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) III and IV SEMESTER
UNDER CBCS WITH EFFECT FROM 2021–2022
(For the students admitted in 2020-21)

DEPARTMENT OF CIVIL ENGINEERING
+91-40-23146010, 23146011
Fax: +91-40-23146090
Website: www.vce.ac.in

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-20)
B.E. – (CIVIL ENGINEERING) III-SEMESTER ACADEMIC YEAR 2021 - 2022
(Students Admitted in 2020-21)

Course Code	Name of the Course	Scheme of Instruction Hours per Week L	T	P/D	Scheme of Examination Duration in Hrs	Maximum Marks SEE	CIE	Credits
		THEORY						
U20HS010EH	Human Values and Professional Ethics-I	1	-	-	2	40	30	1
U20HS320EH	Skill Development Course-I(Communication Skills in English-I)	1	-	-	2	40	30	1
U20BS310MA	Partial Differential Equations & Transform Calculus	3	-	-	3	60	40	3
U20BS330MA	Skill Development Course-II (Aptitude-I)	1	-	-	2	40	30	1
U20BS310CE	Geology	2	-	-	3	60	40	2
U20ES310EE	Basic Electrical Engineering for Civil Engineers	2	-	-	3	60	40	2
U20PC310CE	Strength of Materials – I	3	-	-	3	60	40	3
U20PC320CE	Surveying	3	-	-	3	60	40	3
U20OE310CE	Open Elective-I	2	-	-	3	60	40	2
U20MC010ME	Introduction to Entrepreneurship	1	-	-	2	40	30	-
		PRACTICALS						
U20ES311EE	Basic Electrical Engineering Lab for Civil Engineers	-	-	2	3	50	30	1
U20PC311CE	Surveying-I Lab	-	-	2	3	50	30	1
U20PC321CE	CAD Lab	-	-	2	3	50	30	1
U20PC331CE	Geology Lab	-	-	2	3	50	30	1
Student should complete one online certificate course equivalent to 2 credits during III-VII Semester								
TOTAL		19	-	8		700	460	22
GRAND TOTAL		27				1180		
Note: The left over hours are to be allotted to ECA-I / CCA-I / Sports / Library / Mentor Interaction / based on the requirement .								

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES
HUMAN VALUES AND PROFESSIONAL ETHICS-1
(Common for All Branches)

Syllabus for BE III-Semester

L: T: P (Hrs/Week): 1	SEE Marks: 40	Course Code: U20HS010EH
Credits: 1	CIE Marks: 30	Duration of SEE: 2 hrs

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

UNIT-1 Understanding the need and process for Value Education
a) Basic Human Aspirations -Philosophy, purpose & objective of Life, Understanding and living in harmony at various levels-with self, family, society and nature.
b) Ethical and moral values - Truth, honesty, empathy, integrity, consistency, cooperation, confidentiality, trustworthiness, self-respect, self-restraint, self-assertion, self-reliance.

UNIT-2Holistic Understanding of Professional Ethics and Human Values
a) At the level of individual: as socially and ecologically responsible engineers and technologists.
b) At the level of society: as mutually enriching organizations, being work conscious
c) Recognizing the value of time and respecting time of self and others.

MODE of DELIVERY

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

Relevant Websites, CD's and Documentaries

- Value Education website, Http://www.universalhumanvalues.info UPTU website, Http://www.uptu.ac.in
- Story of stuff, Http://www.storyofstuff.com
- Al Gore, As Inconvenient Truth, Paramount Classics ,USA
- Charlie Chaplin, Modern Times, United Artists, USA
- IIT Delhi, Modern Technology-The Untold story-Anand Gandhi, Right Here Right Now, Cyclewala production.

Learning Resources:

1. PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
2. B.L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
3. A.N Tripathy, 2003 Human values, New Age International Publishers.
4. EG Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists and Engineers, Oxford University Press.

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-500031

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES
SKILL DEVELOPMENT COURSE- I (COMMUNICATION SKILLS IN ENGLISH-I)

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs/Week) : 1	SEE Marks : 40	Course Code: U20HS320EH
Credits: 1	CIE Marks : 30	Duration of SEE : 2 hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to :-	At the end of this course, the student will be able to
1. Get students proficient in both receptive and productive skills especially virtually	1. Introduce themselves effectively and converse in a formal environment especially in the online space
2. Enable students to understand the importance and method of exchanging information in a formal space- both written and spoken	2. Write emails with appropriate structure and content
3. Introduce students to an ideal structure for a presentation and discussion- individually and in group	3. Use appropriate structure based on the content employing appropriate transitions in written and spoken communication
4. Develop and improve reading skills needed for college work and reproduce the content based on the situational need	4. Paraphrase content and write an effective summary

UNIT 1: Delightful Descriptions
• Introductions on an Online Forum
• Making Observations and Giving Opinion
• Recalling and Describing

UNIT-2: Formal Conversation Skills
• Ask for Information
• Give Information
• Give Feedback
• Seek Permission

UNIT-3: Technical Expositions and Discussions
• Classification
• Sequence
• Compare and Contrast

- Cause and Effect
- Problem and solution

UNIT- 4: Rational Recap
- Paraphrasing
- Summarizing

METHODOLOGY   **ASSESSMENTS**

- Case Studies   - Online assignments
- Demonstration   - Individual and Group
- Presentations
- Expert lectures
- Writing and Audio-visual lessons

Learning Resources:

learn.talentsprint.com

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

1	No. of Internal Tests	:	2	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
PARTIAL DIFFERENTIAL EQUATIONS & TRANSFORM CALCULUS
(Common to Civil, EEE & Mechanical Engineering)

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U20BS310MA
Credits: 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	*At the end of the course students will be able to:*
1. Study the Fourier series, conditions for expansion of function and half range series	1. Expand any function which is continuous, Discontinuous, even or odd in terms of its Fourier series.
2. Formulate and understand linear and nonlinear partial differential equations.	2. Formulate the Partial differential equations by eliminating arbitrary constants and functions and solve linear, non linear Partial differential equations.\
3. Study the applications of Partial Differential equations	3. Solve the one dimensional wave(Vibrations of a string), heat equations and two dimensional heat equations.
4. Understand the Definition of Laplace and inverse Laplace Transforms-Shifting Properties and various theorems and how to apply them in solving Differential Equations.	4. Evaluate Laplace transforms and inverse Laplace transforms of functions. Apply Laplace transforms to solve ordinary differential equations arising in engineering problems.
5. Study the concept of Fourier and inverse Fourier Transform of a function and various properties.	5. Determine Fourier transform, Fourier sine and cosine transform of a function.

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

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

UNIT-III : Fourier Transforms: Fourier Integral Theorem (without Proof) - Fourier Transforms – Inverse Fourier Transform - Properties of Fourier Transform –Fourier Cosine & Sine Transforms.

UNIT –IV : Partial Differential Equations : Formation of first and second order Partial Differential Equations - Solution of First Order Equations – Linear Equation - Lagrange's Equation - Non-linear first order equations – Standard Forms.

UNIT-V : Applications of Partial Differential Equations: Method of Separation of Variables - One Dimensional Wave Equation- One Dimensional Heat Equation – Two Dimensional Heat equation Laplace's Equation-(Temperature distribution in long plates).

Learning Resources:

1. R.K. Jain & S.R.K. Iyengar, Advanced Engineering Mathematics, Third Edition, Narosa Publications, 2007.
2. Higher Engineering Mathematics, Dr.B.S Grewal   40th Edition, Khanna Publishers.
3. Advanced Engineering Mathematics, Kreyszig E, 8 th Edition, John Wiley & Sons Ltd, 2006.
4. A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.
5. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
6. http://mathworld.wolfram.com/topics
7. http://www.nptel.ac.in/course.php

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
SKILL DEVELOPMENT COURSE-II (APTITUDE-I)

SYLLABUS FOR B.E. III-SEMESTER

| L : T : P (Hrs./week):1: 0 : 0 | SEE Marks:40 | Course Code: U20BS330MA |
| Credits: 1 | CIE Marks:30 | Duration of SEE: 2 Hrs |

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	*At the end of the course students will be able to:*
1. This is a foundation course and aims at enhancing employability skills.	1. Solve questions in the mentioned areas using shortcuts and smart methods.
2. Students will be introduced to higher order thinking and problem solving skills in the following areas - Arithmetic Ability, Numerical Ability and General Reasoning.	2. Understand the fundamentals concept of Aptitude skills.
3. Students will be trained to work systematically with speed and accuracy while problem solving.	3. Perform calculations with speed and accuracy.

UNIT 1: QUANTITATIVE APTITUDE - NUMERICAL ABILITY

• Introduction to higher order thinking skills
• Speed Math
• Number systems
• LCM & HCF

UNIT 2: QUANTITATIVE APTITUDE- ARITHMETIC ABILITY FOUNDATION

• Ratio proportions
• Partnership
• Ages
• Allegations and mixtures
• Averages

UNIT 3: QUANTITATIVE APTITUDE

• Percentages
• Profit and loss

UNIT 4: REASONING ABILITY- GENERAL REASONING PART 1

- Blood Relations
- Number Series
- Coding and decoding

UNIT 5: QUANTITATIVE APTITUDE

- Time and Work
- Chain Rule
- Pipes and Cisterns

METHODOLOGY

- Demonstration

- Presentations

- Expert lectures

- Audio-visual lessons

ASSESSMENTS

- Online assignments

- Individual and Group

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

1	No. of Internal Tests	:	2	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 CIVIL ENGINEERING
GEOLOGY

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):2 : 0 : 0	SEE Marks:60	Course Code: U20BS310CE
Credits: 2	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will:	Upon the completion of this course students will be able to:
1. Describe the various properties of minerals, distinguishing features of rocks. 2. Describe the geological structures, processes of weathering and classification of soils. 3. Explain the process of ground water exploration. 4. Illustrate the knowledge of geological studies for dams and reservoirs. 5. Illustrate the knowledge of geological studies for tunnels, list the causes and effects of earth quakes, and landslides with their mitigation measures.	1. Identify the different minerals and distinguishing features exhibited by the rocks 2. Identify the geological structures like folds, faults, joints and unconformities present in rocks and describe the processes of weathering, classify and distribution of soils. 3. Assess the occurrence of ground water in various lithological formations and location of bore wells. 4. Evaluate the suitability of site for the dam construction. 5. Evaluate the suitability of site for the tunnel construction, recognize the causes and effects of earth quakes, and landslides and suggest mitigation measures.

UNIT-I:**Mineralogy:** Definition of mineral and crystal, physical properties used in the identification of minerals, physical properties of quartz, feldspars, hornblende, biotite, muscovite, talc, olivine, calcite, kyanite and garnet.
Rocks: Textures and structures of igneous, sedimentary and metamorphic rocks. Geological description and Indian occurrence of granite, basalt, dolerite, gabbro, laterite, sandstone, shale, limestone, slate, gneiss, quartzite, marble.

UNIT-II: Geological Structures: Classification, mode of origin and engineering importance of folds, faults, joints and unconformities.
Rock Weathering: Processes and end-products of weathering. Susceptibility of rocks to weathering; assessment of the degree of weathering, tests of weatherability.
Geology of Soils: Formation of soils, soil profile, nature of parent materials, relative stability of minerals, geological classification of soils, types of Indian soils.

UNIT-III: Hydrogeology: Hydrological cycle, water table, aquifers, occurrence of ground water in various lithological formations. Ground water movement, springs. Ground water

exploration.

UNIT-IV: Geology for Dams and Reservoirs: Types of dams. Dam foundations and reservoirs. Engineering and geological investigations for a masonry dam site; analysis of dam failures in the past. Engineering geology of major dam sites of India, Reservoir induced seismicity.

UNIT-V: Tunnels: Engineering geological investigations of tunnels in rock; Stand-up time of different rocks. Problems of tunnelling, pay line and over break, logging of tunnels, and geology of some well known tunnels.

Geological Hazards: Geological aspects of earthquakes and landslides.

Learning Resources:
- Parbin Singh, Engineering and General Geology, S.K.Kataria& Sons, 2019
- Chennakesavulu N., Text Book of Engineering Geology, Macmillan India Ltd., 2018
- Gokhale K.V.G.K., Engineering Geology, B.S. Publishers, 2013.
- Bell F.G., Fundamentals of Engineering Geology, Aditya Books Pvt. Ltd., 2007.
- Krynine D.P. and Judd W. R., Principles of Engineering Geology and Geotechnics, CBS Publishers & Distributors, Indian Edition, 2005.
- SubinoyGangopadhyay, Engineering Geology, Oxford University Press, 2013.

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

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

Duration of Internal Tests   :   90 Minutes

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

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

SYLLABUS FOR B.E. III SEMESTER

L: T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code: U20ES310EE
Credits:2	CIE Marks: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	On completion of the course, students will be able to
1 To provide an understanding of basics in Electrical circuits 2 To explain the working principles of Electrical Machines.	1 Aanalyze Electrical circuits to compute and measure the parameters of Electrical Energy. 2 Comprehend the working principles of Electrical DC Machines. 3 Comprehend the working principle of electrical AC machines.

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

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
STRENGTH OF MATERIALS–I

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):3:0:0	SEE Marks:60	Course Code: U20PC310CE
Credits: 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will:	Upon the completion of course students will be able to:
1. Examine and interpret basic concepts of Strength of materials and analyze statically determinate and indeterminate structures. 2. Analyze simple beams subjected to various types of loading and plot shear force and bending moment diagrams and compute bending stresses. 3. Define and analyze shear stresses in beams and plot shear stress distribution across cross section of beams 4. Define and analyze problem of columns subjected to direct and bending stresses 5. Define the concepts of compound stresses and strains in beams and also Investigate the behaviour of thin cylinder, spherical shells and thick cylinders	1. Express understanding of the basic concepts and principles of Strength of materials and solve problems of composite sections, statically determinate and indeterminate structures. 2. Construct shear force and bending moment diagrams for beams and compute stresses and strains in bending and shear in the cross section of beams subjected to transverse loading. 3. Compute direct and bending stresses in columns and beams subjected to eccentric loading. 4. Identify and interpret the governing equation for compound stress and strains and compute the principal stress and strains 5. Compute stresses in thin cylinders, spherical shells and thick cylinders subjected to internal and external pressure.

UNIT-I: **Simple Stresses and Strains:** Definitions, types of stresses and strains. SI units, and notation. Hooke's law, modulus of elasticity, stress-strain curves for mild steel and typical engineering materials. Ductile and brittle materials. Working stress and factor of safety. Deformation of bars under axial loads; prismatic and non-prismatic bars. Deformations due to self-weight. Bars of uniform strength. Poisson's ratio; volumetric strain and restrained strains. Relationship between elastic constants. Compound bars and temperature stresses. Statically indeterminate problems in tension and compression.

UNIT-II: Shear Force and Bending Moment: Definitions. Different types of beams and loads; shears force and bending moment diagrams for cantilever and simply supported beams with and without overhangs subjected to different types of loads viz., point loads, uniformly distributed loads, uniformly varying loads and couples. Relationship between loading, shear force and bending moment.

UNIT-III: Bending Stresses in Beams: Theory of simple bending. Moment of resistance, Elastic section modulus of section. Stresses in beams of various cross sections; flitched beams.
Shear Stresses in Beams: Distribution of transverse shear stresses over rectangular, circular, triangular, I- and T- sections.

UNIT-IV: Direct and Bending Stresses: Distribution of stresses over symmetrical sections under combined axial load and bending moment. Cores of solid and hollow circular and rectangular sections.
Compound stresses and strains: Principal stresses. Ellipse of stress. Mohr's circle for biaxial stresses. Principal strains. Introduction to failure theories.

UNIT-V: Thin Cylinders and spherical shells: Thin Cylinders subjected to internal fluid pressure; wire wound cylinders & shells
Thick Cylinders: Stresses under internal and external pressure. Compound cylinders.

