# 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 2019–2020**
**(For the students admitted in 2018-19)**


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

## DEPARTMENT MISSION

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

## DEPARTMENT VISION

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

## ACADEMIC RULE AND REGULATIONS

### 1. Attendance and Sessional marks requirements:

| | | |
|---|---|---|
| 1 | B.E(4yrs) | Attendance: Minimum aggregate attendance required to eligible to attend semester end exams is 75% and 65% with Medical Condonation respectively. |
| | | Sessional Marks: Minimum aggregate of sessional marks required to become eligible for appearing semester end examinations is 40% |

### II. Promotion rules for B.E(4ydc) course

| S.No | Semester/Class | Conditions to be fulfilled |
|---|---|---|
| 1 | I-SEM TO II- SEM | Regular course of study of I-SEM and 40% aggregate CIE marks in I-SEM |
| 2 | II-SEM TO III SEM | Regular course of study of II SEM and |
| | | 40% aggregate CIE marks in II-SEM |
| | | Must have secured at least 50% of total credits prescribed for I and II SEMs together |
| 3 | III-SEM to IV-SEM | Regular course of study of III-SEM and |
| | | 40% aggregate CIE marks in III-SEM |
| 4 | IV-SEM to V-SEM | Regular course of study of IV SEM |
| | | 40% aggregate CIE marks in IV-SEM |
| | | Passed in all the courses of I and II SEMs |
| | | Must have secured at lest 50% of total credits prescribed for III and IV SEMs put together |
| 5 | V-SEM to VI-SEM | Regular course of study V-SEM<br>40% aggregate CIE marks in V-SEM |
| 6 | VI-SEM to VII-SEM | Regular course of study of VI SEM |
| | | 40% aggregate CIE marks in VI-SEM |
| | | Passed in all the courses of III and IV SEMs |
| | | Must have secured at least 50% of total credits prescribed for V and VI SEMs put together |
| 7 | VII-SEM to VIII-SEM | Regular course of study of VII SEM<br>40% aggregate CIE marks in VII SEM |
| 8 | Eligibility to appear VIII-SEM exams | Regular course of study of VIII SEM and 40% aggregate CIE marks in VIII-SEM |

**III. Promotion rules for B.E(3 YDC) course (Lateral Entry)**

| S No | Semester/Class | Conditions to be fulfilled |
|---|---|---|
| 1 | III-SEM to IV-SEM | Regular course of study of III-SEM and |
| | | 40% aggregate CIE marks in III-SEM |
| 2 | IV-SEM to V-SEM | Regular course of study of IV SEM |
| | | 40% aggregate CIE marks in IV-SEM |
| | | Must have secured at lest 50% of total credits prescribed for III and IV SEMs put together |
| 3 | V-SEM to VI-SEM | Regular course of study V-SEM<br>40% aggregate CIE marks in V-SEM |
| 4 | VI-SEM to VII-SEM | Regular course of study of VI SEM |
| | | 40% aggregate CIE marks in VI-SEM |
| | | Passed in all the courses of III and IV SEMs |
| | | Must have secured at least 50% of total credits prescribed for V and VI SEMs put together |
| 5 | VII-SEM to VIII-SEM | Regular course of study of VII SEM<br>40% aggregate CIE marks in VII SEM |
| 6 | Eligibility to appear VIII-SEM exams | Regular course of study of VIII SEM and<br>40% aggregate CIE marks in VIII-SEM |

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**
**SCHEME OF INSTRUCTION AND EXAMINATION (R-18)**
**B.E. – CIVIL ENGINEERING : THIRD SEMESTER (2019 - 2020)**

| Course Code | Name of the Course | Scheme of Instruction | | | Scheme of Examination | | | |
|---|---|---|---|---|---|---|---|---|
| | | Hours per Week | | | Duration in Hrs | Maximum Marks | | Credits |
| | | L | T | P/D | | SEE | CIE | |
| **THEORY** | | | | | | | | |
| U18HS330EH | Skill Development-I Communication Skills in English – I | 2 | - | - | 3 | 60 | 40 | 2 |
| U18HS010EH | Human Values and Professional Ethics-I | 1 | - | - | 2 | 40 | 30 | 1 |
| U18BS310MA | Partial Differential Equations & Transform Techniques | 3 | - | - | 3 | 60 | 40 | 3 |
| U18BS310CE | Geology | 2 | - | - | 3 | 60 | 40 | 2 |
| U18PC310CE | Strength of Materials – I | 3 | - | - | 3 | 60 | 40 | 3 |
| U18PC320CE | Surveying-I | 3 | - | - | 3 | 60 | 40 | 3 |
| U18OEXXXXX | Open Elective-I | 2 | - | - | 3 | 60 | 40 | 2 |
| U18MC310ME | Introduction to Entrepreneurship | 1 | - | - | 2 | 40 | 30 | - |
| **PRACTICALS** | | | | | | | | |
| U18BS311CE | Geology Lab | - | - | 2 | 3 | 50 | 30 | 1 |
| U18PC321CE | Surveying - I Lab | - | - | 2 | 3 | 50 | 30 | 1 |
| U18PC331CE | Computer Aided Drafting Lab | - | - | 2 | 3 | 50 | 30 | 1 |
| Student should acquire one online certificate course during III-VII Semester | | | | | | | | |
| **TOTAL** | | **17** | **-** | **6** | | **590** | **390** | **19** |
| **GRAND TOTAL** | | **23** | | | | **980** | | |
| ***Note: The left over hours are to be allotted to ECA-I / CCA-I / CC / RC / TC based on the requirement .*** | | | | | | | | |

# VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
## SCHEME OF INSTRUCTION AND EXAMINATION (R-18)
## B.E. – CIVIL ENGINEERING : THIRD SEMESTER (2019 - 2020)

| 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 | |
| Course(s) Offered to Mech. | | | | | | | | |
| THEORY | | | | | | | | |
| U18ES310CE | Mechanics of Materials | 3 | - | - | 3 | 60 | 40 | 3 |
| PRACTICALS | | | | | | | | |
| U18ES311CE | Mechanics of Materials Lab | - | - | 2 | 3 | 50 | 30 | 1 |

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

**DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES**
SKILL DEVELOPMENT-I COMMUNICATION SKILLS IN ENGLISH – I
(COMMON FOR ALL BRANCHES)

SYLLABUS FOR III SEMESTER

| | | |
|---|---|---|
| L :T:P (Hrs/Week) :2:0:0 | SEE Marks : 60 | Course Code:**U19HS330EH** |
| Credits: 2 | CIE Marks : 40 | Duration of SEE : 3 Hours |

**Course Overview:**

Be it career or relationships, the harsh truth in today's global scene is that the future of any person is affected strongly by his//her communication skill in English. The four major skills of language learning, listening, speaking, reading and writing provide the right key to success.

**Course Objective:**

The main objective of this finishing school curriculum is to involve content for all the above mentioned four skills in teaching English and to get students proficient in both receptive and productive skills.

**Overview of the delivery Methodology:**

- Every Session will have activities on all the four skills.
- To personalize the learning a variety of case studies and structured problem solving activities will be given in small groups and the trainers will facilitate peer reviews.
- Integration of continuous grading (for assignment 1 and 2), instant feedback,( peer review sheets) clear goals, rewards (certificates and appreciation kits), have been included this time for positive reinforcement.
- The Writing and Reading exercises will be given in the workbook and will carry marks
- Vocabulary exercises will also be part of every session
- The Lateral entry students will be given a self study plan for language enhancement and will be given extra reading and writing exercises

**Unit1 – Fundamentals of Communication**

Unit Overview:

The module is an introductory module that covers the **fundamentals of communication**. This module is intended to enable the students to communicate using greetings and small sentences/queries.

