

**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**



**SYLLABUS BOOK FOR  
B.E (CIVIL) I and II SEMESTER  
UNDER CBCS WITH EFFECT FROM 2023–2024  
(For the students admitted in 2023-24)**



**DEPARTMENT OF CIVIL ENGINEERING  
+91-40-23146010, 23146011  
Fax: +91-40-23146090  
Website: [www.vce.ac.in](http://www.vce.ac.in)**

## DEPARTMENT MISSION

*“To strive for excellence in order to make the students better citizens with technical knowledge and social awareness”*

## DEPARTMENT VISION

*“To impart knowledge in the latest technologies to the students of civil engineering to fulfil the growing needs of the society.”*

## **Institution Vision**

"Striving for a symbiosis of technological excellence and human values."

## **Institution Mission**

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

## **Department Vision**

To strive for excellence in order to make the students better citizens with technical knowledge and social awareness

## **Department Mission**

To impart knowledge in the latest technologies to the students of civil engineering to fulfil the growing needs of the society.

## **Program Educational Objectives (PEOs):**

1. To provide a better understanding of basic sciences and fundamentals of civil engineering.
2. To develop competence in latest technologies to serve the industry or pursue higher studies.
3. To inculcate professionalism with effective communication skills and ethical values.

## **Program Outcomes (POs)**

### **Engineering Graduates will be able to:**

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## **Program Specific Outcomes (PSOs)**

1. Understand various concepts of basic engineering sciences and mathematics to learn advanced concepts of Civil Engineering and apply them to practical problems.
2. Apply principles of various specializations of Civil engineering including structural engineering, transportation engineering, environmental engineering, water resources engineering and Geotechnical engineering to tackle engineering problems.
3. Acquire knowledge of ethical practices, communication skills, technical report writing skills and collaborative effort leading to lifelong learning.

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**DEPARTMENT OF CIVIL ENGINEERING**  
**SCHEME OF INSTRUCTION AND EXAMINATION (R-23)**  
**BE (CIVIL ENGINEERING) I-SEMESTER ACADEMIC YEAR 2023 - 2024**  
**(Students Admitted in 2023-24)**

Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			Credits
		Hours per Week			Duration in Hrs	Maximum Marks		
		L	T	P/D		SEE	CIE	
<b>THEORY</b>								
U23HS020EH	Human Values and Professional Ethics-I	1	-	-	2	40	30	1
U23BS110MA	Matrices and Calculus	3	-	-	3	60	40	3
U23BS120CH	Applied Chemistry	3	-	-	3	60	40	3
U23ES110EE	Basic Electrical Engineering for Civil Engineers	2	-	-	3	60	40	2
U23ES110CE	Basic Engineering Mechanics	3	-	-	3	60	40	3
U23ES120CE	Engineering Drawing – I	1	-	2	3	60	40	2
U23MC010CE	Environmental Science	2	-	-	3	60	40	-
<b>PRACTICALS</b>								
U23BS011CH	Chemistry Lab	-	-	2	3	50	30	1
U23ES111ME	Engineering Workshop-I	-	-	2	3	50	30	1
U23ES111EE	Basic Electrical Engineering Lab for Civil Engineers	-	-	2	3	50	30	1
<b>Total</b>		<b>15</b>	<b>-</b>	<b>8</b>		<b>550</b>	<b>360</b>	<b>17</b>
<b>Grand Total</b>		<b>23</b>				<b>910</b>		
Note: The left over hours are to be allotted to Sports / Library / Mentor Interaction/CC/RC/TC/PDC based on the requirement.								

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**(Students Admitted in 2023-24)**

**INTERDISCIPLINARY COURSES OFFERED BY CIVIL ENGINEERING**

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	
<b>Theory (Common to CSE &amp; IT)</b>								
U23ES130CE	Basic Engineering Drawing	1	-	2	3	60	40	2
<b>Theory (Common to Mech. EEE, &amp; ECE)</b>								
U23MC010CE	Environmental Science	2	-	-	3	60	40	-
<b>Theory (Common to CSE, ECE, EEE, &amp; Mech.)</b>								
U23ES110CE	Basic Engineering Mechanics	3	-	-	3	60	40	3
<b>Theory (Mech.)</b>								
U23ES120CE	Engineering Drawing – I	1	-	2	3	60	40	2



VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS),  
IBRAHIMBAGH, HYDERABAD-500031