Learning Resources:
1. Ferdinand P. Beer, E. Russell Johnston , John T. Dewolf, Mechanics of Materials, 2017.
2. Ramamrutham S., Narayanan R., Strength of Materials, Dhanpat Rai Publishing Company, New Delhi, 2011.
3. Bansal R.K., A text book of Strength of Materials, Laxmi Publications, New Delhi, 2010.
4. Rajput R.K., Strength of Materials, S.Chand Publications, New Delhi, 2006.
5. Junnarkar S.B., Mechanics of Structures (Vol-I & II), Charotar Publishing House, Anand, 2002.
6. Pytel and Singer F.L., Strength of Materials, Harper & Row, New York, 1999.
7. Subramanian R., Strength of Materials, Oxford University Press, 2010.
8. Hibbeler.R., Mechanics of Materials, Pearson Publishers, 2017.
9. Bhavikatti.S.S, Strength of Materials, Vikas Publishers, 2013.
10. NPTEL Course (www.nptel.ac.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
SURVEYING

SYLLABUS FOR B.E. III-SEMESTER

| L : T : P (Hrs./week):3:0:0 | SEE Marks:60 | Course Code: U20PC320CE |
| Credits: 3 | CIE Marks:40 | Duration of SEE: 3 Hrs |

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	Upon the completion of this course students will be able to
1. Learn the basic concepts and use of surveying in Civil Engineering 2. Understand the measurement techniques and equipment used in land surveying such as chain/tape, compass, plane table and level with respect to equipments used, methods, errors and analysis of data 3. Acquire knowledge on use of theodolite, tacheometer and total station equipment, its adjustments, measurements, methods employed, errors and computation of data. 4. Study the modern techniques in surveying with GPS, aerial photogrammetry, remote sensing,	1. Apply the knowledge, techniques, skills and applicable tools of the surveying to civil engineering projects 2. Estimate the various parameters required for collection of data in the field and correct the data for execution of a project 3. Identify the instruments used, and adopt the principles and methods involved in various surveying techniques for plotting topographical features in the field. 4. Compute area of regular / irregular land from field measurements and volume of the earthwork from cross sections, spot levels and contours. 5. Apply the concepts of modern tools such as GPS, Remote sensing and aerial photogrammetry for measurement of details on surface of earth and relate to civil engineering problems

UNIT-I: Introduction to Surveying: Surveying Objectives, Plane and Geodetic surveying, Principle of surveying, Classification of surveys.
Distance Measurement: Chains and Tapes, Ranging.
Compass Surveying: Measurement of direction and angles. Types of compass, meridians and bearings, Magnetic declination, Dip, local attraction.
Plane Table Surveying: Instruments employed in plane table survey and their use, importance of orientation and different methods of orientation, various methods of plane table survey.

UNIT-II: Levelling: Definitions and principles of levelling, components of various levelling instruments, Terms used in levelling, booking and reduction of levels. Establishment of bench marks by leveling. Longitudinal leveling, Cross-section leveling, Fly levelling, and Reciprocal leveling. Errors in levelling; curvature and refraction corrections.

Contouring: Definition and characteristics of contours, Direct and indirect methods of contouring, Interpolation of contours, Uses of contours.

UNIT-III: Theodolite and Total station surveying: Introduction to theodolite and total station, Electronic distance measurement concepts, Measurement of horizontal and vertical angles, Measurement of distances, Introduction to total station – Concepts, capabilities and functions

Traversing and Computations: Methods of traversing, Checks in open and closed traverse, Computation of latitude and departures, consecutive and independent coordinates, closing error and its adjustment by Bowditch method, Transit rule and Graphical method. Gale's traverse table, omitted measurements in traverse and their computations.Introduction to tacheometry - calculation of distances and elevations when line of sight horizontal and inclined

UNIT-IV: Computation of areas: Simpsons rule, Trapezoidal rule, Meridian distance method, Double meridian distance method, Double parallel distance method, Departure and total latitude method, coordinates method

Computation of volumes: Computation of area of cross section for level section, two level section, three level section and multi level section. Volume of earthwork by trapezoidal and prismoidal method. Volume from spot levels and contour plans

Curves: types of curves, elements of curves, setting of simple curves using linear and angular methods. Introduction toTransition curves, Vertical curves

Unit V : **Advanced Surveying** : Introduction to remote sensing, Elements of remote sensing, Spectral reflectance, GPS- Overview of GPS, Segments of GPS , working principle of GPS/DGPS, Errors in GPS, Photogrammetry – Basic definitions, scale of a vertical photograph, Introduction to UAV systems - classification and applications

Learning Resources:

1. Punmia B.C., Ashok Kumar Jain, Arun Kumar Jain, Surveying, Vol. 1 and 2, Laxmi Publications, 2016.
2. Arora K.R., Surveying, Vol.1, 2 and 3, Standard Publishers Distributors, 2018.
3. Duggal S K, Surveying Volume 1 and 2, Fifth edition, Mc. Graw Hill Education Pvt Ltd 2019.
4. David Clark, Plane and Geodetic Surveying for Engineers, Vol.1 and 2, CBS Publishers and Distributors Pvt. Ltd, 2004.
5. Kanetker T.P. and Kulkarni S.V., Surveying and Levelling, Pune VidyarthiGruhaPrakshan, Pune, 2014.
6. Venkatramaiah C., A Text Book of Surveying, University Press, Hyderabad, 2011.
7. NPTEL course - Surveying course by Prof Bharat Lohani, IIT Kanpur - http://www.nptelvideos.in/2012/11/surveying.html
8. NPTEL course – Digital land Surveying and mapping course by Dr.Jayanta K Ghosh, IIT Roorkee - https://nptel.ac.in/courses/105/107/105107158/

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

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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.III-SEMESTER

L:T:P(Hrs/week):1:0:0	SEE Marks:40	Course Code: U21MC010ME
Credits : --	CIE Marks:30	Duration of SEE: 02Hours

COURSE OBJECTIVE	COURSE OUTCOMES
The objective of the course is to	On completion of the course, students will be able to
Inspire students to 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-a problem solving process, 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", 3rd 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
2. Peter F. Drucker, "Innovation and Entrepreneurship", Routledge Classics, 2015.
3. Eric Ries, "The Lean Start-up", Currency, 1st edition, 2011.
4. 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 ELECTRICAL AND ELECTRONICS ENGINEERING
BASIC ELECTRICAL ENGINEERING FOR CIVIL ENGINEERS LAB

SYLLABUS FOR B.E. III SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks:50	Course Code: U20ES311EE
Credits :01	CIE Marks:30	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES On completion of the course, students will be able to
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 Kirchoff's Voltage Law & Kirchoff's Current Law   Verification of mesh and
3   nodal analysis.

4   Sinusoidal steady state response of R-L, and R-C circuits – Measurement of phase angle

5   Measurement of cumulative three-phase power in balanced three-phase circuits.

6   Improvement of power factor in RLC circuits.

7   Demonstration of cut-out sections of machines: dc machine (commutator-brush arrangement), induction machine (squirrel cage rotor).

8   Torque Speed Characteristic of dc shunt motor

9   Speed control of dc shunt motor

10   Torque-Slip Characteristic of a three-phase induction motor

11   Measurement of electrical energy

From the above experiments, 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)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING
SURVEYING-I LAB

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):0:0:2	SEE Marks:50	Course Code: U20PC311CE
Credits: 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course students will be able to
1. Develop skills for applying classroom knowledge to field problems and handling of surveying tools such as chain, compass, level, plane table and theodolite.	1. Locate the objects, measure the distances and area and transfer the same on to the drawings 2. Use conventional surveying tools such as chain, compass, level, plane table and theodolite in the field of civil engineering applications such as structural plotting and highway profiling 3. Practice working as a team member and lead a team 4. Plan a survey appropriately with the skill to understand the surroundings 5. Demonstrate professional behaviour in conducting the experiments and present the results effectively

LIST OF EXPERIMENTS
1. Practice of direct and indirect ranging and measuring the distance using Chain.
2. Traversing by using Compass – plotting and adjustments.
3. Plane table surveying - Radiation and Intersection methods.
4. Plotting of the traverse for the given area using plane table.
5. Introduction to Levelling – Fly leveling using Auto Level
6. Profile leveling using auto level - Plotting Longitudinal section and Transverse sections
7. Measurement of horizontal angles by repetition & Reiteration method using Theodolite and calculate the area.
8. Traversing by using Theodilite – Distribution of errors using gales Traverse table
9. Measurement of vertical angle; Application to simple problems of height and distance by measuring angle of elevation.
10. Single plane method: Determination of RL of an elevated object using 2 instrument station which are placed in same vertical plane when object is in accessible
11. Two plane method: Determination of R.L of an elevated object using two instrument stations which are not placed are not placed in the same vertical plane when base of the object inaccessible

12. Demonstration of minor surveying instruments

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 CIVIL ENGINEERING
CAD LAB

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):0:0:2	SEE Marks:50	Course Code: U20PC321CE
Credits : 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	*Upon the completion of this course students will be able to*
1. Develop skills to generate civil engineering drawings using a drafting software. 2. Learn various tools and functions of the drafting software.	1. Understand functional planning & orientation of the buildings. 2. Navigate the drafting software user interface. 3. Learn basic tools of the software. 4. Apply the fundamental features of drafting software in a practical situation. 5. Prepare civil engineering drawings in a detailed and visually impressive way.

LIST OF EXPERIMENTS

1. Building Planning & Orientation: Functional planning of buildings and Orientation of the building for ventilation.

2. CAD: Introduction to Computer Aided Drafting, Advantages and Disadvantages of CAD, List of CACED Software. Introduction and feature of drafting software.

3. Environment of drafting software: Workspace, Application Menu, Quick Access Toolbar, Ribbon, Search for information, Pull-down menu, Status bar, Function keys.
 Coordinate systems: absolute and relative, Cartesian and polar coordinate systems.

4. Basic Managing/ Display control Tools: New, Save, new, Open, Close, Quit/ Exit, Undo, Redo, Limits, Units, Zoom, Pan, Steering Wheel, View Cube etc.
 Basic Drafting Tools: Line, Polylines, Point, Circle, Arc, Spline, Ellipse, Rectangle, Polygons, Text, Hatch.

5. Editing/ Inquiry Tools: Erase, oops, Move, Copy, Mirror, Rotate, Scale, Fillet, Chamfer, Trim, Extend, Break, Join, Stretch, Offset, Array, Distance, Radius, Angle, Area, Volume.

6. Dimensioning Tools: Linear, Aligned, Radius, Diameter, Centre, Angular, Baseline, Continuous, Ordinate, Arc Length, Jogged Radius Dimension, Dimension Space, Dimension Break, Inspection Dimension, Multileader and its Style.

7. **Layer Tools:** Concepts and use of Layers in drafting software, drawing, Adding New layers, Editing and Managing Layers, List Properties, Use of Different Types of lines and their weightages.

   Block/W-block and Attributes: Concept and Significance of Blocks in drafting software Drawings, Creating Blocks, Editing and Managing Blocks

8. Drawing of Plans, Elevations and Sections of various types of single Storey Residential Buildings.

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 CIVIL ENGINEERING
GEOLOGY LAB

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):0:0 :2	SEE Marks:50	Course Code: U20PC331CE
Credits: 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Familiarize with the procedures for the identification of minerals, rocks and structural models. 2. Calculate the specific gravity, porosity and water absorption in rocks. 3. Operate electrical resistivity meter and seismic timer. 4. Describe the various types of maps. 5. Measure the attitude of beds and draw the sections for geological maps.	1. Identify the physical properties of minerals, rocks and various structural features like folds, faults and unconformities. 2. Calculate the specific gravity, porosity and water absorption in rocks, operate electrical resistivity meter and seismic timer, study of various types of maps. 3. Draw the sections for the geological maps pertaining to the study of folds, faults and unconformities. 4. Practise working as a team member and lead a team 5. Demonstrate professional behaviour in conducting the experiments and present the results effectively

LIST OF EXPERIMENTS

1. Identification and description of physical properties of minerals.

2. Identification and description of geotechnical characteristics of rocks.

3. Determination of apparent specific gravity, porosity and water absorption of different rocks; IS:1124 - 1974.

4. Study of structural models; folds, faults and unconformities.

5. Measurement of strike and dip of joints in granites using clinometer compass.

6. Study of geological and geotechnical maps of Telangana, Andhra Pradesh and India.

7. Study of Topographic maps.

8. Study of maps and sections pertaining to the study of folds, faults and unconformities.

9. Vertical electrical sounding.

10. Seismic refraction survey

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)
DEPARTMENT OF CIVIL ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION (R-20)
B.E. – (CIVIL ENGINEERING) III-SEMESTER ACADEMIC YEAR 2021 - 2022
(Students Admitted in 2020-21)

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	
THEORY (Mech.)								
U20ES310CE	Mechanics of Materials	3	-	-	3	60	40	3
PRACTICALS (Mech.)								
U20ES311CE	Mechanics of Materials Lab	-	-	2	3	50	30	1

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

DEPARTMENT OF CIVIL ENGINEERING
MECHANICS OF MATERIALS

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U20ES310CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	Upon the completion of this course students will be able to
1. Learn the analysis of members subjected to axial and transverse loads. 2. Assess the behavior of columns subjected to axial loads and compute stresses in beams due to bending. 3. Analyse the stresses developed in shafts, springs due to torsion and internal pressure in cylinders.	1. Analyse members subjected to axial loads including thermal effects using basic concepts of Mechanics of materials. 2. Draw shear force and bending moment diagrams in statically determinate beams. 3. Compute stresses and strains in bending, shear and principal stresses. 4. Determine the deflection of statically determinate beams subjected to UDL and point loads using double integration method and apply Euler's theory for long columns. 5. Compute stresses in circular shafts for torsion, springs subjected to axial load and stresses induced in cylinders.

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

UNIT-II: Shear Force and Bending Moment: Bending moment and shear force diagrams for cantilever, simply supported beams and beams with overhangs carrying point and uniformly distributed loads. Relationship between intensity of loading, shear force and bending moment.

UNIT-III:Stresses in Beams: Simple theory of bending. Moment of resistance. Modulus of section. Distribution of shear stresses in rectangular, I- and T-, standard steel and hollow sections. Compound stresses, principal stresses and strains. Mohr's circle of stress.

UNIT-IV:Deflections: Slope and deflections by the method of double integration in cantilever, simply supported beams and beams with over hangs subjected to point loads and uniformly distributed loads.
Columns: Euler's theory of long columns with axial load.
UNIT-V: Torsion: Derivation of torsion formula for circular sections. Torsional stresses, angle of twist, power transmission, effect of combined bending and torsion. Close coiled helical springs with axial load.

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

Learning Resources:
1. Ferdinand P. Beer, E. Russell Johnston, John T. Dewolf, Mechanics of Materials, 2017.
2. Ramamrutham S., Narayanan R., Strength of Materials, Dhanpat Rai Publishing Company, 2011.
3. Bansal R.K., A text book of Strength of Materials, Laxmi Publications, 2010.
4. Rajput R.K., Strength of Materials, S.Chand Publications, 2006.
5. Junnarkar S.B., Mechanics of Structures (Vol-I & II), Charotar Publishing House, Anand, 2002.
6. Pytel and Singer F.L., Strength of Materials, Harper & Row, New York, 1999.
7. Subramanian R., Strength of Materials, Oxford University Press, 2010.
8. Hibbeler.R., Mechanics of Materials, Pearson Publishers, 2017
9. Bhavikatti.S.S, Strength of Materials, Vikas Publishers, 2013

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
MECHANICS OF MATERIALS LAB

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week)0 : 0 : 2	SEE Marks:50	Course Code: U20ES311CE
Credits : 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Determine the properties of materials under the action of various loads. 2. Learn the ability to work in a team and make effective presentations.	1. Determine Young's Modulus of materials of beams by conducting deflection test. 2. Assess the quality of materials by conducing hardness test and impact test and also learn the operation of universal testing machine (UTM). 3. Determining modulus of rigidity of materials by conducting torsion test and spring test. 4. Practise working as a team member and lead a team. 5. Demonstrate professional behaviour in conducting the experiments and presenting the results effectively.

List of Experiments
1. Determination of Young's modulus by conducting Deflection test on Cantilever beam
2. Determination of Young's modulus by conducting Deflection test on Simply supported beam
3. Izod Impact test
4. Direct tension test on metal rods
5. Brinnell and Rockwell Hardness test
6. Compression test on brittle and ductile materials
7. Determination of modulus of rigidity by conducting tension test on a helical spring
8. Determination of modulus of rigidity by conducting compression test on a helical spring
9. Determination of modulus of rigidity by conducting torsion test
10. Determination of modulus of elasticity by conducting deflection test on fixed beam
11. Determination of modulus of elasticity by conducting deflection test on continuous beam
12. Bend test on metal rod.