**Learning Outcome:**
The students should be able to:

- Respond to questions
- Engage in informal conversations.
- Speak appropriately in formal situations
- Write formal and informal emails/letters

**Competencies:**

- Greeting appropriately
- Introducing themselves, a friend
- Reading and summarising the gist of a conversation
- Responding to simple statements and questions both verbally and in writing
- Writing an email with appropriate salutation, subject lines, introduction, and purpose of mail.
- Using appropriate vocabulary for both formal and informal situations
- Stating takeaways from a session or conversations

**Sessions:**

1. Introduction to Formal and Informal Conversations
2. Informal Conversations
3. Informal Conversations - Writing
4. Formal Conversations
5. Formal Conversations - Writing

**Unit 2 - Narrations and Dialogues**

**Unit Overview:**

The Module is intended to develop level of language competence that enables them to narrate and participate in casual dialogues.

**Learning Outcome:**
The students should be able to

- Narrate a message/story/incident, both verbally and in writing.

- Describe an event/a session/ a movie/ an article/image
- Understand Vocabulary in context

**Competencies:**

- Framing proper phrases and sentences to describe in context
- Reading Stories and articles and summarising the gist
- Speaking fluently with clarity and discrimination
- Listening for main ideas and reformulating information in his/her own words
- Drawing and write appropriate conclusions post reading a passage.
- Speaking Reading and Writing descriptive sentences and paragraphs
- Using appropriate tenses, adjectives and adverbs in conversations and written tasks

**Sessions:**

1. Recalling and Paraphrasing
2. Describing Present Events
3. Describing Past Events
4. Describing Future Events
5. Describing Hypothetical events

**Unit 3 - Rational Recap**

**Unit Overview:**

The module enables the participants to organize their communication, structure their speaking and writing, explain their thoughts/ideas, and summarize the given information.

**Learning Outcome:**

The students should be able to:

- Classify content and describe in a coherent form
- Recognize and list the key points in a topic/message/article.
- Compare and contrast using appropriate structure
- Explain cause and effect
- Understand the problem and solution framework
- Use appropriate transitions in their presentations and written assignments

**Competencies:**

- Organizing the communication based on the context and audience
- Structuring the content based on the type of information.
- Explaining a technical/general topic in detail.
- Writing a detailed explanation/process
- Recapitulating

**Sessions:**

1. Introduction to Mind maps
2. Classification
3. Sequencing
4. Description and Enumeration

**Unit 4: Technical Expositions and Discussions**

**Unit Overview:**

The module enables the students to build strategies for effective interaction and help them in developing decisive awareness and personality maintaining emotional balance.

**Learning Outcome:**
The students should be able to:

- Participate in technical and forum discussions by providing factual information, possible solutions, and examples.

**Competencies:**

- Comprehending key points of a topic and note main points including supporting details.
- Construct a logical chain of arguments and decisive points.
- Writing a review about a product by providing reasons, causes, and effects

**Sessions:**

1. Compare and Contrast
2. Cause and Effect
3. Problem and Solution

**Unit 5: Drawing Conclusions**

**Unit Overview:**

This module is intended to provide necessary inputs that enable the students to draw conclusions out of a discussion and provide reports.

**Learning Outcome:**

Students should be able to:

- Provide logical conclusions to the topics under discussion.
- Prepare, present, and analyze reports.

**Competencies:**

- Reasoning skills - Coherent and logical thinking
- Reporting and Analyzing skills.
- Analyzing the points discussed.
- Connecting all points without gaps.
- Identifying clinchers.
- Communicating the decisions

**Sessions:**

1. Reasoning
2. Analyzing
3. Generalization and Prediction

Students are given workbooks prepared by Talent sprint.

**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 Minute

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

**DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES**
HUMAN VALUES AND PROFESSIONAL ETHICS-I
(COMMON TO ALL BRANCHES)

SYLLABUS FOR III SEMESTER

| | | |
|---|---|---|
| L: T: P (Hrs/Week): 1:0:0 | SEE Marks: 40 | Course Code: **U19HS010EH** |
| Credits: 1 | CIE Marks: 30 | Duration of SEE: 2 Hours |

| 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.<br>2. Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations.<br>3. Understand professionalism in harmony with self and society.<br>4. Develop ethical human conduct and professional competence.<br>5. Enrich their interactions with the world around, both professional and personal. | 1. Gain a world view of the self, the society and the profession.<br>2. Start exploring themselves in relation to others and their work –constantly evolving into better human beings and professionals.<br>3. Inculcate Human values into their profession.<br>4. Obtain a holistic vision about value-based education and professional ethics. |

## 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-2 Holistic Understanding of Professional Ethics and Human Value**

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**<br>**Quizzes**<br>**Case-studies**<br>**Observations and practice**<br>**Home and classroom assignments** | **Discussions**<br>**Skits**<br>**Short Movies/documentaries**<br>**Team tasks and individual tasks**<br>**Research based tasks**<br>**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
- AlGore, 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 | : | 1 | Max. Marks for each Assignment | : | 5 |
| 3 | No. of Quizzes | : | 1 | 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 Branches)

SYLLABUS FOR B.E.- III-SEMESTER

| | | |
|---|---|---|
| L : T : P (Hrs./week): 3:0:0 | SEE Marks :60 | Course Code : **U19BS310MA** |
| 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 **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 t**he 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 CIVIL ENGINEERING**
GEOLOGY

SYLLABUS FOR B.E. III-SEMESTER

| | | |
|---|---|---|
| L : T : P (Hrs./week):2 : 0 : 0 | SEE Marks:60 | Course Code:**U18BS310CE** |
| 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.<br>2. Describe the geological structures, processes of weathering and classification of soils.<br>3. Explain the process of ground water exploration.<br>4. Illustrate the knowledge of geological studies for dams and reservoirs.<br>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<br>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.<br>3. Assess the occurrence of ground water in various lithological formations and location of bore wells.<br>4. Evaluate the suitability of site for the dam construction.<br>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:**

1. Parbin Singh, Engineering and General Geology, S.K.Kataria & Sons, 2010.
2. Chennakesavulu N., Text Book of Engineering Geology, Macmillan India Ltd., 2009.
3. Gokhale K.V.G.K., Engineering Geology, B.S. Publishers, 2013.
4. Bell F.G., Fundamentals of Engineering Geology, Aditya Books Pvt. Ltd., 2007.
5. Krynine D.P. and Judd W. R., Principles of Engineering Geology and Geotechnics, CBS Publishers & Distributors, Indian Edition, 2005.
6. Subinoy Gangopadhyay, Engineering Geology, Oxford University Press, 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**
STRENGTH OF MATERIALS–I

SYLLABUS FOR B.E. III-SEMESTER

| | | |
|---|---|---|
| L : T : P (Hrs./week):3:0:0 | SEE Marks:60 | Course Code: **U18PC310CE** |
| 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.<br>2. Analyze simple beams subjected to various types of loading and plot shear force and bending moment diagrams and compute bending stresses.<br>3. Define and analyze shear stresses in beams and plot shear stress distribution across cross section of beams<br>4. Define and analyze problem of columns subjected to direct and bending stresses<br>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.<br>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.<br>3. Compute direct and bending stresses in columns and beams subjected to eccentric loading.<br>4. Identify and interpret the governing equation for compound stress and strains and compute the principal stress and strains<br>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 - I

SYLLABUS FOR B.E. III-SEMESTER

| | | |
|---|---|---|
| L : T : P (Hrs./week):3:0:0 | SEE Marks:60 | Course Code:**U18PC320CE** |
| 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<br>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<br>3. Acquire knowledge on use of theodolite, tacheometer and total station equipment, its adjustments, measurements, methods employed, errors and computation of data. | 1. Employ basic surveying operations and computations for measurement of distances and angles using chain/tape and compass for the given site conditions in field<br>2. Identify the instruments used, and adopt the principles and methods involved in plane table surveying for plotting topographical features in field.<br>3. Apply the principles of leveling to measure elevations of objects with respect to known points and prepare contour maps .<br>4. Interpret the principles of measurement of angles with theodolite and total station, make traverse computations and identify omitted measurements in traverse and give solutions to such problems<br>5. Determine the elevations and horizontal distances of any point on the surface of the earth using concepts of tacheometric surveying |

**UNIT-I: Introduction to Surveying:** Plane and Geodetic surveying, Principle of surveying, Classification of surveys.

**Chain Surveying:** Principles of chain survey, Accessories and instruments employed in chain survey. Chain surveying concepts including ranging

**Compass Surveying:** Use and adjustment of prismatic compass. Methods of surveying with a compass, Bearing systems and conversions, Magnetic declination, Dip, local attraction. Errors in prismatic survey.