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES  
**HUMAN VALUES AND PROFESSIONAL ETHICS-I**  
(Common to all branches)

SYLLABUS FOR I- SEMESTERS

L: T: P (Hrs/Week):1:0:0	SEE Marks: 40	Course Code:U23HS020EH
Credits:1	CIE Marks: 30	Duration of SEE: 2 Hours

<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-I: 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, 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-II: 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-III: 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-IV: 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:

- 1. [learn.talentsprint.com](http://learn.talentsprint.com)

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

1	No. of Internal Tests	:	1	Max. Marks for each Internal Test	:	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 : 90 Minutes

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

DEPARTMENT OF MATHEMATICS

**MATRICES AND CALCULUS**

(Common to Civil, EEE, ECE and Mechanical Engineering)

SYLLABUS FOR B.E. I SEMESTER

L : T : P(Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U23BS110MA
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:
<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. 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: MATRICES-I:** Rank of a Matrix- Echelon form - Normal Form - Linearly Dependence and Independence of Vectors– Consistency and Inconsistency of Homogeneous and Non-Homogenous system of linear equations – LU-Decomposition method.

**UNIT–II: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: 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: MULTIVARIABLE CALCULUS:** Limits- Continuity (Concepts) - Partial Derivatives - Higher Order Partial Derivatives - Total Derivatives - 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: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.

### Learning Resources:

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.
3. Advanced Engineering Mathematics 8<sup>th</sup> Edition by Erwin Kreyszig , John Wiley & Sons.
4. Differential Calculus by Shanti Narayan S. Chand & Co
5. Vector Calculus – Schaum's outline series.
6. <http://mathworld.wolfram.com/topics>
7. <http://www.nptel.ac.in/course.php>
8. <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 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		

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DEPARTMENT OF CHEMISTRY  
**APPLIED CHEMISTRY**  
(Common to Civil & Mechanical Engineering)

SYLLABUS FOR B.E. I SEMESTER

L : T : P(Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U23BS120CH
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:
<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>

**UNIT-I: ELECTROCHEMISTRY:** 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:** 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:** 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:** 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:** 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.

**Learning Resources:**

1. P. C. Jain, M Jain Engineering Chemistry, DhanapathiRai and sons (16<sup>th</sup> edition), New Delhi.
2. SashiChawla, Text book of Engineering Chemistry, DhanapathiRai&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.
6. University chemistry, by B. H. Mahan
7. Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan
8. Physical Chemistry, by P. W. Atkins
9. S.S. Dara, S Chand and sons, Engineering Chemistry, New Delhi.
10. Puri, Sharma and Pathania Principles of physical chemistry, Vishal Publishing Co.
11. NPTEL Polymer Chemistry Course, D. Dhara, IIT Kharagpur.
12. Polymer chemistry by Gowariker.

**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

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING  
**BASIC ELECTRICAL ENGINEERING FOR CIVIL ENGINEERS**

SYLLABUS FOR B.E. I SEMESTER

L: T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:U23ES110EE
Credits:2	CIE Marks: 40	Duration of SEE: 3 Hours

<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. To provide an understanding of basics in Electrical circuits</li><li>2. To explain the working principles of Electrical Machines.</li></ol>	<ol style="list-style-type: none"><li>1. Analyze Electrical circuits to compute and measure the parameters of Electrical Energy.</li><li>2. Comprehend the working principles of Electrical DC Machines.</li><li>3. Comprehend the working principle of electrical AC machines.</li></ol>

**UNIT-I:D.C. Circuits :** Electrical circuit elements (R, L and C), independent voltage and current sources, Kirchhoff current and voltage laws, Mesh Analysis, Nodal analysis.

**UNIT II: A.C. Circuits:** Representation of sinusoidal waveform - peak and rms values, form factor, phasor representation, real power, reactive power, apparent power, power factor, Energy, Analysis of single-phase ac series combinations of R-L-C circuits, Three-phase balanced circuits, voltage and current relations in star and delta connections.

**UNIT-III:DC Machines:** Construction, Working principle of DC Generator and DC motor, EMF equation, Types of DC Generators & motors, Torque in a DC motor, Torque – speed characteristic of DC Shunt motor, Speed control of DC shunt motor.