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)
DEPARTMENT OF CIVIL ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION (R-20)
B.E. – (CIVIL ENGINEERING) III-SEMESTER (BRIDGE COURSE)
ACADEMIC YEAR 2021 - 2022
(Lateral Entry Students Admitted in 2021-22)

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	
THEORY								
UB20ES320CS	Computer Programming	2	-	-	3	50	-	-
UB20ES340CE	Mechanics for Engineers	2	-	-	3	50	-	-

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COMPUTER PROGRAMMING
SYLLABUS FOR BRIDGE COURSE B.E. III-SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks : 50	Course Code :**UB20ES310CS**
Credits :--	CIE Marks : --	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Acquire problem solving skills 2. Develop flow charts 3. Understand structured programming concepts 4. Write programs in C Language	On completion of the course, students will be able to 1. Design flowcharts and algorithms for solving a problem and choose appropriate data type for writing programs in C language 2. Design modular programs involving input output operations, decision making and looping constructs 3. Apply the concept of arrays for storing, sorting and searching data 4. Apply the concept of pointers for dynamic memory management and string handling 5. Design programs to store data in structures and files

UNIT-I
Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Flowcharts.
Introduction to C Language- Background, C Programs, Identifiers, Types, Variables, Constants, Input/Output, Expressions, Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion, Statements, Bitwise Operators.

UNIT-II
Selection: Logical Data and Operators, if... else, switch Statements, Standard Functions.
Repetition: Loops, while, for, do-while Statements, Loop Examples, break, continue, goto.
Functions: Designing Structured Programs, Functions Basics, User Defined Functions.

UNIT-III
Recursion-Recursive Functions, Preprocessor Commands.
Arrays: Two-Dimensional Arrays, Linear Search and Binary Search, Selection Sort and Bubble Sort.

UNIT-IV
Pointers: Introduction, Pointers to Pointers, Arithmetic operations using pointers
Strings – Concepts, C Strings, String Input/output, Functions, Arrays of Strings, String Manipulation Functions.

UNIT-V

Structure: Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Unions.

Input and Output: Files, Streams, Standard Library Input/Output Functions, Character Input/Output Functions.

Learning Resources:

1. B. A. Forouzan& Richard F. Gilberg, "A Structured Programming Approach using C", 3rd Edition, Cengage Learning, 2013.
2. Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", 2nd Edition, Prentice-Hall, 2006.
3. Rajaraman V, "The Fundamentals of Computer", 4th Edition, Prentice-Hall of India, 2006.
4. Steve Oualline, "Practical C Programming", 3rd Edition, O'Reilly Press.
5. Jeri R. Hanly, Elliot B. Koffman, "Problem Solving and Program Design in C", 5th Edition, Pearson Education, 2007.
6. E. Balagurusamy, "Programming in ANSI C", 4th Edition, TMG, 2008.
7. Gottfried, "Programming with C", 3rd Edition, TMH, 2010.
8. R G Dromey, "How to Solve it by Computer", 1st Edition, Pearson Education, 2006.

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

DEPARTMENT OF CIVIL ENGINEERING
MECHANICS FOR ENGINEERS
(Civil, Mech., & EEE)

SYLLABUS FOR BRIDGE COURSE B.E. III-SEMESTER

L : T : P (Hrs./week):2:0:0	SEE Marks:50	Course Code: UB20ES340CE
Credits : - - -	CIE Marks: - - -	Duration of SEE: 3 Hrs

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

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

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

UNIT-III: Friction: Laws of friction, application to simple systems and wedge friction.

UNIT-IV: Kinematics: Rectilinear motion, curvilinear motion, velocity and acceleration of a particle.

UNIT-V: Kinetics: Analysis as a particle, analysis as a rigid body in translation.

Learning Resources:
1. Singer F.L., "Engineering Mechanics", Harpper & Collins, Singapore,2010.
2. Timoshenko S.P. and Young D.H., "Engineering Mechanics", McGraw Hill International Edition, 2014.
3. Andrew Pytel, Jaan Kiusalaas., "Engineering Mechanics", Cengage Learning, 2014.
4. Beer F.P. and Johnston E.R., "Jr. Vector Mechanics for Engineers", TMH, 2004.

5. Hibbeler R.C. & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2008.
8. Meriam. J. L., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2008.
9. NPTEL Course (www.nptel.ac.in)
10. Virtual labs (www.vlab.co.in)

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN
B.E. III SEMESTER (2021-22)

Dept	Title	Code	credits
CIVIL	Green Building	U20OE310CE	2
CSE	Principles Of Python Programming	U200E310CS	2
CSE	Cyber Security	U200E320CS	2
ECE	Introduction to Signals & Systems	U20OE310EC	2
ECE	Principles of Communication Engineering	U20OE320EC	2
EEE	Non Conventional Energy Sources	U20OE310EE	2
Mech.	Geometric Modelling	U20OE310ME	2
Mech.	Introduction to Unmanned Aeiral Vehicle	U20OE320ME	2
Mech.	Basic Heat Transfer for Electronic Systems	U20OE330ME	2
IT	Object Oriented Programming Using Java	U20OE310IT	2
IT	Introduction To Scripting Languages	U20OE320IT	2
Maths	Linear Algebra	U190E310MA	2
Chemistry	Battery science and Technology	U21OE31OCH	2
Physics	Smart Materials & Applications	U19OE31OPH	2
H&SS	Learning to Learn	U20OE310EH	2

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

DEPARTMENT OF CIVIL ENGINEERING
GREEN BUILDINGS (Open Elective-I)

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):2:0:0	SEE Marks:60	Course Code: U20OE310CE
Credits: 2	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Learn the principles of planning and orientation of buildings. 2. Environmental implications of natural and building materials along with green cover 3. Acquire knowledge on various aspects of green buildings	1. Explain the principles of building planning, its bylaws and provide facilities for rainwater harvesting 2. Relate safety to Green Technology 3. Understand the concepts of green buildings 4. Understand rating systems of GRIHA and LEED

UNIT-I: Planning of buildings: Principles of planning, Relevant building bylaws, site selection for buildings, orientation of buildings, Provision of rain water harvesting

UNIT-II: Building-Energy-Implications: Environmental implications of buildings energy, carbon emissions, water use, waste disposal; Building materials: sources, methods of production and environmental Implications. Green cover and built environment

UNIT-III: Green Building Technologies: Introduction- Necessity - Concept of Green building. Principles of green building – Site selection criteria for Green Buildings – effective cooling and heating systems – effective electrical systems effective water conservation systems

UNIT-IV: Certification Systems: Certification systems- Green Rating for Integrated Habitat Assessment (GRIHA), Indian Green Building Council (IGBC) and Leadership in Energy and Environmental Design (LEED), case studies

Learning Resources:
1. Kumara Swamy N.Kameswara Rao A., Building Planning And Drawing, Charotar, Publications, 2013.
2. Shahane, V. S, "Planning and Designing Building", Poona, Allies Book Stall, 2004.
3. Michael Bauer, Peter Mösle and Michael Schwarz "Green Building – Guidebook for Sustainable Architecture" Springer, 2010.
4. Tom Woolley, Sam Kimmins, Paul Harrison and Rob Harrison "Green Building Handbook" Volume I, Spon Press, 2001.
5. Mili Majumdar, "Energy-efficient buildings in India" Tata Energy Research Institute, 2002.
6. TERI "Sustainable Building Design Manual- Volume I & II" Tata Energy Research Institute,

2009.

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	:	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 COMPUTER SCIENCE & ENGINEERING
PRINCIPLES OF PYTHON PROGRAMMING(OPEN ELECTIVE-I)
(Common for CIVIL, ECE, EEE & MECH)
SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks : 60	Course Code :**U200E310CS**
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*	
1	Acquire problem solving skills	1	Design python programs using arithmetic expressions and decision making statements
2	Learn programming and solve problems using Python language	2	Design modular python programs using functions
		3	Develop programs using strings and list
		4	Develop programs using tuples and dictionaries

UNIT-I: **Introduction to Python**: Variables, expressions and statements, order of operations

Conditionals: Modulus operators, Boolean expressions, logical operators, conditional execution, alternative executions, chained conditional, nested conditional

Iteration: while statement

UNIT-II: Functions: function calls, type conversion and coercion, mathematical functions, User-defined functions, parameters and arguments.
Recursion

UNIT-III: Strings: string length, string traversal, string slices and string comparison with examples, strings are immutable, find function, string module

List: list values, accessing elements, list traversal, list length, list membership, list and for loop, list operations with examples

UNIT-IV: **Tuples**: Mutability, tuple assignment, tuple as return values

Dictionaries: dictionary operations, dictionary methods, aliasing and copying, counting letters using dictionaries

Learning Resources:
1. Downey A, How to think like a Computer Scientist :Learning with Python, 1st Edition(2015), John Wiley
2. Lambert K.A, Fundamentals of Python –First Programs, 1st Edition(2015), Cengage Learning India
3. Perkovic L, Introduction to Computing using Python,2/e, (2015), John Wiley
4. Stewart Venit and Elizabeth Drake, Prelude to Programming: Concepts and Design, 6th Edition(2015),Pearson India
5. Mark J Guzdial, Introduction to Computing and programming in Python, 3rdEdition(2013), Pearson India
6. Allen Downey, Think Python, 2nd Edition(2015),Shroff Publisher Orielly
7. http://nptel.ac.in/courses/117106113/34
8. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-01sc-introduction-to-electrical-engineering-and-computer-science-i-spring-2011/python-tutorial/
9. www.scipy-lectures.org/intro/language/python_language.html

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 COMPUTER SCIENCE & ENGINEERING
CYBERSECURITY (OPEN ELECTIVE-I)
(Common for CIVIL, ECE, EEE & MECH)

SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks : 60	Course Code :**U200E320CS**
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 To safeguard from threats and infection spread through the internet	1 Explain the concepts of confidentiality, availability and integrity 2 Explain the basics of fraud techniques used by a hacker 3 Explore the common exploitation mechanisms and inspect data sniffing over the network 4 Determine the ways an organization attempts to discover threats.

UNIT-I: **CYBER SECURITY FUNDAMENTALS:** Network and Security concepts: Information assurance fundamentals, Basic Cryptography, Symmetric Encryption, Public key encryption, Digital Signature, Key Exchange Protocols, DNS, Firewalls, Virtualization.

UNIT-II: ATTACKER TECHNIQUES AND MOTIVATIONS: How hackers cover their tracks, Tunneling techniques, Fraud Techniques: Phishing, Smishing, Vishing and Mobile Malicious Code, Rogue Antivirus, Click Fraud, Threat Infrastructure: Botnets, Fast-Flux, Advanced Fast-Flux.

UNIT-III: EXPLOITATION: Techniques to gain foothold: Shellcode, Integer overflow, Stack based buffer overflow, Format String Vulnerabilities, SQL Injection, Web Exploit Tools, Misdirection, Reconnaissance, and Disruption Methods

UNIT-IV:**MALICIOUS CODE, DEFENSE & ANALYSIS TECHNIQUES:** Self-replicating replicating code, Worms, Viruses, Evading Detection and Elevating Privileges: Obfuscation, Spyware, Token Kidnapping, Memory Forensics, Honeypots, Malicious code naming, Intrusion detection systems

Learning Resources:

1. James Graham, Ryan Olson, Rick Howard, "Cyber Security Essentials", Auerbach Publications , CRC Press, 2011
2. Mike Shema, "Anti-Hacker Tool Kit (Indian Edition)", Mc Graw Hill, 2014
3. Cyber Security - Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and SunitBelpure, Publication Wiley , 2011
4. https://www.edx.org/micromasters/ritx-cybersecurity
5. https://www.coursera.org/specializations/cyber-security
6. http://nptel.ac.in/courses/106105031/
7. https://www.netacad.com/courses/security/introduction-cybersecurity

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	:	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 ELECTRONICS AND COMMUNICATION ENGINEERING

INTRODUCTION TO SIGNALS & SYSTEMS (OPEN ELECTIVE)

SYLLABUS FOR B.E. III – SEMESTER (for CSE & IT)

L:T:P (Hrs./week) : 2:0:0	SEE Marks : 60	Course Code: **U20OE310EC**
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Define and classify continuous and discrete time signals and systems. 2. Determine frequency domain characteristics of continuous and discrete time signals.	*On completion of the course, students will be able to* 1. Analyze basic signals and systems in continuous and discrete time domain 2. Apply the properties of different transformation techniques to analyze continuous time domain signals and systems in frequency domain 3. Determine the response of an LTI system using Convolution 4. Apply the properties of different transformation techniques to convert a discrete time domain signal to frequency domain

UNIT - I
Continuous time signals: types of signals, representation of signals, basic elementary signals, operations on signals.
Continuous time systems: classification of systems - static and dynamic, linear and non linear, time invariant and time variant.
UNIT - II
Continuous time Fourier transforms: Introduction, existence, properties, magnitude and phase spectrums.
Laplace transforms: Introduction, existence, Laplace transform of basic elementary signals, properties, inverse Laplace transforms
UNIT - III
Discrete time signals: types of signals, representation of signals, basic elementary signals, operations on signals.
Discrete time systems: classification of systems - static and dynamic, linear and non linear, time invariant and time variant.
UNIT - IV
LTI Systems: Introduction to continuous and discrete time LTI systems, properties, impulse response, convolution, causality, stability, transfer function.
Z-transform: Introduction, existence, Z-transform of basic elementary signals, properties, inverse Z-transforms.
Applications: Basic network Analysis, Servo Motor
Learning Resources:
1. P. Ramakrishna Rao, Signals and Systems,McGraw Hill, 2008.
2. Alan V. Oppenheim, Alan S. Wilsky and S. Hamid Nawab, Signals and Systems, 2nd ed., PHI, 2009.
3. Nagoor kani , Signals and Systems McGraw Hill, 2013
4. https://onlinecourses.nptel.ac.in/noc19_ee07/preview
   (Principle of Signals and Systems by Prof. Aditya K Jagannatham
5. https://www.edx.org/course/signals-and-systems-part-1-1
6. https://www.edx.org/course/signals-systems-part-2-iitbombayx-ee210-2x-3

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 ELECTRONICS AND COMMUNICATION ENGINEERING
PRINCIPLES OF COMMUNICATION ENGINEERING (OPEN ELECTIVE)
SYLLABUS FOR B.E. III – SEMESTER (for EEE, CSE & IT)

L:T:P (Hrs./week) : 2:0:0	SEE Marks : 60	Course Code: **U20OE320EC**
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Distinguish analog and digital Modulation techniques used in various Communication systems.	*On completion of the course, students will be able to* 1. Analyze the power and transmission bandwidth of Amplitude and Frequency Modulated signals. 2. Familiarize the process of reproduction of base band signal. 3. Analyze various pulse analog and pulse digital Modulation Techniques. 4. Understand the transmission of binary data in communication systems.

UNIT - I
Amplitude Modulation: Introduction to Modulation, Need for Modulation, Ordinary Amplitude Modulation – Modulation index, Side bands, AM Power, Double Side Band Suppressed Carrier Modulation, Single Side Band Modulation, Vestigial Side Band Modulation, AM demodulation, Applications of AM.

UNIT - II
Angle Modulation: Angle Modulation fundamentals, Frequency Modulation – Modulation index and sidebands, Narrowband FM, Wideband FM, Principles of Phase Modulation, Frequency Modulation verses Amplitude Modulation, FM demodulation, Frequency Division Multiplexing, Applications of FM.

UNIT - III
Signal Sampling and Analog Pulse Communication: Ideal Sampling, Pulse Amplitude Modulation, Pulse Width Modulation, Pulse Position Modulation.
Digital Communication Techniques: Quantization, Digital Transmission of Data, Parallel and Serial Transmission, Data Conversion, Time Division Multiplexing, Pulse Code Modulation, Delta Modulation.

UNIT - IV
Transmission of Binary Data in Communication Systems: Digital Codes, Principles of Digital Transmission, Transmission Efficiency, Modem Concepts and Methods – FSK, BPSK, Error Detection and Correction.

Learning Resources:
1. Louis E. Frenzel, Principles of Electronic Communication Systems, 3rd Edition. Tata Mcgraw Hill.
2. Wayne Tomasi, Electronic Communications Systems, 5th Edition, Pearson Education.