**UNIT-II: 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, Three-point and two-point problems

**UNIT-III: Levelling:** Definitions and principles of levelling, components of various levelling instruments, Use and adjustment of leveling 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-IV: 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. Errors in theodolite survey.

**UNIT-V: Tacheometry:** Fixed and movable hair tacheometers. Principle of stadia method, distance and elevation formula for staff held vertical and normal, instrumental constants, Anallactic lens, tangential method, use of subtense bar.

**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, 2013.
3. Duggal S K, Surveying Volume 1, Fourth edition, Mc. Graw Hill Education Pvt Ltd 2013.
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 Vidyarthi Gruha Prakshan, Pune, 2014.
6. Venkatramaiah C., A Text Book of Surveying, University Press, Hyderabad, 2011.
7. 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 Mechanical Engineering**

## INTRODUCTION TO ENTREPRENEURSHIP

SYLLABUS FOR B.E.III-SEMESTER

| | | |
|---|---|---|
| L:T:P(Hrs/week):1:0:0 | SEE Marks:40 | Course Code: **U18MC310ME** |
| Credits :0 | CIE Marks:30 | Duration of SEE:02Hours |

| **COURSE OBJECTIVE** | **COURSE OUTCOMES** *On completion of the course, students will be able to* |
|---|---|
| The objective of this course is to inspire students to develop entrepreneurial mind-set, provide the information about the facilities, schemes available to start enterprise in India. | 1 demonstrate awareness about entrepreneurship and potentially be an entrepreneur.<br>2 generate and analyse the business ideas<br>3 know about the supporting organizations available to establish the business in the country<br>4 prepare a business plan report |

**UNIT-I**: **Entrepreneurship:** Entrepreneurial characteristics, Classification of Enterprises, Incorporation of Business, Forms of Business organizations, Role of Entrepreneurship in economic development, Start-ups.

**Idea Generation and Opportunity Assessment:** Ideas generation, Sources of New Ideas, Techniques for generating ideas, Opportunity Recognition, Steps in tapping opportunities.

**UNIT-II: Institutions Supporting Small Business Enterprises:** Central level Institutions: NABARD, SIDBI, NIC, KVIC, NIESBUD, SIDO, DST, EDI, FICCI, CII, ASSOCHAM etc., State Level Institutions: DICs, SFC, SIDC, Other financial assistance.

Entrepreneurial skills, design thinking, selling and communication. Project Formulation and Appraisal, Preparation of Project Report, Content; Guidelines for Report preparation, Project report and pitching

**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.
5. Peter F. Drucker, "Innovation and Entrepreneurship", Routledge Classics, 2015.
6. Eric Ries, "The Lean Startup", Currency, 1st Edition, 2011.
7. http://www.learnwise.org


**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: | 1 | Max. Marks for each Assignment: | 5 |
| 3 | No. of Quizzes: | 1 | Max. Marks for each Quiz Test: | 5 |

Duration of Internal Test: 90 Minutes

**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: **U18BS311CE** |
| 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.<br>2. Calculate the specific gravity, porosity and water absorption in rocks.<br>3. Operate electrical resistivity meter and seismic timer.<br>4. Describe the various types of maps.<br>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.<br>2. Calculate the specific gravity, porosity and water absorption in rocks, operate electrical resistivity meter and seismic timer, study of various types of maps.<br>3. Draw the sections for the geological maps pertaining to the study of folds, faults and unconformities.<br>4. Practise working as a team member and lead a team<br>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 assessment of experiments | | | 18 |

Duration of Internal Test: 2 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:**U18PC321CE** |
| 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<br>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<br>3. Practice working as a team member and lead a team<br>4. Plan a survey appropriately with the skill to understand the surroundings<br>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. Reduction of levels by Height of Instrument (HI) & Rise and fall method.
6. Profile leveling using auto level - Plotting Longitudinal section and Transverse sections
7. Contour surveying and plotting using Grid method.
8. Measurement of horizontal angle using repetition & Reiteration methods.

9. Measurement of vertical angle; Application to simple problems of height and distance using angle of elevation and depression.
10. Transverse using of theodolite - Distribution of errors using Gales traverse table.
11. Demonstration of minor surveying instruments

| | | | |
|---|---|---|---|
| No. of Internal Tests: | 01 | Max. Marks for Internal Test: | 12 |
| Marks for assessment of experiments | | | 18 |

Duration of Internal Test: 2 Hours

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

**DEPARTMENT OF CIVIL ENGINEERING**
COMPUTER AIDED DRAFTING LAB

SYLLABUS FOR B.E. III-SEMESTER

| | | |
|---|---|---|
| L : T : P (Hrs./week):0:0:2 | SEE Marks:50 | Course Code:**U18PC331CE** |
| 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.<br>2. Learn various tools and functions of the drafting software. | 1. Understand functional planning & orientation of the buildings.<br>2. Navigate the drafting software user interface.<br>3. Learn basic tools of the software.<br>4. Apply the fundamental features of drafting software in a practical situation.<br>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/Wblock 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 assessment of experiments 18

Duration of Internal Test: 2 Hours

**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:**U18MC310CE** |
| 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.<br>2. To assess the frictional forces on rigid body.<br>3. To understand the concepts of dynamics and its principles.<br>4. To explain kinetics and kinematics of particles, projectiles, curvilinear motion and centroidal motion.<br>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.<br>2. Solve problem of bodies subjected to friction.<br>3. Distinguish between statics and dynamics and differentiate between kinematics and kinetics.<br>4. Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear motion.<br>5. Know the concepts of work and energy principles subject and derive the work energy equations for translation and connected systems. |

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

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

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

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

**UNIT-V: Work Energy:** Principles of work energy and its application to translation, particle motion and connected systems.