**UNIT IV:AC Machines & Applications:** Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, torque-slip characteristics. Principle And Application of Motors in Lifts, Elevators, Conveyor belts and escalators

### Learning Resources

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
3. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
4. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
5. V.K Mehta, Rohit Mehta, "Principles of Electrical Engineering and Electronics", S Chand & Company Ltd, 2006.
6. J.B. Guptha, A course in electrical installation estimating and costing, reprint 2013, published by S.K. Kataria&Sons.
7. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

### 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			

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING  
**BASIC ENGINEERING MECHANICS**  
(Common to Civil, CSE, ECE, EEE & Mechanical Engineering)

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

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 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. “VectorMechanics 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

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING  
**ENGINEERING DRAWING-I**  
(Common to Civil & Mechanical Engineering)

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

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. Impart skills of drawing instruments and their use to convey exact and complete information of any object.</li><li>2. Explore various scales in Engineering practice</li><li>3. Construct engineering curves.</li><li>4. Prepare orthographic projections of points, lines, planes and solids</li></ol>	<ol style="list-style-type: none"><li>1. Identify the qualities of precision and accuracy.</li><li>2. Convey technical information effectively through sketches / drawings.</li><li>3. Construct engineering curves with different methods.</li><li>4. Develop the conics using different methods, hypocycloidal and involutes.</li><li>5. Draw the orthographic projection of points, lines, planes and solids.</li></ol>

**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 Involutives.

**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", SKKataria & sons, 2012.
4. Venugopal.K "Engineering Drawing and Graphics Plus Autocad" NewAge International (P) Ltd., New Delhi, 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 McGraw 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 CIVIL ENGINEERING  
**ENVIRONMENTAL SCIENCE**  
(Common to Civil, ECE, EEE &Mech.)

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>
Objectives of this course are to:	At the end of the course, students will be able to:
<ol style="list-style-type: none"> <li>Describe various types of natural resources available on the earth surface.</li> <li>Explain the concepts of an ecosystem and the biotic and abiotic components of various aquatic ecosystems.</li> <li>Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity.</li> <li>Explain the causes, effects and control measures of various types of environmental pollutions.</li> <li>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>Describe the various types of natural resources.</li> <li>Differentiate between various biotic and abiotic components of ecosystem.</li> <li>Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India.</li> <li>Illustrate causes, effects, control measures of various types of environmental pollutions.</li> <li>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, DhanpatRai& 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	: 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 CIVIL ENGINEERING  
**BASIC ENGINEERING DRAWING**  
(Common to CSE & IT)

SYLLABUS FOR B.E. I-SEMESTER

L : T : P (Hrs./week):1:0:2	SEE Marks:60	Course Code: U23ES130CE
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 in using drawing instruments to convey exact and complete information of the object. 2. Construct conic sections and regular polygons. 3. Construct the orthographic projections of points, lines, planes and solids. 4. Visualize and construct isometric projections.	1. Understand the fundamentals of drawing. 2. Draw the orthographic projections of points and straight lines. 3. Draw the orthographic projections of planes inclined to both reference planes. 4. Draw the orthographic projections of solids inclined to one reference plane. 5. Draw the isometric projections of lines, planes and solids.

**UNIT-I: Introduction to Engineering Drawing:** Necessity of Engineering Drawing for engineers, Use of Drawing Instruments, Types of Lines, Lettering practice, Dimensioning and its methods, Conic sections by eccentricity method, Regular polygons given the length of side.

**UNIT-II: Orthographic Projections:** Principles of orthographic projections, conventions, projections of points placed in different quadrants. Projections of straight lines inclined to one and two reference planes placed in first quadrant only. Traces (By conventional methods only).

**UNIT-III: Projections of Planes:** Projections of perpendicular planes, oblique planes and their traces.



**UNIT-IV: Projections of Regular Solids:** Projections of prism, cylinder, pyramid and cone in simple positions and axis inclined to one reference plane. Development of lateral surfaces of full solids.

**UNIT-V: Isometric Projections:** Principles of isometric projections – Isometric scale, Isometric axes, Isometric planes, Isometric view. Isometric views of lines, planes, regular solids, and combination of two solids.

**Learning Resource:**

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, 1993.
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, 2011.
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 Drawing" Second Edition, Tata McGraw Hill, 2013
7. BVR Gupta, MRajaRoy, "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 CHEMISTRY  
**CHEMISTRY LAB**

SYLLABUS FOR B.E. I SEMESTER

L : T : P(Hrs./week):0 : 0 : 2	SEE Marks:50	Course Code:U23BS011CH
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. 1.Describe the quantitative analytical techniques 2. 2.Learn the skills to handle the instruments 3. 3.Apply the theoretical principles in experiments	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 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.