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 ELECTRICAL AND ELECTRONICS ENGINEERING
Non Conventional Energy Sources
Open Elective-I
SYLLABUS FOR B.E. III SEMESTER

L: T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U20OE310EE**
Credits:2	CIE Marks: 40	Duration of SEE: 3Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
To provide a survey of the most important renewable energy resources and the technologies for harnessing these resources within the framework of a broad range of simple to state- of -the-art energy systems.	1. Demonstrate the generation of electricity from various Non-Conventional sources of energy and solar power generation 2. Illustrate the generation of energy from wind and generation of energy from waste 3. Demonstrate the generation of energy by biomass and fuel cells 4. Illustrate the ocean and geo thermal energy generation

UNIT-I: Introduction and Solar Energy:
Introduction: Need for Non-conventional energy sources, Types of Non-Conventional energy sources. Renewable energy across the Global and in India. Renewable energy for rural applications, Renewable energy for urban, industrial and commercial applications
Solar Energy: Solar cell fundamentals: Semiconductors, Photovoltaic effect, Solar PV cell, module, panel, array, Solar cell operating characteristics: Voltage-current characteristic, energy losses, maximising the performance. Applications of solar energy, Solar energy program in India, Case study

UNIT-II: Wind Energy and Waste to Energy:
Wind Energy: Nature of wind, Basic components of Wind Energy Conversion System(WECS), Power extraction from the wind, Applications of wind energy. Wind energy program in India, Case Study
Waste to Energy: Key issues, Waste recovery management, Case study
UNIT-III: Biomass Energy and Fuel Cells:
BiomassEnergy: Definition, Bio fuels, Biomass resources, Biomass conversion technologies: Incineration- Thermo chemical conversion- Bio- chemical conversion. Advantages and disadvantages of biomass energy, Case study
Fuel Cells: Definition-Classification of fuel cells, Principle of operation, Hydrogen-oxygen fuel cell, Alkaline fuel cell, Proton exchange membrane fuel cell, Molten carbonate fuel cell, Solid oxide electrolyte cells, Comparison of fuel cells-Advantages and Disadvantages of fuel cells-Applications of Fuel cells. Case study

UNIT-IV: Ocean Energy and Geothermal Energy:
Ocean Energy: Ocean thermal electric conversion (OTEC) methods: Open cycle and Closed cycle- Principles of tidal power generation-Advantages and limitations of tidal power generation, Case study
Geothermal Energy: Geothermal resources- Vapour dominated geothermal plant- Liquid dominated geothermal plant-Applications of Geothermal Energy, Case study

Learning Resouces:
1. B H KHAN, Non-Conventional Energy Resources, McGraw Hill, 2nd Edition, 2009.
2. G. S. Sawhney, Non-Conventional Energy Resources, PHI Learning Pvt Ltd, 2012
3. ShobhNath Singh, Non-Conventional Energy Resources, Pearson, 2016
4. G.D. Rai, Non-Conventional Energy Sources ,Khanna Publishers, New Delhi, 2011.
5. Ashok Desai V, Non-Conventional Energy, Wiley Eastern Ltd, 1990.
6. Mittal K.M, Non-Conventional Energy Systems, Wheeler Publishing Co. Ltd, 1997.
7. Ramesh R, Kurnar K.U, Renewable Energy Technologies, Narosa Publishing House, New Delhi, 1997.
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	:	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)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MECHANICAL ENGINEERING
GEOMETRIC MODELLING (Open Elective-I)

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U20OE310ME**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
The objective of this course is to understand wire-frame modelling & transformations, surface, solid modelling and assembly modelling techniques.	1. define various geometric modelling techniques and development of wire frame modelling for synthetic entities by using mathematical equations. 2. formulate 2D transformations for geometric model by matrix approach. 3. development of various surfaces using surface modelling. 4. development of solid models using various solid modelling schemes and Study various Assembly constraints, Assembly tree and develop few assembled models.

UNIT-I: INTRODUCTION TO CAD
product life cycle, conventional design and computer aided design.
Wire Frame Modelling: wire frame entities and their definitions. Interpolation and approximation of curves. Concept of parametric and non–parametric representation of circle and helix curves, demonstration of 2D geometry through CAD software.

UNIT-II:SYNTHETIC CURVES
Parametric representation of cubic spline, Bezier and B– spline curves, continuity, properties and characteristics of splines. Concepts of NURBS, synthetic curves demonstration.

2D transformation and their mathematics: Translation, scaling, rotation, Homogeneous co-ordinates, Concatenated transformations.

UNIT-III: SURFACE MODELING
Analytical surfaces: Definitions of planar, surface of revolution, Tabulated cylinder. Synthetic surfaces: Cubic and Bezier surfaces, visualization of different surfaces.

UNIT-IV: **SOLID MODELLING**
C– rep and B– rep and feature instancing, Octree encoding, spatial enumeration, cell decomposition, sweeping approaches. Euler's representation of solid models, creation of solid model in CAD software.
ASSEMBLY MODELING: Assembly constraints, assembly tree, top down assembly, bottom up assembly, development of a history tree for a simple assembly, demonstration of simple assembly.
Learning Resources:
1. Ibrahim Zeid, "CAD/CAM- Theory and Practice", McGraw-Hill Inc. New York, 2011.
2. Steven Harrington, "Computer graphics: a programming approach", McGraw-Hill, 1987.
3. David Rogers, J. Alan Adams, "Mathematical elements for computer graphics", McGraw Hill, 1990.
4. McConnell, J. J. "Computer graphics theory into practice", Jones and Bartlett Publishers, 2006.

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	:	2	Max. Marks for each Assignment	:	5
3.	No. of Quizzes	:	2	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes

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

DEPARTMENT OF MECHANICAL ENGINEERING
INTRODUCTION TO UNMANNED AERIAL VEHICLES (Open Elective-I)
SYLLABUS FOR B.E.III-SEMESTER

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: **U20OE320ME**
Credits :02	CIE Marks:40	Duration of SEE: 03Hours

COURSE OBJECTIVE	COURSE OUTCOMES
	On completion of the course, students will be able to
The objective of this Course is to understand the features of UAV, elements, navigation and guidance of UAV and to design and silmulate UAV	1. Explain the types and characteristics of UAVs and their applications.
	2. Illustrate the concepts of aerodynamics of flight vehicle.
	3. Identify and explain the components, sensors and payload of UAVs, their navigation and guidance.
	4. Design and perform structural, aerodynamic analysis of UAV components

Unit-I: Introduction to UAV
UAV: Definition, History; Difference between aircraft and UAV; DGCA Classification of UAVs; Types and Characteristics of Drones: Fixed, Multi-rotor, and Flapping Wing; Applications: Defense, Civil, Environmental monitoring.

Unit-II: Basics of Flight
Different types of flight vehicles; Components and functions of an airplane; Forces acting on Airplane; Physical properties and structure of the atmosphere; Aerodynamics – aerofoil nomenclature, aerofoil characteristics, Angle of attack, Mach number, Lift and Drag, Propulsion and airplane structures.

Unit-III: UAV Elements, Navigation and Guidance
Components: Arms, motors, propellers, electronic speed controller (ESC), flight controller; Propulsion; Data Link; Sensors and Payloads: GPS, IMU, Light Detection and Ranging (LiDAR), Imaging cameras, Classification of payload based on applications; Hyper-spectral sensors; Laser Detection and Range (LADAR); Synthetic Aperture Radar (SAR); Thermal cameras; ultra-sonic detectors; Case study on payloads. Introduction to navigation systems and types of guidance; Mission Planning and Control.

Unit-IV: Design & Simulation of UAV
Introduction to CAD; Design of UAV components; Structural Analysis using CAE; Aerodynamic Analysis using CFD; Manufacturing of the components of UAVs: 3D printing; Case studies;

Learning Resources:
1. Andey Lennon, "Basics of R/C Model Aircraft Design" Model Airplane News Publication
2. John Baichtal, Building Your Own Drones: A Beginners' Guide to Drones, UAVs, and ROVs.
3. K Valavanis, George J Vachtsevanos, Handbook of Unmanned Aerial Vehicles, New York, Springer, Boston, Massachusetts : Credo Reference, 2014. 2016.
4. DGCA RPAS Guidance Manual, Revision 3 - 2020

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

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

Duration of Internal Test: 90 minutes

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

DEPARTMENT OF MECHANICAL ENGINEERING
BASIC HEAT TRANSFER FOR ELECTRONIC SYSTEMS (Open Elective-I)

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U20OE330ME**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES On completion of the course, students will be able to
The objective of this course is to study the basic laws of thermodynamics and the cooling of electronic equipment along with basic modes of heat transfer	1. understand and apply the first law of thermodynamics to various engineering problems 2. understand and apply the second law of thermodynamics to various engineering problems 3. formulate heat conduction problems in rectangular, cylindrical and spherical coordinate system by transforming the physical system into a mathematical model. 4. analyse heat transfer processes involved in cooling of electronic components

UNIT-I: INTRODUCTION TO THERMODYNAMICS

Basic Concepts-System, Types of Systems, Control Volume, Surrounding, Boundaries, Universe, Macroscopic and Microscopic viewpoints, Thermodynamic Equilibrium, State, Property, Process, Cycle – Reversibility – Quasi–static process; Zeroth Law of Thermodynamics. Energy in state and in transition-Work and Heat. PMM I – Joule's Experiment – First law of Thermodynamics, First law applied to – process.

UNIT-II: SECOND LAW OF THERMODYNAMICS

Limitations of the First Law; Second Law of Thermodynamics- Thermal Reservoir, Heat Engine, Heat pump, Parameters of performance, Kelvin-Planck and Clausius Statements and their Equivalence / Corollaries, PMM II, Carnot cycle and its specialties, Clausius inequality, introduction to entropy.

UNIT-III: HEAT TRANSFER

Heat Transfer – Different Modes, governing laws and application to heat transfer: Fourier, Newton, Stefan–Boltzmann laws; general heat conduction equation: Cartesian co-ordinates (derivation), Steady state one-dimensional heat conduction through slabs, hollow cylinders and spheres (numericals); Concept of thermal resistance in series and parallel (composite systems), overall heat transfer coefficient; Critical radius of insulation: concept, derivation and numerical: with and without internal heat generation.

UNIT-IV: INTRODUCTION TO COOLING OF ELECTRONIC EQUIPMENT

Needs & Goals; Temperature effects on different failure modes; Electronic equipment for airplanes, missiles, satellites and spacecraft; electronic equipment for ships & submarines; electronic equipment for communication systems and ground support system; chassis and circuit boards cooling.

Learning Resources:
1. P.K. Nag, "Engineering Thermodynamics", Tata Mc Graw Hill, 4th Edition, 2008.
2. YunusCengel& Boles, "Thermodynamics – An Engineering Approach", TMH New Delhi, 2008.
3. Sachadeva R.C., "Fundamentals of Engineering Heat and Mass Transfer", New Age International (P) Ltd Publishers, New Delhi, 2010.
4. Dave S. Steinberg, "Cooling Techniques for Electronic Equipment", Second Edition, John Wiley & Sons, 1991.
5. YunusCengel& Afshin J Ghajar, "Heat and Mass Transfer: Fundamentals & its Applications", Mc Graw Hill, 5th Edition, 2013.

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	:	2	Max. Marks for each Assignment	: 5
3.	No. of Quizzes	:	2	Max. Marks for each Quiz Test	: 5

Duration of Internal Test: 90 minutes
VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

IBRAHIMBAGH, HYDERABAD – 500 031
OBJECT ORIENTED PROGRAMMING USING JAVA
(Open Elective-I) (Common for CIVIL, ECE, EEE & MECH)
SYLLABUS FOR B.E. III SEMESTER

L:T:P (Hrs/week):2:0:0	SEE Marks: 60	Course Code: **U20OE310IT**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
Explain the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, building simple GUI applications.	1. Understand fundamental concepts in Object oriented approach. 2. Develop object-oriented programs using the concepts of exception handling and multi threading. 3. Demonstrate the usage of Java I/O streams to handle user input and output. 4. Design and develop GUI programs.

UNIT- I
Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables-scope and lifetime, Operators, Control statements, Structure of a Java class, Classes, Methods, Inheritance, and Command Line Arguments.
Arrays: One-dimensional arrays, creating an array, declaration of arrays, initialization of arrays, two-dimensional arrays.
Packages: Creation, importing a package and user defined package.
Interfaces: Defining interfaces, extending interfaces, implementing interfaces.

UNIT- II
Exception Handling: Introduction, types of exceptions, syntax of exception handling code, multiple catch statements, using finally statement, user-defined exceptions.

UNIT- III
Basic I/O Streams: Java I/O classes and interfaces, Files, Stream and Byte classes, Character Streams.
Exploring java.lang: Object, Wrapper classes, String, StringBuffer, System

UNIT- IV
Introducing Awt,Awt Controls:
Event Handling: The Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces.
 Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, CheckboxGroup, Choice Controls, Using Lists, Managing Scroll Bars, Using TextField, Using TextArea, Understanding Layout Managers, Menu bars and Menus, Dialog Boxes, FileDialog, Exploring the controls, Menus ,and Layout Managers.

Learning Resources:

1. Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill, 2006.
2. James M Slack, Programming and Problem solving with JAVA, Thomson Learning, 2002.
3. C Thomas Wu, An Introduction to Object Oriented Programming with Java 5th edition, McGraw Hill Publishing, 2010.
4. Y. Daniel Liang , An Introduction to JAVA Programming, Tata McGraw Hill, 2009.
5. Kathy Sierra, Head First Java, 2/e, Shroff Publishers, 2012.
6. https://docs.oracle.com/javase/tutorial/

7. https://nptel.ac.in/courses/106105191/

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 INFORMATION TECHNOLOGY
INTRODUCTION TO SCRIPTING LANGUAGES
(Open Elective-I) (Common for CIVIL, ECE, EEE & MECH)

SYLLABUS FOR B.E. III SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks: 60	Course Code :**U200E320IT**
Credits : 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
This course will enable the students to acquire basic skills for writing python scripts.	1. Demonstrate basic knowledge of Python script. 2. Demonstrate an understanding of fundamental Python syntax and semantics and be fluent in the use of Python control flow statements and functions. 3. Construct python data structure programs using list, tuples, dictionaries, sets and numpy arrays. 4. Develop programs using Object oriented paradigm, and handle file related operations.

Unit – I
Introduction to Python, running a python script, writing comments, using variables, operators, expressions, strings and text, format specifiers, printing information. passing command line arguments, prompting users, parameters, unpacking variables.

Unit – II
Decision making: if and else if, repetition: while loops and for loops.
Defining functions, passing arguments to functions, returning values from functions, recursion.

Unit – III
Data structures: lists, operations on list, tuples, operations on tuples, sets, operations on sets, dictionaries, operations on dictionaries.
Numpy arrays: creation, access, slicing, matrix operations.

Unit – IV
Modules, Classes and Objects, is – a relationship: inheritance, has-a relationship: composition, Exception handling, File handling: reading and writing files, serialization using JSON.
Intro to Python Standard Library & other useful libraries: Scipy, Scikit, Pandas, Seaborn.

Learning Resources

1. Allen B. Downey, Think Python, 2nd Edition, Green Tea Press
2. "Learning Python", 5th Edition, O'reilly
3. https://www.python.org
4. https://nptel.ac.in/courses/106106182/
5. The Python Standard Library — Python 3.9.6 documentation
6. Python Tutorial (w3schools.com)
7. Best Python Libraries for Every Python Developer | by Claire D. Costa | Towards Data Science
8. Search results · PyPI

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, Hyderbad-500031

DEPARTMENT OF MATHEMATICS
LINEAR ALGEBRA (Open Elective)

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U20OE310MA**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	On completion of the course, students will be able to
1. **Study** the concept of Vector Spaces, Subspaces, Linear Span, Linear Dependence and Independence of vectors. 2. **Understand** the meaning of Basis and Dimension of a vector Space and Co-ordinates. 3. **Understand** the meaning of Linear transformation, properties. 4. **Understand** Range and Kernel, Rank-Nullity and Matrix of Linear Transformation. 5. **Understand** Inner Product Spaces, Orthonormal sets, Gram-Schmidt's Orothogonalization process.	1. **Solve the** problems on Vector Spaces and Linear Dependence and Independence of vectors. 2. **Determine** the Basis and Dimension of a Vector Space and find the Co-ordinates. 3. **Determine** Linear Transformation, Range and Kernel and Matrix of Linear Transformation. 4. **Determine** Range and Kernel, Rank-Nullity and Matrix of Linear Transformation. 5. **Determine** distance, orthogonal, orthonormal sets and construct orthonormal basis based on Gram-Schmidt's Orothogonalization process.