**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)

**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: **U18ES310CE** |
| 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.<br>2. Assess the behavior of columns subjected to axial loads and compute stresses in beams due to bending.<br>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.<br>2. Draw shear force and bending moment diagrams in statically determinate beams.<br>3. Compute stresses and strains in bending, shear and principal stresses.<br>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.<br>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:**U18ES311CE** |
| 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.<br>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.<br>2. Assess the quality of materials by conducing hardness test and impact test and also learn the operation of universal testing machine (UTM).<br>3. Determining modulus of rigidity of materials by conducting torsion test and spring test.<br>4. Practise working as a team member and lead a team.<br>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 assessment of experiments | | | 18 |

Duration of Internal Test: 2 Hours

## OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. III SEMESTER (2019-20)

| Dept | Title | Code | credits |
|---|---|---|---|
| Civil | Green Buildings | U18OE310CE | 2 |
| CSE | Introduction to Python Programming | U180E310CS | 2 |
| CSE | Cyber Security | U180E320CS | 2 |
| ECE | Introduction to Signals & Systems | U18OE310EC | 2 |
| ECE | Introduction to Principles of Communication Engineering | U18OE320EC | 2 |
| ECE | Python Programming | U18OE330EC | 2 |
| EEE | Non - Conventional Energy Sources | U18OE310EE | 2 |
| IT | Fundamentals of Data Structures | U18OE310IT | 2 |
| IT | Introduction to Linux | U18OE320IT | 2 |
| Mech. | Geometric Modeling | U18OE310ME | 2 |
| Mech. | Mechanical Technology | U18OE320ME | 2 |
| Mech. | Basic Heat Transfer for Electronic Systems | U18OE330ME | 2 |
| Maths. | Basic of Cryptology | OE520MA | 2 |
| Physics | Smart Materials and Applications | U19OE310PH | 2 |
| Chemistry | Battery Science & Technology | U18OE300CH | 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:**U18OE310CE** |
| 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.<br>2. Environmental implications of natural and building materials along with green cover<br>3. Acquire knowledge on various aspects of green buildings | 1. Explain the principles of building planning, its bylaws and provide facilities for rainwater harvesting<br>2. Relate safety to Green Technology<br>3. Understand the concepts of green buildings<br>4. Understand rating systems of GRIHA and LEED |

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

**UNIT-II: Buildings 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 – Selection of site and Orientation of the building – usage of low energy materials – 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) 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**
INTRODUCTION TO 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 : **U180E310CS** |
| 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<br>3 Develop programs using strings and list<br>4 Develop programs using tuples and dictionaries<br>5 Illustrate operations on Efficient Binary Search Trees and Multiway Search Trees. |

**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**
CYBER SECURITY (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 : **U180E320CS** |
| 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<br>2 Explain the basics of fraud techniques used by a hacker<br>3 Explore the common exploitation mechanisms and inspect data sniffing over the network<br>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) (FOR OTHER BRANCHES)

SYLLABUS FOR B.E. III – SEMESTER

| | | |
|---|---|---|
| L:T:P (Hrs./week) : 2:0:0 | SEE Marks : 60 | Course Code: **U18OE310EC** |
| 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.<br>2. Determine frequency domain characteristics of continuous and discrete time signals. | *On completion of the course, students will be able to*<br>1. Analyze basic signals and systems in continuous and discrete time domain<br>2. Apply the properties of different transformation techniques to analyze continuous time domain signals and systems in frequency domain<br>3. Determine the response of an LTI system using Convolution<br>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 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 PRINCIPLES OF COMMUNICATION ENGINEERING**
(OPEN ELECTIVE) (FOR OTHER BRANCHES)

SYLLABUS FOR B.E. III – SEMESTER

| | | |
|---|---|---|
| L:T:P (Hrs./week) : 2:0:0 | SEE Marks : 60 | Course Code: **U18OE320EC** |
| Credits : 2 | CIE Marks : 40 | Duration of SEE : 3 Hours |

| COURSE OBJECTIVES | COURSE OUTCOMES |
|---|---|
| 1. Distinguish analog and digital Modulation techniques used in various Communication systems.<br>2. Explain why multiplexing methods are necessary in communications and compare FDM with TDM. | *On completion of the course, students will be able to*<br>1. Analyze the power and transmission bandwidth of Amplitude and Frequency Modulated signals.<br>2. Understand the process of reproduction of base band signal.<br>3. Analyze various pulse analog and pulse digital Modulation Techniques.<br>4. Compare and contrast various Multiplexing techniques used in Communication systems.<br>5. Detect and correct errors present in bit stream data using parity check method. |

**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, 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, 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, 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 ELECTRONICS AND COMMUNICATION ENGINEERING**

**PYTHON PROGRAMMING**
(OPEN ELECTIVE) (FOR OTHER BRANCHES)

SYLLABUS FOR B.E. III – SEMESTER

| | | |
|---|---|---|
| L:T:P (Hrs./week) : 2:0:0 | SEE Marks : 60 | Course Code: **U18OE330EC** |
| Credits : 2 | CIE Marks : 40 | Duration of SEE : 3 Hours |

| COURSE OBJECTIVES | COURSE OUTCOMES |
|---|---|
| 1. Acquire problem solving skills<br>2. Learn programming and solve problems using Python language | *On completion of the course, students will be able to*<br>1. Develop Python programs with conditionals and loops<br>2. Design programs using functions, strings and lists<br>3. Construct Python data structures programs using tuples, dictionaries<br>4. Design programs using files, OOPS concept, regular expressions<br>5. To perform transactions using database |

**UNIT-I: Basics of Python Programming:** Features of Python**,** variables and identifiers, operators and expressions.
**Decision control Statements:** Selection/Conditional branching statements, basic loop structures/iterative Statements, nested loops, break, continue, and pass Statements.
**Functions and Modules**: function definition, function call, more on defining functions, recursive functions, modules.

**UNIT-II: Data Structures**: **Strings:** Introduction, built-in string methods and functions, slice operation, String Module. Regular Expressions.
**Lists** : Introduction, nested list, cloning lists, basic list operations, list methods. Functional programming-filter(),map(),reduce() function.
**Tuples** : Introduction, basic tuple operations, tuple assignment, tuples for returning multiple values, nested tuples, tuple methods and functions.
**Set:** Introduction, Set operations.

**UNIT – III: Dictionaries:** Basic operations, sorting items, looping over dictionary, nested dictionaries, built-in dictionary functions.
**Files and Exceptions:** reading and writing files, pickling, handling exceptions. Built-in and user-defined exceptions.
**OOPS Concepts:** Introduction, classes and object, class method and self argument, the __init__()method, class variables and object variables, public and private data members, Inheritance, Operator Overloading.

**UNIT – IV:Python Database Connectivity:** Importing MySQL for Python**,** connecting with a database, Simple querying-forming a query in MySQL, Simple Insertion-forming a MySQL insertion statement.
**Case Studies:** Python Packages- Introduction to Numpy, Pandas, Scipy, Pillow, Tensorflow, Matplotlib, Bar charts, Histograms, Scatter plots, GUI programming-Tkinter.

**Learning Resources:**

1. Reema Thareja, "Python programming using problem solving approach ", Oxford university press.
2. Allen Downey, "Think Python: How to Think Like a Computer Scientist", O'Reilly publications,2nd Edition.
3. Albert Lukaszewski, "Mysql for python ", PACKT publishers
4. Mark Lutz, "Learning Python", O'Reilly Publications.
5. Stewart Venit and Elizabeth Drake, Prelude to Programming: Concepts and Design, 6th Edition (2015), Pearson India
6. Mark J Guzdial, Introduction to Computing and programming in Python, 3rd Edition (2013), Pearson India
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 Electrical & 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: **U18OE310EE** |
| 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 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, have a working knowledge on types of fuel cells.<br>2. Estimate the solar energy, Utilization of it, Principles involved in solar energy collection and conversion of it to electricity generation.<br>3. Explore the concepts involved in wind energy conversion system by studying its components, types and performance.<br>4. Illustrate ocean energy and explain the operational methods of their utilization.<br>5. Acquire the knowledge on Geothermal energy. |

**UNIT-I: Fuel cells:** Need for Non-conventional energy sources, Types of Non-Conventional energy sources

Fuel cells: Definition-Classification of fuel cells-Design and Principle of operation with special reference to $H_2$-$O_2$-Ion- 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.

**UNIT-II: Solar Energy and Biomass Energy:**

**Solar Energy :** Solar radiation and its measurements-Solar energy collectors: Flat Plate and Concentrating Collectors- solar pond -Applications of Solar energy.

**Biomass Energy**: Definition-Biomass conversion technologies: Incineration-Thermo chemical conversion- Bio- chemical conversion

**UNIT-III: Wind Energy:** Nature of wind-Basic components of Wind Energy Conversion System(WECS)-Wind energy collectors: Horizontal and vertical axis rotors- Advantages and Disadvantages of WECS - Applications of wind energy.