**Note: Minimum of Ten experiments of the following.**

- Preparation of standard FAS or oxalic acid solution and standardization of  $\text{KMnO}_4$  or  $\text{NaOH}$  solution.
- Estimation of ferrous iron in the given solution by permanganometry.
- Estimation of chromium (VI) in the given solution by standardized FAS.
- Estimation of copper (II) in given solution by hypo.
- Estimation of available chlorine in bleaching powder.
- Estimation of total hardness of given water sample.
- Estimation of alkalinity of a given sample.
- Conductometric acid-base titrations -Determination of strength of given acids ( $\text{HCl}$  /  $\text{NaOH}$  and  $\text{CH}_3\text{COOH}$  /  $\text{NaOH}$ ).
- Conductometric acid-base titrations- Determination of strength of acids in a given mixture of acids ( $\text{HCl}$  and  $\text{CH}_3\text{COOH}$  /  $\text{NaOH}$ )
- Determination of strength of a given acid by Potentiometry.
- Determination of concentration of a given  $\text{FeSO}_4$  using redox titration by Potentiometry.
- 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:	01	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test:	3 Hours		

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

DEPARTMENT OF MECHANICAL ENGINEERING  
**ENGINEERING WORKSHOP-I**  
(Common to Mechanical, Civil & EEE branches)

SYLLABUS FOR B.E.I-SEMESTER

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. 2 Measure and inspect the finished components using suitable measuring instruments. 3 Apply basic electrical and electronics 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. HajraChoudhury S.K., HajraChoudhury 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)

No. of Internal Tests:	01	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 ENGINEERING FOR CIVIL ENGINEERS 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>
Objectives of this course are to:	Attheendofthecourse,studentswillbeableto:
1. To provide the practical knowledge on operation of DC, AC machines and circuits.	1. Handle the basic electrical equipments. 2. Find the various electrical parameters in DC and Ac circuits. 3. Find the Efficiency of the DC and AC machines.

**List of Experiments:**

- 1 Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Practical resistors, capacitors and inductors
- 2 Verification of mesh and nodal analysis, Sinusoidal steady state response
- 3 of R-L, and R-C circuits – Measurement of phase angle
- 4 Measurement of cumulative three-phase power in balanced three-phase circuits.
- 5 Improvement of power factor in RLC circuits.
- 6 Demonstration of cut-out sections of machines: dc machine (commutator-brush arrangement), induction machine (squirrel cage rotor).
- 7 Torque Speed Characteristic of dc shunt motor
- 8 Speed control of dc shunt motor
- 9 Torque-Slip Characteristic of a three-phase induction motor
- 10 Measurement of electrical energy

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test:	3 Hours		

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**DEPARTMENT OF CIVIL ENGINEERING**  
**SCHEME OF INSTRUCTION AND EXAMINATION (R-23)**  
**BE (CIVIL ENGINEERING) II-SEMESTER ACADEMIC YEAR 2023 - 2024**  
**(Students Admitted in 2023-24)**

Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			Credits
		Hours per Week			Duration in Hrs	Maximum Marks		
		L	T	P/D		SEE	CIE	
<b>THEORY</b>								
U23HS010EH	English Language and Communication	2	-	-	3	60	40	2
U23BS210MA	Differential Equations & Vector Calculus	3	-	-	3	60	40	3
U23BS220PH	Optics, Acoustics and Sensors	3	-	-	3	60	40	3
U23BS210CE	Building Materials and Construction	3	-	-	3	60	40	3
U23ES210CE	Engineering Mechanics	3	-	-	3	60	40	3
U23ES220CE	Engineering Drawing – II	1	-	2	3	60	40	2
U23MC010ME	Introduction to Entrepreneurship	1	-	-	2	40	30	-
<b>PRACTICALS</b>								
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
<i>Student should complete one NPTEL (8 weeks) certificate course equivalent to 2 credits by the end of VI semester</i>								
<b>Total</b>		<b>16</b>	<b>-</b>	<b>8</b>		<b>550</b>	<b>360</b>	<b>19</b>
<b>Grand Total</b>		<b>24</b>				<b>910</b>		
Note: The left over hours are to be allotted to Sports / Library / Mentor Interaction/CC/RC/TC/PCD based on the requirement.								