UNIT – I (8 classes)
Vector Spaces-Definition of a Vector Space, Subspaces, Basis and Dimension, Coordinates and Change of Basis.

UNIT – II (6 classes)
Linear Transformation -I

Definition of Linear Transformation- Properties of Linear Transformations – Product of Linear Transformations – Algebra of Linear Operators.

UNIT – III(6 classes)
Linear Transformation -II

Range and kernel of a linear map – Dimension of Range and Kernel - Rank and   nullity – Inverse of linear transformation - Rank nullity theorem(without Proof)- Matrix of Linear Transformation**.**

UNIT – IV(8 classes)
Inner Product Spaces-The Dot Product on R and Inner Product Spaces, Orthonormal Bases, Orthogonal Complements, Application: Least Squares Approximation.

Learning Resources

1. Introduction to linear algebra with applications, Jim DeFranza, Daniel Gagliardi, Tata McGraw-Hill
2. An introduction to Linear Algebra, V.P Mainra, J.L Arora, Affiliated to East-West Press Pvt Ltd

Reference Books:

1. Elementary Linear algebra, Anton and Rorres, Wiley India Edition

2. Advanced Engineering Mathematics, Erwin Kreysing, Wiley Publication
3. Elementary Linear algebra, ron Larson, Cengage Learning

Online Resources:

1. **http://tutorial.math.lamar.edu/Classes/DE/DE.aspx**
2. **http://mathworld.wolfram.com/topics**
3. **http://www.nptel.ac.in/course.php**

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	:	2	Max. Marks for each Assignment	:	5
3.	No. of Quizzes	:	2	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
Ibrahimbagh, Hyderbad-500031

DEPARTMENT OF CHEMISTRY
BATTERY SCIENCE AND TECHNOLOGY (OPEN ELECTIVE)
SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U20OE310CH**
Credits: 2	CIE Marks: 40	Duration of SEE :1.5 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are	On completion of the course, students will be able to
1. To introduce the various terms to understand the efficiency of batteries. 2. To know the relevant materials required for the construction of primary and secondary batteries. 3. To familiarize with the reactions involved during charging and discharging processes. 4.To focus on the need of fuel cells and the concept of their construction and functioning. 5. To emphasize on the merits and demerits of each type of battery.	1. Discuss the construction, electrochemistry, technology and applications of selected primary batteries. 2. Discuss the construction, electrochemistry, technology and applications of few secondary batteries. 3. Explain the working principle, electrochemistry, technology and applications of prominent fuel cells. 4. Evaluate different batteries or fuel cells in order to select a suitable battery or fuel cell for a given application

UNIT-I: BATTERIES- FUNDAMENTALS
Introduction and types of batteries: Primary and secondary.
Battery characteristics: Free energy change, electromotive force of battery, ampere-hour, capacity, power, power density, energy density, efficiency, cycle life, tolerance to service conditions, performance characteristics.

UNIT-II: PRIMARY BATTERIES
Construction, chemistry and technology of Zinc-Air Battery, Zinc –HgO battery and their applications.
Primary lithium batteries: Soluble cathode cells, solid cathode cells- Lithium manganese dioxide, solid electrolyte cells- Lithium polymer electrolyte battery- Applications. Reserve battery- Electrochemistry of perchloric acid cell- applications.

UNIT-III: SECONDARY BATTERIES
Construction, chemistry and technology of maintenance free lead acid battery (MFLA), valve regulated lead acid battery (VRLA), absorbed glass mat lead acid battery (AGMLA) - comparision between lead acid battery and VRLA along with advantages - Construction, electro chemistry and applications of Nickel-Cadmium battery, Nickel metalhydride battery.
Lithium ion batteries: Construction, chemistry and applications of liquid organic electrolyte cells, polymer electrolyte cells, lithium ion cells.

UNIT- IV: FUEL CELLS
Introduction, classification based on temperature and nature of electrolyte. Working principle, components, applications and environmental aspects of alkaline fuel cell (AFC)- Hydrogen-Oxygen alkaline fuel cell, Molten carbonate fuel cell (MCFC), Polymer electrolyte membrane fuel cell (PEMFC), Solid oxide fuel cell (SOFC).

Books:
1. P.C.Jain and Monica Jain, "Engineering Chemistry", DhanpatRai and Pub, Co., New Delhi (2002)
2. S.S. Dara "A text book of engineering chemistry" S.Chand and Co.Ltd., New Delhi (2006).
3. Dell R. M. and Rand D. A. J., "Understanding Batteries", Royal Society of Chemistry, UK, 2001.
4. Chemistry of Engineering Meterials by R.P Mani and K.N.Mishra, CENGAGE learning
5. ShasiChawla, "Text Book of Engineering Chemistry", DhanpatRai Publishing Company, NewDelhi,2008.
6. BalasubramanianVishwanathan, "Energy sources", Elsevier Publications.

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	:	2	Max. Marks for each Assignment	: 5
3.	No. of Quizzes	:	2	Max. Marks for each Quiz Test	: 5

Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
Ibrahimbagh, Hyderbad-500031

DEPARTMENT OF PHYSICS
SMART MATERIALS & APPLICATIONS (OPEN ELECTIVE)
SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U20OE310PH**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The Students will be able to:	On completion of the course, students will be able to
1. grasp the concepts of peizo and ferro electric materials 2. Learn fundamentals of pyro and thermo electric materials 3. gain knowledge on shape memory alloys 4. acquire fundamental knowledge on chromic materials	1. summarize various properties and applications of peizo and ferro electric materials 2. apply fundamental principles of pyro and thermo electricity in relevant fields of engineering 3. acquaint with various types of shape memory alloys and their properties and applications 4. appreciate the importance of chromic materials inengineering field.

UNIT I: PIEZO AND FERRO MATERIALS

Piezo electric effect and inverse piezoelectric effect, Piezo electric materials, Structure of Quartz crystal, Piezoelectric oscillator, Magnetostriction, Magnetostriction oscillator, piezo-electric sensors, applications of Piezo-electric materials.
Characteristics and properties of ferro-electric materials, Structure of Barium Titanate, Curie-Weiss law, applications of Ferro electric materials

UNIT II: PYRO AND THERMO-ELECTRIC MATERIALS

Pyroelectricity: pyro electric effect, pyro electric materials, pyro-electric sensors.
Thermoelectricity: thermoelectric effect, Seebeck effect, Peltier effect, thermoelectric sensor, Properties and applications of thermoelectric materials, thermoelectric generator and Thermoelectric cooler.

UNIT III: SHAPE MEMORY MATERIALS

Introduction to shape memory alloys (SMA)- Shape Memory Effect (SME) different phases of Shape memory alloys, Austenite, Martensite, Properties and characteristics of engineering SMAs**,** Super elasticity, one and two way shape memory effects, Properties of Ni-Ti shape memory alloy, Cu-based shape memory alloys, biomedical Materials, Advantages, disadvantages of SMAs, Applications of SMAs.

UNIT-IV: CHROMIC MATERIALS

Electro-chromaticity, Electro-chromic materials, Electro-chromic sensors and devices.
Photo-chromaticity, Photo-chromic materials, Photo-chromic sensors and devices.
Thermo-chromaticity, thermo-chromic materials, thermo-chromic sensors and devices.
Smart fluids: Magneto-rheological and Electro-rheological fluids.

Learning Resources:

1. K. Otsuka and C M Wayman, Shape memory materials, Cambridge university press, 1998.
2. TW Duerig, KN Melton, D Stockel, CM Wayman, Engineering aspects of shape memory alloys, Butterworth-Heinemann, 1990
3. A.K. Sawhney, A Course in Electronic Measurements and Instrumentation, Dhanpat Rai & Sons, 2015
4. D. Patranabis, Sensors and Transducers, PHI Learning Pvt. Ltd., 2013

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	:	2	Max. Marks for each Assignment	: 5
3.	No. of Quizzes	:	2	Max. Marks for each Quiz Test	: 5

Duration of Internal Test: 90 minutes

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
OPEN ELECTIVE B.E. III-Semester
Course Name: LEARNING TO LEARN
Common to all Branches

L:T: P (Hrs/Week):2	SEE Marks: 60	Course Code: U20OE310EH
Credits: 2	CIE Marks: 40	Duration of SEE:Hours:03

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to :-	At the end of this course, the student will be able to:
1. Develop effective study skills, and enable students to cut down on the number of hours spent studying	1. Get learners maximize their learning in a stipulated amount of time
2. Explore illusions of competence in learning, the challenges of overlearning, and the advantages of interleaving	2. Become competent learners and learn creatively
3. Handle procrastination and learn for long term	3. Meet deadlines, submit progress reports and recall what has been learnt for effective usage
4. Plan, prioritise and carry out tasks based on goals and priority	4. Set Performance Standards and take initiative based on set goals

OVERVIEW:
No matter what your skill levels in topics you would like to master, you can change your thinking and change your life. If you are struggling to cope, you'll see a structured treasure trove of practical techniques that walk you through what you need to do to get on track. If you've ever wanted to become better at anything, this course will help serve as your guide.

UNIT 1: STUDY SKILLS
5 hrs.
Good study skills can increase a student's confidence, competence, and self-esteem. They can also reduce anxiety about tests and deadlines. This module is designed to develop effective study skills, and enable students to cut down on the number of hours spent studying, leaving more time for other important things in their life
• Study Skills Checklist
• Learning Styles
• Habits of Effective Students
• Using the Focused and Diffuse Modes
• Introduction to memory and Memory Technique

UNIT 2: Chunking
6 hrs.

In this module, we're going to be talking about chunks. Chunks are compact packages of information that your mind can easily access. We'll talk about how you can form chunks, how you can use them to improve your understanding and creativity with the material, and how chunks can help you to do better on tests. We'll also explore illusions of competence in learning, the challenges of overlearning, and the advantages of interleaving.

• Knowledge Chunking
• Skill and Will
• Sleep and Learning

UNIT 3: Procrastination and Memory
6 hrs.

In this module, we talk about two intimately connected ideas—procrastination and memory. Building solid chunks in long term memory--chunks that are easily accessible by your short term memory—takes time. This is why learning to handle procrastination is so important. Finally, we talk about some of the best ways to access your brain's most powerful long term memory systems so that learning is long term and the learner has the ability to recall and use it as per need.

• Controlling Procrastination
• Ranking the importance of tasks with a to- do list
• Finding their most productive time
• Keeping track of time spent on different tasks
• Introduction to Deep learning

UNIT 4: Renaissance Learning and Unlocking Your Potential
7 hrs.

In this module we're going to talk more about important ideas and techniques that will enhance student's ability to learn. Students will also discover how to more profitably interact with fellow learners, how to recognize your own strengths, and how to avoid the "imposter syndrome." Fighter pilots and surgeons use checklists to help them with their critical duties—you can use a similar checklist to help you prepare for tests. Ultimately, you will learn more about the joys of living a life filled with learning!

• Psychology of Goal Setting
• Criteria for Goal Setting
• Steps in Goal Setting
• Visioning
• Strategy & Action Plan
• Goal Progress Review

METHODOLOGY	ASSESSMENTS
- Case Studies assignments	- Online
- Demonstration Group	- Individual and
- Presentations Tracking Journal	-
- Expert lectures	-

Checklist
- Writing and Audio-visual lessons
- Games & Activities
- Learning Tool

LEARNING RESOURCES
learn.talentsprint.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	:	2	Max. Marks for each Assignment	:	5
3.	No. of Quizzes	:	2	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION (R-20)
B.E. – (CIVIL ENGINEERING) IV-SEMESTER ACADEMIC YEAR 2021 - 2022
(Students Admitted in 2020-21)

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.E (Civil) IV Semester								
THEORY								
U20BS410MA	Numerical Methods, Probability and Statistics	3	-	-	3	60	40	3
U20BS430MA	Skill Development Course-III (Aptitude-II)	1	-	-	2	40	30	1
U20PC410CE	Strength of Materials – II	2	-	-	3	60	40	2
U20PC420CE	Concrete Technology	2	-	-	3	60	40	2
U20PC430CE	Fluid Mechanics	3	-	-	3	60	40	3
U20PC440CE	Building Materials and Construction	2	-	-	3	60	40	2
U20PE410CE	Skill Development Course-IV (Technical Skills-I, Data Structures Lab)	1	-	-	2	40	30	1
U20OEXXXXX	Open Elective-II	3	-	-	3	60	40	3
U20MC010CE	Environmental Science	2	-	-	3	60	40	-
PRACTICALS								
U20PC411CE	Strength of Materials Lab	-	-	2	3	50	30	1
U20PC421CE	Surveying-II Lab	-	-	2	3	50	30	1
U20PC431CE	Fluid Mechanics Lab	-	-	2	3	50	30	1
Student should complete one online certificate course equivalent to 2 credits during III-VII Semester								
TOTAL		**19**	**-**	**6**		**630**	**410**	**20**
GRAND TOTAL		**25**				**1040**		
Note: The left over hours are to be allotted to CCA-II / Sports / Library / Mentor Interaction / based on the requirement .								

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

DEPARTMENT OF MATHEMATICS
NUMERICAL METHODS, PROBABILITY & STATISTICS
(Common to Civil, EEE & Mechanical Engineering)

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week):2 : 0 : 0	SEE Marks:60	Course Code: U20PC410MA
Credits: 2	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	**At the end of the course students will be able to:**
1. Study the methods to solve algebraic and transcendental equations, apply numerical methods to interpolate.	1. Solve algebraic and transcendental equations using Bisection method Regula-Falsi, Newton-Rap son and apply numerical methods to interpolate.
2. Understand numerical differentiation and integrate functions and to solve differential equations using numerical methods.	2. Solve problems using numerical differentiation using interpolation approach and differential equations using numerical methods.
3. Understand Random variables Probability Distributions.	3. Apply various probability distributions to solve practical problems.
4. Understand tests of hypothesis for large and small samples.	4. Estimate unknown parameters of populations and apply the tests of hypotheses for large and small samples.
5. Study the method to fit different curves to a given data, how Correlation between variables can be measured.	5. Solve problems to fit various curves to the given data using curve fitting, and also to find co-efficient of correlation and to determine regression lines and their applications.

UNIT –I : Interpolation: Finite Differences- Interpolation- Newton's Forward and Backward Interpolation Formulae – Interpolation with unequal intervals – Lagrange's Interpolation Formula – Divided differences – Newton's Divided difference formula.

UNIT –II : Numerical Solutions of ODE: Numerical Differentiation -Interpolation

approach- Numerical Solutions of Ordinary Differential Equations of first order - Taylor's Series Method - Euler's Method - Runge-Kutta Method of 4th order(without proofs)

UNIT-III : Probability: Random Variables - Discrete and Continuous Random variables- Properties- Distribution functions and densities - Expectation – Variance – Normal Distribution.

UNIT-IV: Test of Hypothesis: Introduction -Testing of Hypothesis- Null and Alternative Hypothesis -Errors- -Level of Significance – Confidence Intervals-Tests of Significance for small samples - t-test for single mean - F- test for comparison of variances - Chi-square test for goodness of fit – Introduction to Design of experiments.

UNIT-V : Curve Fitting: Curve fitting by the Method of Least Squares - Fitting of Straight line- Regression - Lines of Regression Correlation – Karl Pearson's Co-efficient of Correlation.