**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. Wave energy conversion devices
**Geothermal Energy:** Geothermal resources- Vapour dominated geothermal plant- Liquid dominated geothermal plant- Applications of Geothermal Energy.

**Learning Resources:**

1. G.D. Rai, Non-Conventional Energy Sources ,Khanna Publishers, New Delhi, 2011.
2. B H KHAN, Non-Conventional Energy Resources, McGraw Hill, 2nd Edition, 2009.
3. Ashok Desai V, Non-Conventional Energy, Wiley Eastern Ltd, 1990.
4. Mittal K.M, Non-Conventional Energy Systems, Wheeler Publishing Co. Ltd, 1997.
5. 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: | 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 Information Technology**

FUNDAMENTALS OF DATA STRUCTURES

(Open Elective-I)
SYLLABUS FOR III-SEMESTER
(Common for CIVIL, ECE, EEE & MECH)

| | | |
|---|---|---|
| L:T:P(Hrs./week): 2:0:0 | SEE Marks :60 | Course Code : **U18OE310IT** |
| 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 Explore efficient storage mechanisms for easy access, design and implementation of various data structures. | 1. Identify appropriate linear data structure to solve a problem.<br>2. Illustrate the usage of linked lists for various applications<br>3. Demonstrate the usage of non-linear data structures – graphs & trees |

**UNIT – I: Introduction to Data Structures:** Performance Analysis: Time and Space complexity.
Introduction to Data Structures: Stacks, Representation of a Stacks using Arrays ,Applications.
Queues: Representation of a Queue using array ,Applications.

**UNIT – II: Linked List:** Introduction, Singly Linked list ,Operations on a Singly linked list.

**UNIT – III: Doubly linked list:** Doubly linked list, Operations on a doubly linked list.

UNIT – IV: **Introduction to Non-Linear Data Structures:** Trees and Graphs

**Learning Resources :**

1. Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, 2/e, Universities Press, 2008

2. Mark Allen Weiss, —Data Structures and Algorithm Analysis in C, Second Edition, Pearson Education, 1996
3. Robert Kruse, C.L.Tondo, Bruce Leung, Shashi Mogalla , — Data Structures and Program Design in C, Second Edition, Pearson Education, 2007
4. Jean-Paul Tremblay, Paul G. Sorenson,'An Introduction to Data Structures with Application', TMH, 2nd Edition.
5. Richard F, Gilberg, B.A. Forouzan, "Data Structures, A Pseudocode Approach with C", Cengage, 2nd Edition
6. http://nptel.ac.in/courses/106106127/

**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

With effect from Academic Year 2019-20 (R18)

**VASAVI COLLEGE OF ENGINEERING (Autonomous)**
IBRAHIMBAGH, HYDERABAD – 500 031
**Department of Information Technology**

INTRODUCTION TO LINUX
(Open Elective – I)
SYLLABUS FOR –III SEMESTER
(Common for CIVIL, ECE, EEE & MECH)

| | | |
|---|---|---|
| L:T:P(Hrs./week): 2:0:0 | SEE Marks :60 | Course Code : **U18OE320IT** |
| Credits : 2 | CIE Marks :40 | Duration of SEE : 3 Hours |

| **COURSE OBJECTIVES** | **COURSE OUTCOMES** *On completion of the course, students will be able to* |
|---|---|
| Acquire basic skills for using Linux operating system. | 1. Install Linux operating system and use desktop environment.<br>2. Identify and use Linux utilities to create and manage simple file processing operations.<br>3. Organize directory structures with appropriate security.<br>4. Configure and use Linux shell. |

**UNIT – I:**
Introduction to Linux, Installing Linux, Running Linux from USB Drive, Understanding X Windows System and Desktop, Navigating through Linux Desktop and Managing files. Understanding Linux file system, listing files and directory attributes, Making files and directories, Listing and changing permissions and ownership.

**UNIT – II:**
Understanding the Linux Shell, Understanding aliases, Using the shell from console or terminals, using command history and tab completion, Connecting and expanding commands, Creating aliases, Making shell settings permanent, Using man pages and other documentation.

**UNIT – III:**

Introduction to Shell Scripting: Reading input from the user, logical operators, Arithmetic operators, Environment variables, Read-only variables, command line arguments, working with arrays.

**UNIT – IV:**

Decision Making: Conditional constructs, Functions: Introduction to functions, passing arguments, sharing of data, declaration of local variables, returning information from functions, running functions in the background, creating a library of functions

**Learning resources:**

1. Introduction to Linux – A Hands On Guide, MachteltGarrels.
2. Ganesh SanjivNaik, Learning Linux Shell Scripting, Packt Publishing, 2015. Open Source Community
3. https://linuxjourney.com/
4. https://nptel.ac.in/courses/117106113/

**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 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: **U18OE310ME** |
| 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 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.<br>2 formulate 2D transformations for geometric model by matrix approach.<br>3 development of various surfaces using surface modelling.<br>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: | 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

MECHANICAL TECHNOLOGY (Open Elective-I)

SYLLABUS FOR B.E.III-SEMESTER

| | | |
|---|---|---|
| L:T:P(Hrs/week):2:0:0 | SEE Marks:60 | Course Code: **U18OE320ME** |
| 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 learn the basic principles of excavating equipment, conveying equipment hoisting equipment, concrete producing equipment and pneumatic equipment. | 1 | identify the operations of various earth moving equipments for maintenance and selection with respect to their applications. |
| | 2 | justify various conveying equipment for transporting material based on working principles. |
| | 3 | Explain the working principles of various types of hoisting equipment in civil engineering applications. |
| | 4 | examine various aggregate and concrete producing equipments used in concrete production and working of pneumatic equipment. |

**UNIT-I: EXCAVATING EQUIPMENT:** General description, operation, maintenance and selection of Earth moving and Excavating Equipment: Shovels, Dragline, Clamshell, Cable excavator, Bucket wheel excavator, Tractor, Bulldozer, Scraper, Trenchers, Grader, Earth Compactors.

**UNIT-II: CONVEYING EQUIPMENT:** Belt conveyor, Screw Conveyor, Bucket Conveyor, Apron Conveyor and Aerial Ropeway.

**UNIT-III: HOISTING EQUIPMENT:** Hoist winch, Differential and Worm geared chain hoists, Fork lift trucks, Guyed and stiffly derricks, swing and non–swing mobile crane, whirler crane, Construction elevator, passenger lift and Bucket elevators.

**UNIT-IV:AGGREGATE AND CONCRETE PRODUCING EQUIPMENT:** Crushers – Jaw, Gyratory, Hammer and Roll Crushers, Screens – Stationary,

Shaking and Vibrating screens. Concrete mixers and Concrete pumps.
**Pneumatic Equipment:** Reciprocating air– compressor, construction pneumatic tools; jack hammer, paving breaker, Rock drill, concrete vibrator.

**Learning Resources:**

1. R.L. Peurifoy, "Construction Planning Equipment and Methods", 7th Edition, McGraw-Hill Publishers, 1956.
2. Mahesh Varma, "Construction Equipment and its planning and application", Metropolitan books Co, Delhi, 2004
3. Goodes Spence, "Building and Civil Engineering Plant", Crosby Lock Wood, 1995.