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**DEPARTMENT OF CIVIL ENGINEERING**  
**SCHEME OF INSTRUCTION AND EXAMINATION (R-23)**  
**BE (CIVIL ENGINEERING) II-SEMESTER ACADEMIC YEAR 2023 - 2024**  
**(Students Admitted in 2023-24)**

**INTERDISCIPLINARY COURSES OFFERED BY CIVIL ENGINEERING**

Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			Credits
		Hours per Week			Duration in Hrs	Maximum Marks		
		L	T	P/D		SEE	CIE	
<b>Theory (Common to EEE &amp; ECE)</b>								
U23ES230CE	Basic Engineering Drawing	1	-	2	3	60	40	3
<b>Theory (Common to CSE &amp; IT)</b>								
U23MC010CE	Environmental Science	2	-	-	3	60	40	-
<b>Theory (Mech.)</b>								
U23ES210CE	Engineering Mechanics	3	-	-	3	60	40	3
U23ES220CE	Engineering Drawing – II	1	-	2	3	60	40	2
<b>Theory (IT)</b>								
U23ES240CE	Basic Engineering Mechanics	3	-	-	3	60	40	3



VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS),  
IBRAHIMBAGH, HYDERABAD-500031

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES  
**ENGLISH LANGUAGE AND COMMUNICATION**

SYLLABUS FOR B.E. II-SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks:60	Course Code: U23HS010EH
Credits :02	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:
1. Build greater confidence and proficiency in oral and written communication.	1. Communicate effectively and appropriately in both professional & personal spheres.
2. Equip themselves with essential language skills to analyze and articulate their point of views.	2. Listen to different types of spoken discourses and use them in relevant contexts.
3. Develop the ability to engage in reading for reflection and enquiry.	3. Construct grammatically correct sentences using adequate vocabulary to compose written and spoken discourses.
4. Construct grammatically correct and contextually appropriate correct sentences.	4. Read, evaluate and appreciate various text types.
5. Learn how project reports are written in their related field of study.	5. Research, collect data and write branch -specific structured project reports in English

**UNIT-I: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-II: 2.0 Listening and Speaking skills**

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

### **UNIT-III: 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-IV: 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-V: 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.

#### **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 MATHEMATICS  
**DIFFERENTIAL EQUATIONS & VECTOR CALCULUS**  
(Common to Civil, ECE, EEE & Mechanical Engineering)

SYLLABUS FOR B.E. II SEMESTER

L : T : P(Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U23ES210MA
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:
<ol style="list-style-type: none"> <li>1. Study the concepts of vector differentiation.</li> <li>2. Learn how to evaluate double and triple integrals and Study the concepts of vector integration.</li> <li>3. Learn to Solve the first order differential equations and its applications.</li> <li>4. Learn to solve the various higher order homogeneous and non-homogeneous linear differential equations with constant coefficients and its applications.</li> <li>5. Understand the concepts of Beta, Gamma functions and Error function</li> </ol>	<ol style="list-style-type: none"> <li>1. Find the gradient of a scalar point function, divergence and curl of vector field and its applications.</li> <li>2. Apply the concepts of multiple integrals to evaluate area, volume and vector integral theorems</li> <li>3. Solve the first order differential equations, model the real time engineering problems viz., RC&amp; LR Circuits into differential equations.</li> <li>4. Solve the higher order Linear Differential equations; model the real time engineering problems.</li> <li>5. Evaluate Improper integrals using Beta, Gamma functions</li> </ol>

**UNIT–I: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: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:SPECIAL FUNCTIONS:** Definition of Improper Integrals. Beta function , Gamma function , Relations between Beta & Gamma function Properties of Beta and Gamma functions.

**UNIT–IV: 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: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, NarosaPublishing 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.
4. Advanced Engineering Mathematics, by Wylie & Barrett, Tata McGraw Hill, New Delhi.
5. Advanced Engineering Mathematics, 8<sup>th</sup> Edition by Erwin Kreyszig , John Wiley & Sons, Inc.
6. Complex Variables and applications, J.W.Brown and R.V.Churchill, 7<sup>th</sup> Edition, Tata McGraw Hill,2004.
7. <http://mathworld.wolfram.com/topics>
8. <http://www.nptel.ac.in/course.php>
9. <https://www.coursera.org/in>
10. <http://davidbau.com>