Learning Resources:

1. R.K. Jain & S.R.K. Iyengar, Advanced Engineering Mathematics, Third Edition, Narosa Publications, 2007.

2. Higher Engineering Mathematics, Dr.B.S Grewal 40th Edition, Khanna Publishers.

3. Probability, Statistics and Random Processes, T. Veerarajan , Tata MCGraw Hill Education Private Ltd.

4. Advanced Engineering Mathematics, Kreyszig E, 8 th Edition, John Wiley & Sons Ltd, 2006.

5. A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.

6. Fundamentals of Mathematical Statistics, Gupta & Kapoor, Sultan chand & sons, New Delhi.

7. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
8. http://mathworld.wolfram.com/topics
9. http://www.nptel.ac.in/course.php

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, HYDERBAD-500031

DEPARTMENT OF MATHEMATICS
SKILL DEVELOPMENT COURSE-III (APTITUDE-II)

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week):1 : 0 : 0	SEE Marks:40	Course Code: U20BS430MA
Credits: 1	CIE Marks:30	Duration of SEE: 2 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
APTITUDE	APTITUDE
1. Build further on aptitude skills and enhance employability skills	1. Solve questions in the mentioned areas using shortcuts and smart methods
2. Enhance higher order thinking skills and problem solving in the following areas - Arithmetic ability, Numerical ability and General reasoning	2. Understand the fundamentals concept of Aptitude skills
3. Train to work systematically with speed and accuracy while problem solving	3. Perform calculations with speed and accuracy

UNIT 1: QUANTITATIVE APTITUDE- ARITHMETIC ABILITY ADVANCED
• Time speed and distance
• Boats and Streams
• Problems on trains

UNIT 2: REASONING ABILITY- LOGICAL REASONING
• Seating Arrangements- Linear; Circular; Complex
• Venn diagrams
• Syllogism
• Cubes & Cuboids
• Dices

UNIT 3: REASONING ABILITY- NON VERBAL REASONING
• Figure Series
• Directions
• Clocks
• Calendars

UNIT 4: QUANTITATIVE APTITUDE -
- Mensuration Part -1
- Mensuration Part -2
- Logarithms

UNIT 5: QUANTITATIVE APTITUDE
- Permutations and combinations
- Probability

METHODOLOGY	ASSESSMENTS
- Demonstration	- Online assignments
- Presentations	- Individual and
Group	
- Expert lectures	
- Audio-visual lessons	

Learning Resources:
learn.talentsprint.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	:	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
STRENGTH OF MATERIALS – II

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week):2: 0 : 2	SEE Marks:60	Course Code: U20PC410CE
Credits: 2	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will be able to	Upon the completion of this course students will be able to
1. Examine and interpret the deflection of simply supported, cantilever and overhanging beams 2. Analyze propped cantilevers, fixed and continuous beams for deflection, shear and bending moment 3. Locate shear centre and draw shear flow in simple sections. 4. Analyze torsion of circular shafts and analyse helical and bending springs and examine the concept of strain energy 5. Investigate the behaviour of columns and struts.	1. Express understanding of methods of double integration, conjugate beam and Mohr's theorems to solve problems of deflection of beams and construct shear force and bending moment diagrams 2. Determine shear centre for simple sections. 3. Compute the torsional shear stress across the cross section of circular shafts. 4. Compute stresses in helical springs and compute strain energy in bars subjected to axial and flexural deformation 5. Compute the axial and bending stresses in columns using various formulae

UNIT-I:**Deflections:** Slope and deflection by the double integration method for cantilever and simply supported beams, and beams with overhangs carrying point loads, uniformly distributed and varying load over entire span. Moment area and conjugate beam methods for single beams having different moment of inertia

UNIT-II: Propped Cantilevers: Cantilever beams on elastic and rigid props for point loads and uniformly distributed loads. Bending moment and shear force diagrams, and deflections.

Fixed Beams: Determination of shear force, bending moment, slope and deflection in fixed beams with and without sinking of supports for point loads, uniformly distributed loads, and uniformly varying load over entire span. SFD, BMD - Elastic curve.

UNIT-III: Continuous Beams: Determination of moments in continuous beams with and without sinking of supports by the theorem of three-moments; bending moment and shear force diagrams. Elastic curve.

Shear Centre: Concept and importance of shear centre shear flow and determination of shear centre of simple sections such as T sections and Channel sections with one axis of symmetry.

UNIT-IV: Torsion: Theory of torsion in solid and hollow circular shafts; shear stress, angle of twist, strength and stiffness of shafts. Transmission of power. Combined torsion and bending with and without end thrust. Determination of principal stresses and maximum shear stress. Equivalent Bending Moment and Twisting Moment.

Springs: Close and open coiled helical springs under axial load and axial twist.

UNIT-V: Strain Energy: Strain energy of resilience in determinate bars subjected to gradually applied loads and impact loads. Resilience of beams. Castigliano's theorem and its applications to beams. Theorem of reciprocal deflections.

Columns and struts: Euler's theory. Rankine – Gordan's formula, straight-line formula, effect of end conditions, slenderness ratio, eccentrically loaded columns, and Secant and Perry's formulae.

Learning Resources:

1. Ramamrutham S., Narayanan R., "Strength of Materials", Dhanpat Rai Publishing Company, New Delhi, 2011.
2. Bansal R.K., A text book of "Strength of Materials", Laxmi Publications, New Delhi, 2010.
3. Rajput R.K., "Strength of Materials" S.Chand Publications, New Delhi, 2006.
4. Junnarkar S.B., "Mechanics of Structures" (Vol-I & II), Charotar Publishing House, Anand, 2002.
5. Pytel and Singer F.L., "Strength of Materials", Harper & Row, New York, 1999.
6. Subramanian R., "Strength of Materials", Oxford University Press, 2010.
7. Ferdinand P. Beer, E. Russell Johnston Jr, John T. Dewolf, David F.Mazurek, "Mechanics of Materials", 2016.
8. NPTEL Course (www.nptel.ac.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
CONCRETE TECHNOLOGY

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week):2 : 0 :0	SEE Marks:60	Course Code: U20PC420CE
Credits: 2	CIE Marks:40	Duration of SEE: 3 Hrs

Course objectives	Course Outcomes
Objectives of this course are to	Upon completion of this course the students will be expected to:
1. Learn the properties of concrete in its fresh state and hardened state. 2. Design the concrete mixes using admixtures by different methods. 3. Learn the properties and applications of different types of special concretes.	1. 1.Understand the properties of concrete in its fresh state 2. Understand the properties of concrete in its hardened state 3. Design the concrete mixes by I.S. and ACI methods. 4. Use chemical and mineral admixtures in making concrete of desired properties. 5. Identify different types of special concretes for specific use.

UNIT-I:**Constituents of Concrete:** Types of cements and their composition. Tests on various properties of aggregates.
Properties of fresh concrete: Mixing and batching. Workability, factors effecting workability, various tests procedures. Segregation and bleeding. Vibration of concrete. Types of vibrators and their influence on composition. Analysis of fresh concrete.

UNIT-II : **Properties of Hardened concrete:** Strength of concrete. Water cement ratio. Gel space ratio. Effective water in the mix. Short term and long term properties of concrete. Tests and procedures. Influence of various parameters on strength of concrete. Relationship between various mechanical strengths of concrete. Non destructive testing methods-codal provisions for NDT. Curing of concrete. Maturity concept. Stress-strain curves of concrete.

UNIT-III : Mix design of concrete: Basic considerations, Parameters of mix design. Factors in the choice of mix proportions and their influence. Quality control. Various methods of mix design. I.S.Code method. and ACI methods.

UNIT-IV : Admixtures used in concrete: Classification of admixtures. Chemical and mineral admixtures. Influence of various admixtures on properties of concrete. Applications. Concept of ready mixed concrete. Fly ash concrete – properties and proportion of fly ash, applications; Recycled aggregate concrete.

UNIT-V :Special Concrete: high strength concrete, High performance concrete, Light weight concrete, High density concrete. Self- compacting concrete - their specialties and applications.

Fibre Reinforced Concrete: Need for Fibre reinforced concrete (FRC), Mechanism of FRC, types of fibres, fibre shotcrete.

Learning Resources:

1. Shetty M.S., and Jain.A.K, Concrete Technology, 8th edition,S.Chand & Company, 2019.
2. Neville A.M., and Brooks.J.J., Concrete technology, 2nd edition , pearson paper back, 2019
3. Mehta P.K., and Paulo J.M.M., Concrete-Microstructure-Properties and Material, 4th edition,McGraw Hill Education, 2017.
4. Krishnaraju N., Design of Concrete Mixes, 5th edition, CBS Publishers, 2018
5. Gambhhir M.L., Concrete Technology, 5th edition, McGraw Hill Education , 2017.
6. Santhakumar , A.R.,Concrete Technology, 2nd edition, Oxford University Press, 2018.
7. IS: 456-2000, Indian standard code of practice for plain and reinforced concrete, Bureau of Indian standards
8. IS:10262-2019, Indian standard code of practice for design of concrete mixes, Bureau of Indian standards

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
FLUID MECHANICS

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week):3 : 0 : 1	SEE Marks:60	Course Code: U20PC430CE
Credits: 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	Upon the completion of this course students will be able to
1. Learn the properties of fluids 2. Apply the laws of conservation of mass, energy and momentum for fluid flow. 3. Assess the phenomenon of flow in pipes and boundary layer	1. Compute properties of fluid and discuss about fluid statics 2. Understand various aspects of Fluid kinematics 3. Formulate equations based on conservation of mass, energy and momentum. Analyse forces on nozzles and describe devices use for discharge. 4. Compute Reynolds number, formulate equations for laminar and turbulent flow through pipes and water hammer in pipes. 5. Explain growth and separation of boundary layer and evaluate drag & lift forces for various shapes of bodies in a medium

UNIT-I: **Fluid Properties:** Definition of fluid, properties of fluids, density, specific weight, specific volume, specific gravity, bulk modulus, vapour pressure, viscosity. Newton's law of viscosity and its applications. Capillarity and surface tension.
Measurement of Pressure: Piezometer and U tube Manometers. Bourdon Gauge. Absolute pressure and Gauge pressure.
Hydro Statics: Pascal law, buoyancy, metacentre and metacentric Height, Total pressure and centre of pressure on Horizontal plane and vertical plane surfaces.

UNIT-II: **Fluid Kinematics:** Classification of fluid flow; steady, unsteady, uniform, non-uniform, one, two and three-dimensional flows, Rotational and irrotational flows. Concepts of streamline, stream tube, path line and streak line. Law of mass conservation. Continuity equation from control volume and system analysis. Stream function and velocity potential function. Convective and local acceleration, flow net and its uses.

UNIT – III: Fluid Dynamics: Body forces and surface forces. Euler's equation of motion in three dimensions.

Law of Energy Conservation: Bernoulli's equation from integration of Euler's equation. Significance of the Bernoulli's equation, limitations, modifications and application to real fluid flows, venture meter and orifice meter.

Impulse Momentum Equation: Application of the impulse momentum equation to evaluate forces on nozzles and bends. Vortex flow; forced and free vortex.

Measure of Discharge in Free Surface Flows: Notches and weirs.

UNIT-IV: Flow through Pressure Conduits: Reynold's experiment and its significance. Upper and lower critical Reynold's Numbers. Critical velocity, Hydraulic gradient and Energy gradient line. Laminar flow through circular pipes. Hagen - Poiseuille equation. Characteristics of turbulent flow. Head loss in pipes. Darcy - Weisbach equation. Friction factor. Moody's diagram. Minor losses. Pipes in series and pipes in parallel. Unsteady flow in pipes: Water hammer phenomenon, pressure rise due to gradual and sudden valve closure.

UNIT-V: Boundary layer: Boundary layer growth and separation, methods to control separation, drag and lift forces, drag on airfoil and sphere, Principle of streamlining. Displacement, energy & momentum thickness streamlined body and bluff body, Magnus effect.

Learning Resources:
1. Modi P.N. and Seth S.M., Hydraulics and Fluid Mechanics including Hydraulics Machines, Standard Book House, Delhi, 2019.
2. Bansal R.K., A Textbook Of Fluid Mechanics And Hydraulic Machines, Laxmi Publications, 2018.
3. Ojha C.S.P., Berndtsson R., Chandramouli P.N., Fluid Mechanics and Machinery, Oxford University Press, 2012.
4. Rajput R.K., Fluid Mechanics and Hydraulic Machines, S. Chand & Co., 2013.
5. K SrinivasaRaju and D Nageshkumar, " Fluid Mevhanics problem solving using MATLAB" Prentice Hall of India, 2020
6. NPTEL Course (www.nptel.ac.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
BUILDING MATERIALS AND CONSTRUCTION

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week):2 : 0 : 0	SEE Marks:60	Course Code: U20PC440CE
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:
1. Expose students to the concepts of building planning and various aspects of green buildings. 2. Acquire basic knowledge on conventional building materials and emerging building materials 3. Study construction practices like scaffolding and form work, Stair cases.	1. Apply the principles of planning and bylaws for planning of building 2. Explain the characteristics of stones, bricks, timber and steel 3. Describe the properties of cement, aggregate, concrete, mortar. 4. Illustrate the application of emerging building materials and paints, varnishes and water proofing materials in buildings. 5. Review construction practices like scaffolding, form work brick bands and types & terminology of stair cases green building concepts.

UNIT-I: Building Planning : 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, IS classification of bricks.
Timber: Timber as a building material and its uses. Various types of timber. Seasoning and its importance. Preservation of wood. Plywood & Laminates and their uses.
Reinforcing steel: Composition, types and specifications of reinforcing steel

UNIT-III: Cement: Chemical composition of cement, manufacturing process. Specifications for Ordinary Portland Cement, Types of 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.
Concrete: Designation, Geopolymer concrete, workability of concrete – factors affecting, Slump test, compacting factor test.

UNIT-IV: Emerging Building Materials: Eco friendly and Sustainable building materials-Fly ash, GGBS, Bamboo. Recycled materials- Aggregates, Plastic
Miscellaneous Materials: Paints, Varnishes and Distempers-Water proofing materials, Light Weight building blocks.

UNIT- V: 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.
Green Buildings: Concept of Green buildings, Principles of green buildings, Provision of rainwater harvesting, Certification systems – Green Rating for Integrated Habitat Assessment (GRIHA) and Leadership in Energy and Environmental Design (LEED).

Learning Resources:
1. Kumara Swamy N., Kameswara Rao A., Building Planning And Drawing, Charotar, Publications, 2013.
2. Arora S.P. and Bindra S.P., A Text Book of Building Construction, Dhanpat Rai & Sons Publications, 2013.
3. Sushil Kumar, Building Construction, Standard Publishers, 2006.
4. Varghese P.C., Building Materials, PHI Learning Pvt. Ltd., Delhi, 2015.
5. National Building Code of India, 2005.
6. Advances in Building Materials and Construction, Central Building Research Institute, Roorkee, 2004.

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

VASAVICOLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH,HYDERABAD- 500 031

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
PRINCIPLES OF DATA STRUCTURES LAB
SYLLABUS FOR B.E. IV -SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks : 50	Course Code : **U20PC311CS**
Credits : **1**	CIE Marks : 30	Duration of SEE : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course student will be able to:**
Design and implement abstractions of various data structures and their practical applications.	1. Perform operations on vanous abstractions like stacks, queues, linked lists. 2. Implement problems involving trees and graphs. 3. Choose the right data structure based on the requirements of the problem.

1. Menu driven program that implements Stacks using arrays for the following operations
   a)create   b)push   c)pop   d) peek
2. Implementation of Infix to Postfix Conversion and evaluation of postfix expresstion.
3. Menu driven program that implements Queues using arrays for the following operations
   a)create   b)insert   c)delete   d) display
4. Menu driven program that implements Circular Queues for the following operations
   a)create   b)Insert   c)delete   d) display
5. Implementation of Singly Linked List,Stack using Singly Linked List, Queue using Singly Linked List.
6. Implementation of polynomial operations using Linked List.
7. Implementation of Doubly Linked List,Circular linked list.
8. Implementation of Operations on Binary Tree (Insert,Delete,Level Order, Search)
9. Implementation of Recursive and Iterative Traversals on Binary Trees.
10. Implementation of Operations on Binary Search Tree.

11. Implementation of Quick Sort.
12. Implementation of merge Sort.

Suggested Reading:

1. Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, 2/e, Universitites Press, 2008
2. Mark A Weiss, Data Structures and Algorithm Analysis In C, Second Edition (2002), Pearson
3. Richard F, Gilberg, B.A. Forouzan, "Data Structures, A Pseudocode Approach with C", Cengage, 2nd Edition
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stem 'Introduction to Algorithms' 2002.
5. Tanenbaum A. M , Langsam Y. Augenstein M. J, Data Structures using C, Second Edition (2008), Pearson
6. Data Structures through C in depth, S K Srivastava, Deepali Srivastava, BPB publications, 2nd Edition

Online Resources:

1. http://nptel.ac.in/courses/106106127/
2. http://nptel.ac.in/courses/106103069/

No. of Internal Tests: 02   Max. Marks for Internal Test: 12

Marks for day-to-day laboratory class work   18
Duration of Internal Test: 2Hours

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

DEPARTMENT OF CIVIL ENGINEERING
ENVIRONMENTAL SCIENCE
(Common to Civil, EEE & ECE)

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week): 2 : 0 : 0	SEE Marks:60	Course Code: U20MC010CE
Credits: - - -	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Describe various types of natural resources available on the earth surface. 2. Explain the concepts of an ecosystem and the biotic and abiotic components of various aquatic ecosystems. 3. Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity. 4. Explain the causes, effects and control measures of various types of environmental pollutions. 5. Describe the methods for water conservation, the causes, effects of global warming, climate change, acid rain, ozone layer depletion, population explosion.	1. Describe the various types of natural resources. 2. Differentiate between various biotic and abiotic components of ecosystem. 3. Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India. 4. Illustrate causes, effects, control measures of various types of environmental pollutions. 5. Explain the methods of water conservation, causes, effects of climate change, global warming, acid rain and ozone layer depletion, population explosion.