**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: **U18OE330ME** |
| 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 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. Yunus Cengel & 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. Yunus Cengel & 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)**
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

**DEPARTMENT OF MATHEMATICS**
(Common to all branches except for CSE)

**BASICS OF CRYPTOLOGY (OPEN ELECTIVE)**
**SYLLABUS FOR B.E. III – SEM.,(CBCS)**

| | | |
|---|---|---|
| L:T:P(Hrs/week):2:0:0 | SEE Marks:60 | Course Code: **OE520MA** |
| Credits :02 | CIE Marks:40 | Duration of SEE:03Hours |

| COURSE OBJECTIVES | COURSE OUTCOMES |
|---|---|
| *The course will enable the students to:* | *At the end of the course students will be able to:* |
| 1. **Study** fundamentals of number theory.<br>2. **Study** various methods under monoalphabetic substitution ciphers.<br>*3.* **Understand** the methods under polyalphabetic substitution ciphers and public key cryptography.<br>4. **Study** Public key Cryptography and Cryptographic protocols and algorithms. | 1. **Apply** the knowledge of Congruences for Modular exponentiation and solving Linear Congurences.<br>2. **Apply** the methods under monoalphabetic substitution ciphers to encipher and decipher.<br>3. **Apply** the methods under polyalphabetic substitution ciphers to encipher and decipher.<br>4. **Apply** the methods RSA Cryptosystem. |

**UNIT- I Number Theory:**
Divisibility- Euclidean Algorithm – GCD using Euclidean Algorithm –Introduction to Congruences -Modular Arithmetic –Fast Modular Exponentiation-Linear Congruences.

**UNIT- II Monoalphabetic Substitution Ciphers:**
Introduction to Cryptology and Basic Terminology -Monoalphabetic Substitution Ciphers-The Additive (or shift) Cipher –The Multiplicative Cipher - The Affine Cipher.

**UNIT –III Polyalphabetic Substitution Ciphers :**
Polyalphabetic Substitution Ciphers - Integer Matrices - The Hill Digraph Cipher - The Hill Trigraph Cipher - The Vigenère Square Cipher – The Playfair Cipher - The Permutation Cipher – The Exponentiation cipher
**UNIT –IV Public Key Cryptography :** Public Key Cryptography –RSA Cryptosystem- Knapsack Cipher.

Cryptographic Protocols & Applications – Diffie-Hellman Key Exchange.

**Learning Resources:**

Elementary Number Theory , Kenneth H. Rosen, Pearson India Education services Pvt.Ltd, 6th edition.

A Course in Number Theory and Cryptography by Neal Koblitz, Springer, New York.

1. https://onlinecourses.nptel.ac.in/noc16_cs21
2. www.mastermathmentor.com

**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)**
**DEPARTMENT OF PHYSICS**

SMART MATERIALS AND APPLICATIONS
Open elective Course

| | | |
|---|---|---|
| L:T:P(Hrs/week):2:0:0 | SEE Marks:60 | Course Code: **U19OE310PH** |
| Credits :02 | CIE Marks:40 | Duration of SEE:03Hours |

| Course Objectives | Course Outcomes |
|---|---|
| ***The student will be able to*** | ***At the end of the course, the student should at least be able:*** |
| 1. grasp the concepts of peizo and ferro electric materials<br>2. Learn fundamentals of pyro and thermo electric materials<br>3. gain knowledge on shape memory alloys<br>4. acquire fundamental knowledge on chromic materials | 1. summarize various properties and applications of peizo and ferro electric materials<br>2. apply fundamental principles of pyro and thermo electricity in relevant fields of engineering<br>3. acquaint with various types of shape memory alloys and their properties and applications<br>4. appreciate the importance of chromic materials in engineering field. |

**UNIT I: PIEZO AND FERRO MATERIALS (8 hours)**

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 (6 hours)**

*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 (8 hours)**

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 (6 hours)**

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. T W Duerig, K N Melton, D Stockel, C M 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 Tests | : | 30 |
| 2 | No. of Assignments | : 3 | Max. Marks for each Assignment | : | 5 |
| 3 | No. of Quizzes | : 3 | Max. Marks for each Quiz Test | : | 5 |

Duration of Internal Tests : 90 Minutes

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

**DEPARTMENT OF CHEMISTRY**
BATTERY SCIENCE & ITS APPLICATIONS (OE)

SYLLABUS FOR B.E. III SEMESTER

| | | |
|---|---|---|
| L:T:P (Hrs./week):2:0:0 | SEE Marks :60 | Course Code :**U19OE310CH** |
| 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 introduce the various terms to understand the efficiency of batteries. | 1. Discuss the construction, electrochemistry, technology and applications of selected primary batteries. |
| 2. To know the relevant materials required for the construction of primary and secondary batteries. | 2. Discuss the construction, electrochemistry, technology and applications of few secondary batteries. |
| 3. To familiarize with the reactions involved during charging and discharging processes. | 3. Explain the working principle, electrochemistry, technology and applications of prominent fuel cells. |
| 4. To focus on the need of fuel cells and the concept of their construction and functioning. | 4. Evaluate different batteries or fuel cells in order to select a suitable battery or fuel cell for a given application |
| 5. To emphasize on the merits and demerits of each type of battery. | |

**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).

**Learning Resources:**


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 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 : 90Minutes

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**
**SCHEME OF INSTRUCTION AND EXAMINATION (R-18)**
**B.E. – CIVIL ENGINEERING : FOURTH SEMESTER (2019 - 2020)**

| Course Code | Name of the Course | Scheme of Instruction | | | Scheme of Examination | | | |
|---|---|---|---|---|---|---|---|---|
| | | Hours per Week | | | Duration in Hrs | Maximum Marks | | Credits |
| | | L | T | P/D | | SEE | CIE | |
| **THEORY** | | | | | | | | |
| U18HS430EH | Skill Development-II: Communication Skills in English – II | 2 | - | - | 3 | 60 | 40 | 2 |
| U18BS410MA | Numerical Methods, Probability and Statistics | 3 | - | - | 3 | 60 | 40 | 3 |
| U18PC410CE | Strength of Materials – II | 3 | - | - | 3 | 60 | 40 | 3 |
| U18PC420CE | Surveying-II | 3 | - | - | 3 | 60 | 40 | 3 |
| U18PC430CE | Fluid Mechanics | 3 | - | - | 3 | 60 | 40 | 3 |
| U18PC440CE | Building Technology | 2 | - | - | 3 | 60 | 40 | 2 |
| U18OEXXXXX | Open Elective-II | 3 | - | - | 3 | 60 | 40 | 3 |
| U18MC010CE | Environmental Science | 2 | - | - | 3 | 60 | 40 | - |
| **PRACTICALS** | | | | | | | | |
| U18PC411CE | Strength of Materials Lab | - | - | 2 | 3 | 50 | 30 | 1 |
| U18PC421CE | Surveying-II Lab | - | - | 2 | 3 | 50 | 30 | 1 |
| U18PC431CE | Fluid Mechanics Lab | - | - | 2 | 3 | 50 | 30 | 1 |
| Student should acquire one online certificate course during III-VII Semester | | | | | | | | |
| **TOTAL** | | **21** | **-** | **6** | | **630** | **410** | **22** |
| **GRAND TOTAL** | | **27** | | | | **1040** | | |
| ***Note: The left over hours are to be allotted to ECA-II / CCA-II / CC / RC / TC based on the requirement .*** | | | | | | | | |

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

**DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES**
SKILL DEVELOPMENT-II COMMUNICATION SKILLS IN ENGLISH-II
(COMMON FOR ALL BRANCHES)

Syllabus for IV SEMESTER

| | | |
|---|---|---|
| L:T:P:(Hrs/Week):2:0:0 | SEE Marks: 60 | Course Code: **U19HS430EH** |
| Credits: 2 | CIE Marks : 40 | Duration of SEE: Hours :03 |

**Course Overview:**

Be it career or relationships, the harsh truth in today's global scene is that the future of any person is affected strongly by his//her communication skill in English. The four major skills of language learning, listening, speaking, reading and writing provide the right key to success.

**Course Objective:**

The main objective of this finishing school curriculum is to involve content for all the above mentioned four skills in teaching English and to get students proficient in both receptive and productive skills.

