbellapati - Orient Black Swan
2. Longman Dictionary of Contemporary English—Latest Edition.

### **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****APPLIED 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: U23BS221PH
Credits :01	CIE Marks:30	Duration of SEE:03Hours

Course Objectives	Course Outcomes	BTL
1. to study and discuss the characteristics of a given device	1. 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. Outline the precautions required to be taken for each experiment	1
3. to compare the experimental and theoretical values and draw possible conclusions.	3. Compare the experimental results with standard values and estimate errors	2
4. To interpret the results from the graphs drawn using experimental values.	4. Draw graphs and interpret the results with respect to graphical and theoretical values	2
5. To write the record independently with appropriate results.	5. Write the 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	2	-	-	-	-	-	-	-	2	-	-	-	2
CO2	3	-	-	-	-	-	-	-	-	-	-	-	1
CO3	2	2	-	-	-	-	-	-	-	-	-	-	1
CO4	3	-	-	-	-	-	-	-	-	-	-	-	1
CO5	2	-	-	-	-	-	-	1	-	-	-	-	2

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. Study of I-V characteristics of solar cell and to calculate fill factor and efficiency
12. Gyroscope- study of gyroscopic effects.

\*Each student should perform at least 10 (Ten) 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-II**

SYLLABUS FOR B.E.II-SEMESTER

(Common to Mechanical, Civil & EEE Branches)

L:T:P(Hrs/week):0:0:2	SEE Marks:50	Course Code: U23ES211ME
Credits :01	CIE Marks:30	Duration of SEE:03Hours

<b>COURSE OBJECTIVES</b> <i>The course will enable the students to</i>	<b>COURSE OUTCOMES</b> <i>On completion of the course, students will be able to</i>
<ol style="list-style-type: none"> <li>1 know basic workshop processes, adopt safety practices while working with various tools</li> <li>2 identify, select and use various marking, measuring, holding, striking and cutting tools &amp; equipments.</li> </ol>	<ol style="list-style-type: none"> <li>1 create models in Smithy, Welding, fitting and Machining trades by using the relevant tools.</li> <li>2 measure and inspect the finished components using suitable measuring instruments.</li> <li>3 document the observations and procedure in the record.</li> </ol>

### **List of the Experiments:**

#### **BLACK SMITHY**

1. Flattening (round to square cross section)
2. Bending operation (U-shape)
3. S-shape hook

#### **WELDING**

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

#### **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. Black Smithy: Fullering operation (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" 4<sup>th</sup> 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" 2<sup>nd</sup> Ed., Scitech publications (I) Pvt. Ltd., Hyderabad.
5. B.L. Juneja, "Workshop Practice", Cengage Learning India Pvt. Limited, 2014.
6. [www.technologystudent.com](http://www.technologystudent.com)
7. [www.mewelding.com](http://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			