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, water logging salinity. Energy resources: Renewable and non-renewable energy resources. Land Resources, soil erosion and desertification.

UNIT-II: Ecosystems: Structure and function of an ecosystem, producers, consumers and decomposers, food chains, food webs, ecological pyramids, aquatic ecosystems (ponds, oceans, estuaries).

UNIT-III: Biodiversity: Genetic, species and ecosystem diversity. Values of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity.

UNIT-IV: Environmental Pollution: Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution and solid waste & e-waste management.

UNIT-V: Social Aspects and the Environment: Water conservation, Climate change, global warming, acid rain, ozone layer depletion. Environmental Impact Assesment, population explosion.

Learning Resources:
1. Deswal S. and Deswal A., A Basic Course on Environmental studies, DhanpatRai& Co Pvt. Ltd. 2016
2. Benny Joseph, Environmental Studies, Tata McGraw-Hill, 2017
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. Rajagopalan R., Environmental Studies, Second Edition, Oxford University Press, 2015

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
STRENGTH OF MATERIALS LAB

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week): 0 : 0 : 2	SEE Marks:50	Course Code: U20PC411CE
Credits: 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	*Upon the completion of this course students will be able to*
1. Determine the properties of materials under the action of various loads.	1. Determine Young's Modulus of materials of beams by conducting deflection tests. 2. Assess the properties of materials by conducting hardness test, impact test, tension test and compression test. 3. Determine modulus of rigidity of materials by conducting torsion test and tests on springs. 4. Practise working as a team member and lead a team 5. Demonstrate professional behaviour in conducting the experiments and presenting the results effectively

List of Experiments
1. Determination of Young's modulus by conducting deflection test on   Cantilever beam
2. Determination of Young's modulus by conducting deflection test on   Simply supported beam
3. Izod Impact test
4. Direct tension test on metal rods
5. Brinnell and Rockwell Hardness test
6. Compression test on brittle and ductile materials
7. Determination of modulus of rigidity by conducting tension test on a helical spring
8. Determination of modulus of rigidity by conducting compression test
9. Determination of modulus of rigidity by conducting torsion test
10. Determination of modulus of elasticity by conducting deflection test   on fixed beam
11. Determination of modulus of elasticity by conducting deflection test   on continuous beam
12. Bend test on metal rod

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 CIVIL ENGINEERING
SURVEYING-II LAB

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week): 0 : 0 : 2	SEE Marks:50	Course Code: U20PC421CE
Credits: 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	*Upon the completion of this course students will be able to*
1. Apply classroom knowledge in laboratory exercises and handling of Theodolite, GPS and Total station.	1. Determine the RL of a given point in different practical situations 2. Apply the principles of tacheometry in the field 3. Demonstrate usage of Total Station and GPS in field projects. 4. Practice working as a team member and make effective presentations. 5. Demonstrate professional behaviour in conducting the experiments and present the results effectively

LIST OF EXPERIMENTS
1. Distance between two inaccessible points using principles of trigonometric surveying (Theodolite)
2. Determine the gradient of a line connecting two points using tangential and stadia tacheometry
3. Indirect contour surveying using Tacheometry
4. Setting of simple curve by Rankin's methods
5. Setting of simple curve by offset method
6. Introduction to Total Station and Applications-The introduction includes setting up of Total Station over a station, input values: Measurement of Horizontal & Vertical distance using Total Station
7. Develop the contour map for a given area using Total Station downloading of data into the computer and plotting the map
8. Determination of area enclosed in closed traverse having minimum 5 station. Plot the measured values using a AUTOCADD
9. Setting out works using Total Station – Staking out
10. Geographic Position System (GPS), Geographical Information System (GIS) and their applications: Determination of Latitude and Longitude of any four stations and computation of the area. Check trust worthiness of the measured results.
11. Setting of simple curve by using Total Station

12. Demonstration of Digital micro optic Theodolite.

| 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 CIVIL ENGINEERING
FLUID MECHANICS LAB

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week):0 : 0 : 2	SEE Marks:50	Course Code: U20PC431CE
Credits: 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	Upon the completion of this course students will be able to
1. Provide practical knowledge in verification of principles of fluid flow 2. Impart knowledge in measuring coefficient of discharge for various devices.	1. Determine coefficient of discharge for various measuring devices such as orifice, venturimeter, mouth piece, notches , weirs and hemi- spherical vessel and Validate Bernoulli's theorem.. 2. Calculate Reynolds number and classify types of flows. 3. Estimate Darcy's friction factor for turbulent flow in pipes. 4. Practise working as a team member and lead a team 5. Demonstrate professional behaviour in conducting the experiments and presenting the results effectively

List of Experiments
1. Determination of C_d, C_v and C_c for Circular Orifice
2. Determination of C_d for Mouthpiece
3. Determination of C_d for V-notch
4. Determination of C_d for Rectangular notch
5. Determination of C_d for Venturimeter
6. Determination of C_d for Hemi-spherical vessel
7. Determination of types of flows using Reynolds Apparatus
8. Determination of Darcy's coefficient of friction.
9. Verification of Bernoulli's Theorem.
10. Determination of C_d for Orifice Meter
11. Determination of coefficient of sudden contraction (minor losses)

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

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN
B.E. IV SEMESTER (2020-21)

Dept	Title	Code	credits
Civil	Disaster Management	U20OE410CE	3
CSE	Introduction To Data Structures	U200E410CS	3
CSE	Introduction To Software Engineering	U200E420CS	3
ECE	Mathematical Programming for Engineers	U20OE410EC	3
ECE	Introduction to Communication Systems	U20OE420EC	3
IT	Introduction to Object Oriented Programming	U20OE410IT	3
IT	Introduction to Scripting Languages	U20OE420IT	3
Mech.	Optimization Methods	U20OE410ME	3
HSS	Critical Thinking	U20OE410EH	3

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENTOF CIVILENGINEERING
DISASTER MANAGEMENT (Open Elective-II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U20OE410CE**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES Objectives of this course are to:	**COURSE OUTCOMES** Upon the completion of this course the students will be expected to:
1. Know about the state of art of disaster management in world and explore the history of the disasters and comprehend how past events have helped shape the future. 2. Study the various natural and manmade disasters and apply the mitigation measures 3. Expose students to various technologies used for disaster mitigation and management.	1. Attain knowledge on various types, stages, phases in disaster with international & national policies and programmes with reference to the disaster reduction. 2. Understand various types of natural disaster, their occurrence, Effects, Mitigation and Management Systems in India 3. Understand different types of manmade disasters, their occurrence, Effects, Mitigation and Management Systems in India. 4. Explain the utility of geography information systems (GIS), Remote sensing technology in all phases of disaster mitigation and management.

UNIT-I
Introduction: Hazard, vulnerability and risk, Types of disasters, Disaster management cycle, Progress of disaster management in world, vulnerability profile of India, Disaster management act, Disaster management in India

UNIT-II
Natural Disasters – Hydro- meteorological based disasters: Tropical cyclones, floods, drought and desertification zones - Causes, Types, effects and Mitigation measures.

UNIT-III
Natural Disasters – Geographical based disasters: Earthquake, Tsunamis, Landslides and avalanches – Causes, Types, effects and Mitigation measures.

UNIT-IV
Human induced hazards: Chemical industrial hazards, major power breakdowns, traffic accidents, etc.

UNIT-V

Role of Remote Sensing and Geographical Information Systems (GIS) in Disaster Management: Introduction to remote sensing and GIS, its applications in disaster management.

Learning Resources:

1. Rajib, S and Krishna Murthy, R.R.(2012) "Disaster Management Global Challenges and Local Solutions", Universities Press, Hyderabad, 2012.
2. Navele, P & Raja, C.K. (2009), Earth and Atmospheric Disasters Management, Natural and Manmade, B.S. Publications, Hyderabad, 2009.
3. Battacharya, T. Disaster Science and Management, Tata McGraw Hill Company, New Delhi, 2012.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

Department of Computer Science & Engineering
INTRODUCTION TO DATA STRUCTURES (OPEN ELECTIVE-II)

SYLLABUS FOR B.E. IV-SEMESTER
(COMMON FOR CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U200E410CS**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES On completion of the course, students will be able to
1. Identify and use appropriate data structure for a given problem. 2. Describe the linear and nonlinear data structures.	1. Implement linear data structures 2. Develop an application using stacks and queues. 3. Choose the appropriate nonlinear data structure and perform various operations on trees. 4. Perform various operations on graphs. 5. Analyze the time and space complexities of Algorithms.

UNIT – I:
Arrays: Arrays - ADT, Polynomials, Sparse matrices,
Linked Lists: Singly Linked Lists, Circularly linked lists, Doubly Linked Lists.

UNIT – II :
Stacks: Array Representation, Linked Representation, Applications**.**
Queues: Array Representation, Linked Representation, Applications.

UNIT – III: Introduction to non linear Data Structures: Tree Definitions and Properties, Representations of Binary Trees, Operations, Binary Tree Traversal

UNIT-IV: Graphs: Graph Definitions, properties and representations, Elementary Graph operations, Minimum Cost Spanning Trees- Kruskal's Algorithm, Prim's Algorithm.

UNIT-V: Performance analysis- time complexity and space complexity, Asymptotic Notation- Big O, Omega and Theta notations

Learning Resources:
1. Horowitz E, Sahni S and Susan Anderson-Freed, Fundamentals of Data structures in C, 2nd Edition(2008), Universities Press
2. Mark A Weiss, Data Structures and Algorithm Analysis In C, Second Edition(2002), Pearson
3. Kushwaha D. S and Misra A.K, Data structures A Programming Approach with C, Second Edition(2014), PHI.,
4. Gilberg R. F and Forouzan B. A, Data structures: A Pseudocode Approach with C, Second Edition(2007), Cengage Learning

5. Tanenbaum A. M ,Langsam Y. Augenstein M. J, Data Structures using C, Second Edition (2008), Pearson.

6. Thomas H. Cormen, Charles E. Leiserson, Ronald L Rivest, Clifford Stein, Introduction to Algorithms, Third Edition(2009), MIT Press

7. YedidyahLangsam , Moshe J. Augenstein ,Aaron M. Tenenbaum, Data Structures Using C and C++ , Second Edition(2009), PHI

8. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-fall-2011/lecture-videos

9. http://nptel.ac.in/courses/106106127/

10. http://www.nptel.ac.in/courses/106102064

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

Department of Computer Science & Engineering
INTRODUCTION TO SOFTWARE ENGINEERING (OPEN ELECTIVE-II)

SYLLABUS FOR B.E. IV-SEMESTER
(COMMON FOR CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U200E420CS**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES On completion of the course, students will be able to
1. understand the concepts involved in the lifecycle of software development 2. learn the best practices to be employed for the design, and testing of a software project.	1. Explain the software development lifecycle models for software system development. 2. Learn the requirement process steps in software process model. 3. Analyze the structural design models in object oriented system. 4. Analyze the behavioral design models used in object oriented system. 5. Identify verification and validation methods in a software engineering project at various phases of SDLC.

UNIT-I:

Introduction to Software Engineering:
A generic view of Process: Software Engineering, Process Framework, CMMI, Process Patterns, Process Assessment.
Process Models: Waterfall Model, Incremental Process Models, Evolutionary Process Models, Specialized Process Models, The Unified Process.
An Agile view of Process: What is an Agile Process, Agile Process Models- SCRUM, XP.

UNIT-II: Requirements Engineering: A bridge to Design and Construction, Requirements Engineering Tasks, Initiating Requirements Engineering Process, Eliciting Requirements, Negotiating Requirements, Validating Requirements.

UNIT-III:
Object oriented Modeling& design using UML: Introduction to UML.

Structural Modeling: Classes and Advanced Classes, Relationships ,Common Mechanisms, Class Diagrams, Interfaces, Types and Roles.

UNIT-IV:

Behavioural Modelling: Interactions, Interaction diagrams, Use Cases, Use Case Diagrams, Activity diagrams, State Machines, State chart Diagrams.

Architectural Modelling: Artifacts, Artifact diagrams, Deployment diagrams.

UNIT-V:

Testing Strategies: A Strategic approach to software testing ,Strategic issues, Test strategies for Conventional software, O-O Software, Validation testing, System testing, the art of debugging.

Testing Tactics: Software testing fundamentals, Black box and White box testing, Basis path testing, Control Structure, O-O testing methods, Testing for specialized environments, architectures and Applications testing patterns.

Learning Resources:

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, 6th Edition (2005), Tata McGrawHill.
2. Grady Booch, James Rumbagu, Ivor Jacobson, The Unified Modeling Language-User guide, (Covering UML 2.0) ,2nd Edition Pearson Education, India 2007.
3. Pankaj Jalote, An Integrated Approach to Software Engineering, 3rd Edition (2005), Narosa Publishing House.

4. http://nptel.ac.in/courses/106101061/
5. http://istqbexamcertification.com/what-is-a-software-testing/
6. http://agile.csc.ncsu.edu/SEMaterials/UMLOverview.pdf

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Mathematical Programming for Engineers (OPEN ELECTIVE - II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U20OE410EC**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES On completion of the course, students will be able to
To provide fundamental knowledge of programming language for solving problems.	1. Generate arrays and matrices for numerical problems solving. 2. Represent data and solution in graphical display. 3. Write scripts and functions to easily execute series of tasks in problem solving. 4. Use arrays, matrices and functions in Engineering applications 5. Design GUI for basic mathematical applications.

UNIT - I : Introduction:
Basics of MATLAB, MATLAB windows, Advantages of MATLAB,on-line help, file types.
MATLAB Basics: Variables and Constants –Vectors and Matrices- Arrays - manipulation- Built-in MATLAB Functions. Creating and printing simple plots, Creating ,Saving and Executing a Script File, Creating and Executing a function file.
Programming Basics: Data types-Operators – Hierarchy of operations, Relational and logical operators, if-end structure, if-else-end structure, if-elseif-else-end structure, switch-case statement, for-end loop, while-end loop, break and continue commands

UNIT - II : Scripts and Functions
Script Files, Function Files, Debugging methods in MATLAB.
Graphics: Basic 2D plots: Printing labels- grid and axes box- Entering text in a box- Axis control-Style options-Multiple plots-subplots-specialized 2D plots: stem-,bar, hist, pi, stairs, loglog , semilog ,polar ,comet 3D plots: Mesh,Contour,Surf,Stem3,ezplot.

UNIT - III : Numerical Methods Using MATLAB
Numerical Differentiation, Numerical integration- Newton-Cotes integration formulae, Multi-step application of Trapezoidal rule, Simpson's 1/3 Rule for Numerical Integration. MATLAB functions for integration.
Linear Equations-Linear algebra in MATLAB, Solving a linear system, Gauss Elimination, Finding eigen values and eigen vectors, Matrix factorizations, Advanced topics.

UNIT - IV : Nonlinear Equations

System of Non-linear equations, Solving System of Equations Using MATLAB function fsolve, Interpolation-Lagrange Interpolation, Two dimensional Interpolation, Straight line fit using Least Square Method, Curve fitting using built-in functions ployval and polyfit , cubic fit using least square method. Finding roots of a polynomial -roots function, Newton-Raphson Method

UNIT - V :

Solution of Ordinary differential Equations(ODEs)-The 4th order Runge-kutta Method, ODE Solvers in MATLAB,Solving First –order equations using ODE23 and ODE45.
Structures and Graphical user interface(GUI): Advanced data Objects, How a GUI works, Creating and displaying a GUI. GUI components, Dialog Boxes.