**Overview of the delivery Methodology:**

- Students will be given Reading/Listening exercises that they have would have to do as a prerequisite for the class room intervention
- Every Session will have activities on all the four skills. Listening, Speaking, Reading and Writing
- The Writing and Reading exercises will be given in the workbook and will carry marks
- Vocabulary exercises will also be part of every session
- Students will be asked to summarise their takeaways in every class in three sentences.
- The Lateral entry students will be given a self study plan for language enhancement and will be given extra reading and writing exercises. This will be done through Talent Sprint's online portal

- To personalize the learning a variety of case studies and structured problem solving activities will be given in small groups and the trainers will facilitate peer reviews.
- Integration of continuous grading (for assignment 1 and 2), instant feedback, (peer review sheets) clear goals, rewards (certificates and appreciation kits), have been included this time for positive reinforcement.

**Unit 1: Discussions and Debates**

**Module Overview:**

The module enables the students to build strategies for effective group interaction and help them in developing decisive awareness and personality maintaining emotional balance.

**Learning Outcome:**
The students should be able to:

- Participate in group and forum discussions by providing factual information, possible solutions, and examples.
- Debate on a topic by picking up the key points from the arguments placed.

**Competencies:**

- Analytical and Probing Skills
- Interpersonal Skills
- Comprehending key points of the debate and note decisive points including supporting details.
- Construct a logical chain of arguments and decisive points.

**Sessions:**

1. Six Thinking Hats
2. Biker B
3. Initiation Techniques
4. Generating points (VAP,SPELT,KWA)
5. Summarization Techniques

**Unit 2: Powerful Presentations**

**Unit Overview:**

Presentations need to be very straightforward and logical. This Module is designed to introduce students to an ideal structure for a presentation

**Learning Outcome:**

Students should be able to:

- Provide logical conclusions to the topics under discussion.
- Prepare, present, and analyze reports.
- Analyzing the points discussed.
- Connecting all points without gaps.
- Identifying clinchers.
- Communicating the decisions

**Sessions:**

1. Persuasion skills
2. Debating Structure and Content
3. Toulmin Model
4. Case Study Based Group Discussions

**Unit 3 - Effective Technical Writing**

**Unit Overview:**

Organizing writing in a logical order, using headings and easy-to-see bookmarks, and formatting table information are important for technical writing. This module is designed to give the trainees inputs on how to organize using Information Mapping. Editing plays an important role in Technical Writing. In this unit the trainees are also given inputs to correct spelling, language and Punctuation errors.

**Learning Outcome:**

The Students should be able to choose appropriate words and tone to present accurate, specific, and factual written documents

**Competencies:**

- Reporting an incident
- Writing/Presenting an essay
- Language and Vocabulary

**Sessions:**

1. Information Mapping
2. Report writing
3. Memos
4. SoP (statement of purpose)
5. MoM (Minutes of the Meeting)

## Unit 4 - Reading for Content and Context

### Unit Overview:

This course is designed to develop and improve reading and study skills needed for college work. Topics include identifying main idea and supporting details, determining author's purpose and tone, distinguishing between fact and opinion, identifying patterns of organization in a paragraph or passage and the transition words associated with each pattern, recognizing the relationships between sentences, identifying and using context clues to determine the meanings of words, identifying logical inferences and conclusions, and recognizing the point and support of an argument.

### Learning Outcomes

Upon completion of the course, students should be able to:

1. Compose a summary of beginning high level reading text that identifies the thesis and key supporting details.
2. Summarize with 70% comprehension.
3. Apply reading skills, including how to approach different types of literature.

### Competencies

- Distinguish facts from opinions.
- Make inferences
- Identify author's purpose, point of view, tone, and method of development.
- Comprehend the use of figurative language.
- Synthesize information gathered from reading in order to give informed opinion.

### Sessions:

1. Skimming and Scanning Techniques
2. Recognition of author's purpose
3. Awareness of stylistic differences
4. Evaluation of fact and opinion

5. Discernment of fact and opinion

## Unit 5 – Critical Reading Skills

### Unit Overview:

Research shows that good reading skills can lead to well written assignments. In this unit, students will learn reading strategies to understand and retain information, to understand the organization of reading passages, and strategies for learning and retaining vocabulary. Building on these basic strategies, students will develop skills to critically analyze texts. In addition, students will practice and develop paraphrasing and summarizing skills. Students will receive ongoing feedback on their assignments throughout the course.

### Learning Outcomes

- Recognition of propaganda techniques
- Present vocabulary building methods
- Use comprehension and vocabulary strategies to raise reading rate.

### Competencies:

The student will enhance the ability to apply the following critical thinking skills when reading:

a. Understand the meaning of new vocabulary through:

1) Context clues, e.g., synonyms, antonyms, examples, definitions, and restatements, etc.

2) Roots and affixes

b. Analyze text, e.g., simple outlining and note taking, summarize, draw conclusions, and apply information to personal experiences.

### Sessions

1. Contextual Vocabulary
2. Theme Detection
3. Note making and Inference
4. Main idea identification
5. Précis Writing
6. Critical Response

**Students are given workbooks prepared by Talent Sprint.**

**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 MATHEMATICS**

NUMERICAL METHODS, PROBABILITY & STATISTICS
(Common to Civil, EEE & Mechanical)

SYLLABUS FOR B.E. IV-SEMESTER

| | | |
|---|---|---|
| L : T : P (Hrs./week): 3:0:0 | SEE Marks :60 | Course Code : **U19BS410MA** |
| 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 | **Study t**he 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 $4^{th}$ 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. lyengar, Advanced Engineering Mathematics, Third Edition, Narosa Publications, 2007.
2. Higher Engineering Mathematics, Dr.B.S Grewal $40^{th}$ 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, HYDERABAD – 500 031

**DEPARTMENT OF CIVIL ENGINEERING**
STRENGTH OF MATERIALS – II

SYLLABUS FOR B.E. IV-SEMESTER

| | | |
|---|---|---|
| L : T : P (Hrs./week):3: 0 : 0 | SEE Marks:60 | Course Code: **U18PC410CE** |
| Credits : 3 | 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<br>2. Analyze propped cantilevers, fixed and continuous beams for deflection, shear and bending moment<br>3. Locate shear centre and draw shear flow in simple sections.<br>4. Analyze torsion of circular shafts and analyse helical and bending springs and examine the concept of strain energy<br>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<br>2. Determine shear centre for simple sections.<br>3. Compute the torsional shear stress across the cross section of circular shafts.<br>4. Compute stresses in helical springs and compute strain energy in bars subjected to axial and flexural deformation<br>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**
SURVEYING-II

SYLLABUS FOR B.E. IV-SEMESTER

| | | |
|---|---|---|
| L : T : P (Hrs./week): 3 : 0 : 0 | SEE Marks:60 | Course Code: **U18PC420CE** |
| Credits : 3 | CIE Marks:40 | Duration of SEE: 3 Hrs |

| In this subject the students will | Upon the completion of this course students will be able to |
|---|---|
| 1. Understand basic surveying operations and computations using theodolite for various applications in field such as determination of elevations and setting of various curves<br>2. Study the modern techniques in surveying with GPS, aerial photogrammetry, remote sensing, GIS. | 1. Determine the elevations and horizontal distances of any point on the surface of the earth using concepts of trigonometric leveling and geodetic observations.<br>2. Compute the parameters required for setting out simple circular curve, reverse curve, compound curves and introduce the concepts of transition curves and vertical curves required for layout of roads and railways.<br>3. Compute area of regular / irregular land from field measurements and volume of the earthwork from cross sections, spot levels and contours.<br>4. Apply the concepts of modern tools such as GPS and aerial photogrammetry for measurement of details on surface of earth and relate to civil engineering problems<br>5. Understand the concepts of Remote sensing, GIS and outline the techniques for measurement of sounding in water by various hydrographic surveying techniques |

**UNIT-I**: **Trigonometric leveling and Geodetic observations:** Trigonometrical levelling, calculation of elevations and distances of accessible and inaccessible objects, Problems. Geodetic observations, Refraction and curvature corrections, axis signal correction, determination of difference in elevation by single and reciprocal observations, problems.