### 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 PHYSICS  
**OPTICS, ACOUSTICS & SENSORS**

SYLLABUS FOR B.E. II SEMESTER

L : T : P(Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U23BS220PH
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:
<ol style="list-style-type: none"> <li>1. Explain mathematical formulations of waves and oscillations.</li> <li>2. State principles of interference, diffraction and polarization of light.</li> <li>3. Comprehend lasing action and state application of lasers</li> <li>4. Describe characteristics of acoustics quieting effects required for a hall.</li> <li>5. Interpret the advantages of using sensors in civil engineering.</li> </ol>	<ol style="list-style-type: none"> <li>1. Interpret behavior of mechanical oscillators with and without damping effects</li> <li>2. Outline the principles of wave optics and their applications</li> <li>3. Compare different types of lasers. Summarize merits and demerits of optical fibers.</li> <li>4. Explain production of ultrasonics and summarize good building acoustics.</li> <li>5. List various sensors for monitoring health of structures.</li> </ol>

**UNIT-I: OSCILLATIONS:** Definition of SHM, equation of motion and solution to simple harmonic oscillator, energy of simple harmonic oscillator, equation of motion and solution to damped harmonic oscillator, logarithmic decrement, relaxation time, equation of motion and solution to forced harmonic oscillator, Resonance, Q-factor, electromechanical analogy. Real life applications of mass-spring systems.

**UNIT-II: WAVE OPTICS:** 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), application of diffraction.

**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 engineering.

**UNIT-III: LASERS AND OPTICAL FIBRES:** 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 He-Ne laser, advantages and applications of lasers in engineering.

**Optical Fibers:** introduction to optical fibers, propagation of light in optical fiber, numerical aperture, acceptance angle, types of optical fibers, V-Number, signal losses in optical fibers: Attenuation-absorption, Scattering, bending, alignment losses, Signal distortion: intermodal and intra modal losses. Block diagram of optical communication system, advantages and application of optical fibers.

**UNIT-IV: ACOUSTICS:** 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. Sound proofing applications in Civil Engineering.

**Ultrasonics:** properties of ultrasonics, types of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics by piezoelectric, thermal detector, applications of Ultrasonics: SONAR, cavitation. Ultrasonic non-destructive testing applications in civil engineering.

**UNIT-V: SENSORS FOR STRUCTURAL HEALTH MONITORING:** Introduction to Structural Health Monitoring (SHM), Types of Sensors in structural health monitoring: Strain Gauge load cells, Optical Fiber Sensors, Accelerometer, Linear Variable Differential Transformer (LVDT), Tiltmeter, Temperature Sensors: Thermo couple Thermistor..

### Learning Resources:

1. J Walker, D., Halliday and R Resnick, Principles of Physics, 10<sup>th</sup> edition, Wiley, 2016.
2. Jewett and Serway, Physics for Scientists and Engineering, 7<sup>th</sup> edition, 2013.
3. M.N. Avadhanulu and P.G. Kshirsagar and TVS Arun Murthy A Textbook Engineering Physics, 11<sup>th</sup> edition, S. Chand, 2019.
4. John G. Webster and Halit Eren, Measurement, instrumentation, and

Sensors handbook: Spatial, Mechanical, Thermal and Radiation Measurement, CRC press, 2014.

5. Patranabis D, Sensors and Transducers, 2<sup>nd</sup> edition, PHI Learning Pvt Ltd., 2015

**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  
**BUILDING MATERIALS AND CONSTRUCTION**

SYLLABUS FOR B.E. II-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U23BS210CE
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. Expose students to the concepts of building planning and various aspects of green buildings.</li><li>2. Acquire basic knowledge on conventional building materials and emerging building materials</li><li>3. Study construction practices like scaffolding and form work, Stair cases.</li></ol>	<ol style="list-style-type: none"><li>1. Apply the principles of planning and bylaws for planning of building</li><li>2. Explain the characteristics of stones, bricks and timber.</li><li>3. Describe properties of cement aggregate, mortar and illustrate the application of emerging building materials and paints, varnishes and water proofing materials in buildings.</li><li>4. Review construction practices like scaffolding, form work , brick bonds and design of dog legged of stair cases.</li><li>5. Understand sustainability and green building concepts.</li></ol>

**UNIT-I: Building Planning** :Types of buildings, Basic building elements, site selection for buildings, Principles of planning. Relevant Municipal building bylaws National Building Code (NBC) & orientation of buildings.Provision for physically handicapped facilities.