Learning Resources:

1. Getting started with MATLAB "A quick introduction for scientist and engineers by RudraPratap, Oxford publications.
2. Advanced Guide to MATLAB-Practical Examples in Science and EnginneringbyS.N.Alam,S.Islam,S.K.Patel-I.K.International Publishing House Pvt.Ltd.
3. Stephen J. Chapman-"MATLAB Programming for Engineers"- 5th Edition- Cengage Learning-2015. Getting started with MATLAB (Version 9) The Math works.
4. An Introduction to MATLAB® Programming and Numerical Methods for Engineers 1st Edition by   Timmy Siauw Alexandre Bayen, Elsevier-18th April 2014.
5. https://nptel.ac.in/courses/103106118/2
6. https://www.udemy.com/numerical-methods/

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Introduction to Communication Systems (OPEN ELECTIVE - II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U20OE420EC**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES On completion of the course, students will be able to
1. Distinguish between Amplitude and Frequency modulation methods and their application in Communication Receivers 2. Explain why multiplexing methods are necessary in communications and compare FDM with TDM 3. Compare and contrast FSK and BPSK modulation schemes employed in digital data transmission 4. Draw the block diagrams of different types of communication systems and explain their operation	1. Identify the Radio frequency spectrum and the bands of different types of radio systems 2. Analyze the power, efficiency and transmission bandwidth of Amplitude and Frequency Modulated signals. 3. Convert the Radio frequency to Intermediate frequency and explain the operation of Super heterodyne Receiver. 4. Compare and contrast Frequency Division Multiplexing and Time Division Multiplexing used in the Communication systems 5. Detect and correct errors present in bit stream data using parity check

UNIT - I :
Introduction to Electronic Communication: Communication systems, Types of Electronic Communication, Modulation and Multiplexing, The Electromagnetic Spectrum, Bandwidth, Communication Applications, Gain and Attenuation definitions

Amplitude Modulation Fundamentals: AM concepts, Modulation Index and Percentage of Modulation, Sidebands and the Frequency Domain, AM Power

UNIT - II :
Fundamentals of Frequency Modulation: Basic principles of Frequency Modulation, Principles of Phase Modulation, Modulation Index and Sidebands, Noise – Suppression Effects of FM, Frequency Modulation verses Amplitude Modulation.

Communication Receivers: Basic Principles of Signal Reproduction, Superheterodyne Receivers, Frequency Conversion, Intermediate Frequency and Images, Noise.
UNIT - III :

Digital Communication Techniques: Digital Transmission of Data, Parallel and Serial Transmission, Data Conversion, Pulse Modulation.

Multiplexing and De-multiplexing: Multiplexing Principles, Frequency Division Multiplexing, Time Division Multiplexing, PCM Multiplexing.

UNIT - IV :
Transmission of Binary Data in Communication Systems: Digital Codes, Principles of Digital Transmission, Transmission Efficiency, Modem Concepts and Methods – FSK, BPSK, Error Detection and Correction

UNIT - V :
Different Types of Communication Systems: Microwave Concepts, Optical Principles, Optical Communication System, Satellite Communication Systems, Satellite Orbits, Cellular Telephone Systems, Bluetooth and Wi-Fi basics

Learning Resources:

1. Louis E. Frenzel, Principles of Electronic Communication Systems, 3rd Edition. Tata Mcgraw Hill.
2. Wayne Tomasi, Electronic Communications Systems, 5th Edition, Pearson Education.
3. https://nptel.ac.in/syllabus/syllabus.php?subjectId=117102059
4. https://nptel.ac.in/courses/117101051/12

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF INFORMATION TECHNOLOGY
INTRODUCTION TO OBJECT ORIENTED PROGRAMMING (Open Elective-II)
(Common for CIVIL, ECE, EEE & MECH)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U20OE410IT**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
Explain the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, building simple GUI applications.	1. Understand fundamental concepts in Object oriented approach. 2. Develop object-oriented programs using the concepts of exception handling and multi threading. 3. Demonstrate the usage of Java I/O streams to handle user input and output. 4. Design and develop GUI programs. 5. Develop Applets for web applications.

UNIT- I

Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables-scope and lifetime, Operators, Control statements, Structure of a Java class, Classes, Methods, Inheritance, and Command Line Arguments.

Arrays: One-dimensional arrays, creating an array, declaration of arrays, initialization of arrays, two-dimensional arrays.
Packages: Creation, importing a package and user defined package.
Interfaces: Defining interfaces, extending interfaces, implementing interfaces.

UNIT- II
Exception Handling: Introduction, types of exceptions, syntax of exception handling code, multiple catch statements, using finally statement, user-defined exceptions.

UNIT- III
Basic I/O Streams: Java I/O classes and interfaces, Files, Stream and Byte classes, Character Streams, Serialization.
Exploring java.lang: Object, Wrapper classes, String, StringBuffer, System

UNIT- IV
Introducing AWT working with Graphics: AWT Classes, Working with Graphics.
Event Handling: The Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces.
Awt Controls: Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, CheckboxGroup, Choice Controls, Using Lists, Managing Scroll Bars, Using TextField, Using TextArea, Understanding Layout Managers, Menu bars and Menus, Dialog Boxes, FileDialog, Exploring the controls, Menus ,and Layout Managers.

UNIT- V
Applet Programming: Introduction, how applets differ from applications, building applet code, applet life cycle, HTML-APPLET tag, passing parameters to applets.

Learning Resources:

1. Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill, 2006.
2. James M Slack, Programming and Problem solving with JAVA, Thomson Learning, 2002.
3. C Thomas Wu, An Introduction to Object Oriented Programming with Java 5th edition, McGraw Hill Publishing, 2010.
4. Y. Daniel Liang , An Introduction to JAVA Programming, Tata McGraw Hill, 2009.
5. Kathy Sierra, Head First Java, 2/e, Shroff Publishers, 2012.
6. https://docs.oracle.com/javase/tutorial/
7. https://nptel.ac.in/courses/106105191/

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF INFORMATION TECHNOLOGY
INTRODUCTION TO SCRIPTING LANGUAGES
(Open Elective-II) (Common for CIVIL, ECE, EEE & MECH)
SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U20OE420IT**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
This course will enable the students to acquire basic skills for writing python scripts.	1. Write a python script to solve a basic problem using structured programming constructs 2. Write a python script to solve a basic problem using object oriented programming constructs 3. Create and use python modules 4. Handle file related operations 5. Encode and decode strings

Unit – I
Introduction to Python, running a python script, writing comments, using variables, operators, strings and text, format specifiers , printing information. passing command line arguments, prompting users, parameters, unpacking variables.

Unit – II
Decision making : if and else if, repetition : while loops and for loops, lists, operations on list , tuples, operations on tuples, sets, operations on sets, dictionaries, operations on dictionaries.

Unit – III
Defining functions, passing arguments to functions , returning values from functions, Exception handling.

Unit – IV
Modules , Classes and Objects, is – a relationship : inheritance, has-a relationship : composition.

Unit – V

File handling, serialization using JSON and pickle, encoding and decoding.

Learning Resources

1. Allen B. Downey, Think Python, 2nd Edition, Green Tea Press
2. "Learning Python", 5th Edition, O'reilly
3. https://www.python.org
4. https://nptel.ac.in/courses/106106182/

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MECHANICAL ENGINEERING
OPTIMIZATION METHODS (Open Elective-II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U20OE410ME**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	COURSE OUTCOMES On completion of the course, students will be able to
understand Linear & non-linear programming, transportation modeling , CPM & PERT for project scheduling and control, and application of various optimization techniques for respective field engineering (Inter disciplinary)	1. Optimization of resources in multi disciplinary areas through linear programming under different conditions. 2. Sensitivity analysis of a linear programming problem as per customer requirements to suit various Organizations. 3. Minimization of total cost to apply for transportation techniques for the transhipment of Goods and products and Implement techniques like project management to analyze about material management. 4. Optimization of resources in multi disciplinary areas through non-linear

UNIT-I
Optimization-An overview
Meaning of Optimization-Origin of Optimization-Introduction to Linear programming problems (LPP) -Formulation of LPP- Graphical method, simplex method.

UNIT-II
Advanced topics in Linear programming
Duality in LPP, Differences between primal and dual, shadow prices, Dual simplex method, sensitivity analysis. special cases in LPP.

UNIT-III
Transportation Model
Definition of the transportation model-matrix of Transportation model-Formulation and solution of transportation models- Methods for calculating Initial basic feasible solution-Optimization of transportation model using MODI method.

Project Scheduling

Introduction to network analysis, Rules to draw network diagram, Fulkerson rule for numbering events, Critical path method, PERT.

UNIT-IV
Non linear programming problems

Optimization methods for single variable, multivariable functions, Maxima-Minima

One Dimensional Minimization: Uni-modal Function, Unrestricted search, Exhaustive search,Dichtomous search, Interval Halving method, Fibonacci and golden bisection Method , Newton and Quasi Newton method.

UNIT-V
Non Linear - Unconstrained optimization: classification, scaling of design variables, Random search methods, Univeriate search, pattern Directions, Hook Jeeves, Powel method, Rosenbrock method.

Learning Resources:

1. SingiresuS.Rao, "Engineering optimization- Theory and Practice", 4thEdition, John Wiley and Sons, 2009.
2. NVS Raju, "Optimization methods for Engineers ", PHI Learning Pvt. Ltd., 2014.
3. Prem Kumar Gupta and Dr. DS Hira, "Operations Research ", S.Chand& Company Pvt. Ltd., 2014.
4. R. Paneerselvam, "Operations Research", PHI Learning Pvt Ltd., 2009.
5. Kalyanmoy Deb, Optimization for Engineering Design- algorithms and examples, PHI pvt ltd, 1st edition 2003, Delhi.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES
CRITICAL THINKING (Open Elective-II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U20OE410EH**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	COURSE OUTCOMES On completion of the course, students will be able to
To help students: • Identify the core skills associated with critical thinking. • Comprehend the various techniques of critical thinking. • **Understand where to** look for bias and assumptions in problem analysis • Understand Structure, standards, and ethics of critical thinking **Dents will learn** • How to control and evaluate their thought processes • How to reason effectively and consistently • Problem analysis best practises using their decision time most effectively	• Analyse and use techniques for comparing alternative solutions • Demonstrate the difference between deductive and inductive reasoning. • Construct a logically sound and well-reasoned argument. • Evaluate, identify, and distinguish between relevant and irrelevant information • Formulate a thesis or Hypothesis • Employing Evidence/Information Effectively

UNIT I - Components of Critical Thinking
1. Applying Reason
2. Open Mindedness
3. Analysis
4. Logic

UNIT II - Non-Linear Thinking
1. Step Out of Your Comfort Zone
2. Don't Jump to Conclusions
3. Expect and Initiate Change
4. Being Ready to Adapt

UNIT III - Logical Thinking
1. Ask the Right Questions
2. Organize the Data
3. Evaluate the Information
4. Draw Conclusions

UNIT IV - Evaluate Information
1. Making Assumptions
2. Watch out for Bias
3. Ask Clarifying Questions
4. SWOT Analysis

UNIT-V - Problem Solving
1. Identify Inconsistencies
2. Trust Your Instincts
3. Asking Why?

METHODOLOGY:-   **ASSESSMENT :-**
Case Studies   Online assignments
Demonstration   Individual and Group Presentations
Expert lectures
Writing and Audio-visual lessons

Learning Resources:-
1. Critical Thinking: A Beginner`s Guide to Critical Thinking, Better Decision Making, and Problem Solving-Jennifer Wilson
2. Wait, What? And Life`s Other Essential Questions – James E.Ryan
3. Think Smarter: Critical Thinking to Improve problem-solving and Decision Making skill - Michael Kallet
4. The Art of Thinking Clearly-Rolf Dobelli

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION (R-20)
B.E. – (CIVIL ENGINEERING) IV-SEMESTER (BRIDGE COURSE)
ACADEMIC YEAR 2021 - 2022
(LATERAL ENTRY STUDENTS ADMITTED IN 2021-22)

Course Code	Name of the Course	Scheme of Instruction Hours per Week			Scheme of Examination			Credits
		L	T	P/D	Duration in Hrs	SEE	CIE	
						Maximum Marks		
THEORY								
UB20HS410EH	English Language and Communication	2	-	-	3	50	-	-
UB20BS400MA	Matrix Theory and Vector Calculus	2	-	-	3	50	-	-
LAB								
UB20HS411EH	English Language and Communication Skills Lab	-	-	2	3	50	-	-

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

ENGLISH LANGUAGE COMMUNICATION
Bridge Course for Lateral Entry Students

2020-2021 Batch – IV Semester

L: T: P (Hrs/Week) : 2	SEE Marks: 50	Course Code: UB20HS410EH
Credits: ---	CIE Marks: - - -	Duration of SEE: Hours :3

COURSE OBJECTIVES	COURSE OUTCOMES
The Course will enable the Learners to:	**At the end of the course the students will be able to :**
1. Converse effectively in various context.	1. Use language verbally and nonverbally in appropriate contexts
2. Listen for general and specific comprehension and write paragraphs.	2. Listen for global comprehension and to infer meaning from spoken discourses. Write paragraphs coherently.
3. Understand the elements of a good paragraph	3. Write paragraphs coherently.
4. Speak appropriately in daily conversations	4. Use phrases, essential vocabulary and polite expressions in every day conversations.

UNIT-1 1.0: Communication & Functional English
1.1   Role and Importance of Communication, Process of Communication, Non- verbal communication, barriers to Communication.
Conversational phrases: greetings, introductions, apology, compliments, agreeing and disagreeing, polite forms in everyday conversations.

UNIT 2 2.0: Listening
2.1   Importance of listening, Active listening

Unit 3. 3.0: Writing
1.1   Paragraph writing, coherence and cohesion.
Unit 4 4.0: Grammar and Vocabulary
4.1   Common Errors, one word substitutes, Phrasal-verbs, collocations.

Unit-5 5.0:   Reading
5.1   **Prose text-** On shaking hands

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

Suggested Reading

1. E.Sureshkumar, P. Sreehari and J. Savithri - Essential English
2. Reading comprehension - Nuttal.J.C - Orient Blackswan
3. SunithaMishra,C. Murali Krishna, Communication Skills for Engineers, Pearson, 2004.
4. M. Ashraf Rizvi. Effective Technical Communication. Tata Mcgraw Hill, 2005.
5. Allen and Waters., How English Works.
6. Willis Jane., English through English.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MATHEMATICS

MATRIX THEORY & VECTOR CALCULUS
BRIDGE COURSE B.E. IV-SEMESTER (CBCS)
(For CIVIL & MECH)

Instruction:	2 hours/Week	SEE Marks	: 50	Subject Reference Code	UB20BS400MA
Credits:	-	CIE Marks	: -	Duration of SEE	3 Hrs

UNIT-I: DIFFERENTIATION & INTEGRATION
Differentiation of standard functions(Formulae) - Partial Derivatives – Derivative of Composite functions and Implicit functions - Chain Rule - Total Derivative
Integration - Elementary Integration – Integration of standard functions- Methods of Integration- Integration by substitution- Integration by parts.

UNIT – II : VECTOR DIFFERENTIATION
Scalar and Vector point functions -Vector Differentiation-Level Surfaces-Gradient of a scalar point function- Normal to a level surface - Directional Derivative – Divergence and Curl of a Vector field - Conservative vector field.

UNIT – III : VECTOR INTEGRATION
Line, Surface and Volume integrals- Green's Theorem – Gauss Divergence theorem - Stokes's Theorem. (all theorems without proof).

UNIT- IV : MATRIX THEORY
Rank of matrix- Echelon form - -System of Linear Equations- Consistency of Homogeneous and Non-homogeneous system of equations- Eigen values and EigenVectors.

Suggested Books:
 1. B.S. Grewal, Higher Engineering Mathematics

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCE
ENGLISH LANGUAGE COMMUNICATION SKILLS LAB (ELCS)
Bridge Course for Lateral Entry Students
(Common to all branches)

2019-2020 Batch – IV Semester

L: T: P (Hrs/Week) : 2 Tuesday / Friday	SEE Marks: 50	Course Code: UB20HS411EH
Credits: ---	CIE Marks:	Duration of SEE: Hours : 3

COURSE OBJECTIVES	COURSE OUTCOMES
The Course will enable the Learners to:	**At the end of the course the students will be able to :**
1. Converse in various situations.	1. Research and sift information to make presentations.
2. Make paper and power point presentations.	2. Listen for gist and make inferences from various speeches.
3. Speak effectively using discourse markers.	3. Use connectives and make transitions effectively while speaking.

ELCS – Component - INTERACTIVE COMMUNICATION SKILLS LAB

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

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

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

4   **Presentation Skills :**Making effective presentations, using non-verbal communication , coping with stage fright , use of Audio visual aids researching on various topics.