**UNIT-II: Stones:** Uses of stones as building materials, characteristics of good building stones.

**Bricks:** Composition of brick clay, Characteristics of good building bricks, Manufacturing of bricks, classification of bricks.



**Timber:** Timber as a building material and its uses. Various types of timber. Defects in timber, Seasoning and its importance. Preservation of wood. Wood based products used in building construction

**UNIT-III: Cement:** Chemical composition of cement, manufacturing process. Specifications for Ordinary Portland Cement.

**Fine Aggregate:** Characteristics of sand and its classifications, bulking of sand. Quarry sand.

**Coarse Aggregate:** Characteristics of coarse aggregates for preparation of concrete.

**Cement Mortar:** Proportions of Cement Mortar and uses.

**Emerging Building Materials:** Eco friendly and Sustainable building materials- Fly ash, GGBS, Bamboo. Recycled materials- Aggregates, Plastic

**Other Materials:** Paints, Varnishes and Distempers, Damp proofing materials, Light Weight building blocks.

**UNIT-IV: Construction practices:** Scaffolding and Form work, English and Flemish Brick Bonds, – Types and purposes. Plumbing services, Fire protection.

**Stair Cases:** Terminology, Types of stair cases – dog legged, open well, bifurcated and spiral stair case, Design of dog legged stair case.

**Unit – V Introduction to Green Buildings:** Definition of green buildings and sustainable development, typical features of green buildings, benefits of green buildings towards sustainable development. Green building rating systems – GRIHA, IGBC and LEED, overview of the criteria as per these rating systems, concepts of rainwater harvesting.

#### **Learning Resources:**

1. Kumara Swamy N., Kameswara Rao A., Building Planning And Drawing, Charotar, Publications, 2019.
2. Arora S.P. and Bindra S.P., A Text Book of Building Construction, Dhanpat Rai & Sons Publications, 2019.
3. Sushil Kumar, Building Construction, Standard Publishers, 2020.
4. Varghese P.C., Building Materials, PHI Learning Pvt. Ltd., Delhi, 2015.
5. National Building Code of India, 2016.
6. IGBC Green Homes Rating System, Version 3.0., Abridged reference guide, 2019, Indian Green Building Council Publishers.

7. GRIHA version 2019, GRIHA rating system, Green Rating for Integrated Habitat Assessment.
8. Alternative building materials and technologies by K.S. Jagadish, B.V. Venkatarama Reddy and K.S. NanjundaRao; 2017, Newage International Pvt Ltd.

**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 MECHANICS**  
(Common to Civil & Mechanical Engineering)

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, SukumarPatil, “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**  
(Common to Civil & Mechanical Engineering)

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 McGraw Hill, 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 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  
**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>
1. Inspire students develop an entrepreneurial mind-set, educate about the resources and schemes available to start enterprises in India.	1 get awareness about entrepreneurship and potentially become an entrepreneur. 2 discern the characteristics required to be a successful entrepreneur 3 know the importance of effective communication. 4 demonstrate effective sales skills.

**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.
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: 1 Hour



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

DEPARTMENT OF CIVIL ENGINEERING  
**BASIC ENGINEERING DRAWING**  
(Common to ECE & EEE)

SYLLABUS FOR B.E. II-SEMESTER

L:T:P (Hrs./week): 1:0:2	SEE Marks: 60	Course Code: U23ES230CE
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. Impart skills in using drawing instruments to convey exact and complete information of the object.</li><li>2. Construct conic sections and regular polygons.</li><li>3. Construct the orthographic projections of points, lines, planes and solids.</li><li>4. Visualize and construct isometric projections.</li></ol>	<ol style="list-style-type: none"><li>1. Understand the fundamentals of drawing.</li><li>2. Draw the orthographic projections of points and straight lines.</li><li>3. Draw the orthographic projections of planes inclined to both reference planes.</li><li>4. Draw the orthographic projections of solids inclined to one reference plane.</li><li>5. Draw the isometric projections of lines, planes and solids.</li></ol>

**UNIT-I: Introduction to Engineering Drawing:** Necessity of Engineering Drawing for engineers, Use of Drawing Instruments, Types of Lines, Lettering practice, Dimensioning and its methods, Conic sections by eccentricity method, Regular polygons given the length of side.

**UNIT-II: Orthographic Projections:** Principles of orthographic projections, conventions, projections of points placed in different quadrants. Projections of straight lines inclined to one and two reference planes placed in first quadrant only. Traces (By conventional methods only).

**UNIT-III: Projections of Planes:** Projections of perpendicular planes, oblique planes and their traces.

**UNIT-IV: Projections of Regular Solids:** Projections of prism, cylinder, pyramid and cone in simple positions and axis inclined to one reference plane. Development of lateral surfaces of full solids.

**UNIT-V: Isometric Projections:** Principles of isometric projections – Isometric scale, Isometric axes, Isometric planes, Isometric view. Isometric views of lines, planes, regular solids, and combination of two solids.

**Learning Resource:**

1. Bhatt N.D. "Elementary Engineering Drawing", Charotar Publishers, 2014.
2. Thomas E French, Charles J Vierck, Robert J. Foster, "Engineering Drawing and Graphic Technology", McGraw Hill Education, 1993.
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, 2011.
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 Drawing" Second Edition, Tata McGraw Hill, 2013
7. BVR Gupta, MRajaRoy, "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 CIVIL ENGINEERING  
**BASIC ENGINEERING MECHANICS**  
(Syllabus for IT)

SYLLABUS FOR B.E. II SEMESTER

L : T : P(Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U23ES240CE
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:
<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. "VectorMechanics 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
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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  
**ENVIRONMENTAL SCIENCE**  
(Common to CSE & IT)

SYLLABUS FOR B.E. II-SEMESTER

L : T : P (Hrs./week): 2 : 0 : 0	SEE Marks:60	Course Code: U23MC010CE
Credits : - - -	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<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>Describe various types of natural resources available on the earth surface.</li> <li>Explain the concepts of an ecosystem and the biotic and abiotic components of various aquatic ecosystems.</li> <li>Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity.</li> <li>Explain the causes, effects and control measures of various types of environmental pollutions.</li> <li>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>Describe the various types of natural resources.</li> <li>Differentiate between various biotic and abiotic components of ecosystem.</li> <li>Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India.</li> <li>Illustrate causes, effects, control measures of various types of environmental pollutions.</li> <li>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, DhanpatRai& 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, IPE, 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 HUMANITIES & SOCIAL SCIENCES  
**ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB**  
(Common to all branches)

SYLLABUS FOR B.E. II SEMESTER

L : T : P(Hrs./week):0: 0 : 2	SEE Marks:50	Course Code: U23HS011EH
Credits:1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<b>The course will enable the learners to:</b>	<b>On completion of the course, learners will be able to:</b>
<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. Read, analyse, evaluate and infer meaning from different types of texts and Paraphrase them.</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**

- 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.
- 3.3. 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:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test:	3 Hours		



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DEPARTMENT OF PHYSICS  
**APPLIED PHYSICS LAB**  
(Common to Civil and Mechanical Engineering)

SYLLABUS FOR B.E. II SEMESTER

L : T : P(Hrs./week):2: 0 : 0	SEE Marks:50	Course Code: U23BS221PH
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. Study and discuss the characteristics of a given device</li><li>2. Identify probable errors and take in the readings and known possible precautions</li><li>3. Compare the experimental and theoretical values and draw possible conclusions.</li><li>4. Interpret the results from the graphs drawn using experimental values.</li><li>5. Write the record independently with appropriate results.</li></ol>	<ol style="list-style-type: none"><li>1. Conduct experiment independently and in team to record the measurements</li><li>2. Outline the precautions required to be taken for each experiment</li><li>3. Compare the experimental results with standard values and estimate errors</li><li>4. Draw graphs and interpret the results with respect to graphical and theoretical values</li><li>5. Write the summary of the experiment and draw appropriate conclusions</li></ol>

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

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test:	3 Hours		

VASAVI COLLEGE OF ENGINEERING (Autonomous)  
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DEPARTMENT OF MECHANICAL ENGINEERING  
**ENGINEERING WORKSHOP-II**  
(Common to Mechanical, Civil & EEE Branches)

SYLLABUS FOR B.E.II-SEMESTER

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>
1 know basic workshop processes, adopt safety practices while working with various tools	1 create models in Smithy, Welding, fitting and Machining trades by using the relevant tools.
2 identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.	2 measure and inspect the finished components using suitable measuring instruments.

**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. HajraChoudhury S.K., HajraChoudhury 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)

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2 Hours			