**UNIT-II**: **Curves:** Theory of simple curves. Setting out simple curves by linear and angular methods. Compound curves – Elements – Solution to different cases. Reverse curves – Parallel straights and Non parallel straights. Introduction to transition curves and vertical curves.

**UNIT-III: 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, Introduction to planimeter.

**Computation of volumes:** Computation of area of cross section for level section, two level section, side hill 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

**UNIT-IV: Global Positioning System (GPS):** Overview of GPS, Functional system of GPS – Space segment, control segment and user segment, working principle of GPS/DGPS, Errors in GPS

**Introduction to photogrammetry:** Basic definitions, scale of vertical photograph, Displacements and errors in aerial photogrammetry, Introduction to UAV systems, classification and applications

**UNIT-V:Remote Sensing**: Definition, Elements of remote sensing, Electromagnetic spectrum and radiation, concept of spectral reflectance, Types of remote sensing, Remote sensing satellites, sensor resolutions, and applications to Civil Engineering.

**Geographic Information Systems (GIS):** Definition, components of GIS, Functions and advantages of GIS, applications to Civil Engineering

**Hydrographic Survey:** Brief introduction, Equipment used in hydrographic survey, methods and applications.

**Learning Resources:**

1. Punmia B.C., Ashok Kumar Jain, Arun Kumar Jain, Surveying, Vol. 1 and 2, Laxmi Publications, 2016.
2. Duggal S.K., Surveying-II, Mc Graw Hill, 2013.

3. Basudeb Bhatta, Remote Sensing and GIS, Oxford University Press, 2011.
6. Subramanian R., Surveying and Levelling, Oxford University Press, 2014.
7. Venkatramaiah C., A Text Book of Surveying, Universities Press, Hyderabad, 2011.
8. David Clark, Plane and Geodetic Surveying for Engineers, Higher Surveying Vol. 2,CBS Publishers and Distributors Pvt Ltd, 2004.
9. Arora K.R., Surveying, Vol.1 and 2, Standard Publishers Distributors, 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**
FLUID MECHANICS

SYLLABUS FOR B.E. IV-SEMESTER

| | | |
|---|---|---|
| L : T : P (Hrs./week):3 : 0 : 0 | SEE Marks:60 | Course Code:**U18PC430CE** |
| 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<br>2. Apply the laws of conservation of mass, energy and momentum for fluid flow.<br>3. Assess the phenomenon of flow in pipes and study concepts of dimensional analysis and model studies. | 1. Compute properties of fluid and discuss about fluid statics<br>2. Understand various aspects of Fluid kinematics<br>3. Formulate equations based on conservation of mass, energy and momentum. Analyse forces on nozzles and describe devices use for discharge.<br>4. Compute Reynolds number, formulate equations for laminar and turbulent flow through pipes and water hammer in pipes.<br>5. Discuss and solve problems on compressible flow and dimensional analysis and model studies. |

**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 :Dimensional Analysis and Model Studies:** Dimensional analysis as a tool in experimental hydraulics, Buckingham's pi-theorem, applications, geometric, Kinematics and dynamic similarity, similarity laws; significance of Reynold's, Froude and Mach Numbers, different types of models and their scale ratios.

**Learning Resources:**

1. Modi P.N. and Seth S.M., Hydraulics and Fluid Mechanics including Hydraulics Machines, Standard Book House, Delhi, 2015.
2. Bansal R.K., Fluid Mechanics and Hydraulic Machines, Laxmi Publications, 2010.
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. 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 TECHNOLOGY**

SYLLABUS FOR B.E. IV-SEMESTER

| | | |
|---|---|---|
| L : T : P (Hrs./week):2 : 0 : 0 | SEE Marks:60 | Course Code: **U18PC440CE** |
| 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.<br>2. Acquire basic knowledge on conventional building materials and emerging building materials<br>3. Study construction practices like scaffolding and form work, Stair cases. | 1. Apply the principles of planning and bylaws for planning of building<br>2. Explain the characteristics of stones, bricks, timber and steel<br>3. Describe the properties of cement, aggregate, concrete, mortar.<br>4. Illustrate the application of emerging building materials and paints, varnishes and water proofing materials in buildings.<br>5. Review construction practices like scaffolding, form work brick bands and types & terminology of stair cases. |

**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, 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 Building:** Concept of Green building, 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

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

**DEPARTMENT OF CIVIL ENGINEERING**
ENVIRONMENTAL SCIENCE

SYLLABUS FOR B.E. IV-SEMESTER

| | | |
|---|---|---|
| L : T : P (Hrs./week): 2 : 0 : 0 | SEE Marks:60 | Course Code:**U18MC010CE** |
| 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.<br>2. Explain the concepts of an ecosystem and the biotic and abiotic components of various aquatic ecosystems.<br>3. Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity.<br>4. Explain the causes, effects and control measures of various types of environmental pollutions.<br>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.<br>2. Differentiate between various biotic and abiotic components of ecosystem.<br>3. Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India.<br>4. Illustrate causes, effects, control measures of various types of environmental pollutions.<br>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, Dhanpat Rai & Co Pvt. Ltd. 2013.
2. Benny Joseph, Environmental Studies, Tata McGraw-Hill, 2006.
3. Suresh K. Dhameja, Environmental Studies, S.K. Kataria & Sons, 2010.
4. De A.K., Environmental Chemistry, New Age International, 2003.
5. Odum E.P., Fundamentals of Ecology, W.B. Sunders Co., USA, 2004.
6. Sharma V.K., Disaster Management, National Centre for Disaster Management, IIPE, Delhi, 2013.
7. Rajagopalan R., Environmental Studies, Second Edition, Oxford University Press, 2013.

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

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | No. of Internal Tests | : 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:**U18PC411CE** |
| 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.<br>2. Assess the properties of materials by conducting hardness test, impact test, tension test and compression test.<br>3. Determine modulus of rigidity of materials by conducting torsion test and tests on springs.<br>4. Practise working as a team member and lead a team<br>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 assessment of experiments | | | 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)<br>0 : 0 : 2 | SEE Marks:50 | Course Code:<br>**U18PC421CE** |
| 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<br>2. Apply the principles of tacheometry in the field<br>3. Demonstrate usage of Total Station and GPS in field projects.<br>4. Practice working as a team member and make effective presentations.<br>5. Demonstrate professional behaviour in conducting the experiments and present the results effectively |

**LIST OF EXPERIMENTS**

1. Determine the RL of the given point using two instrument stations by single plane and double plane method.
2. Determine the gradient of a line connecting two points using tangential and stadia tacheometry
3. Indirect contour surveying using Tacheometry
4. Plotting simple curve by Rankine's method using theodolite
5. Measurement of horizontal and vertical distances using total station
6. Plotting of a simple curve using total station
7. Plotting of topographical features of the given area using total station
8. Develop the contour map for a given area using total station
9. Traversing by using total station

10. Location of points, lines and polygon features by using GPS survey.

| | | | |
|---|---|---|---|
| No. of Internal Tests: | 01 | Max. Marks for Internal Test: | 12 |
| Marks for assessment of experiments | | | 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:**U18PC431CE** |
| 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<br>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..<br>2. Calculate Reynolds number and classify types of flows.<br>3. Estimate Darcy's friction factor for turbulent flow in pipes.<br>4. Practise working as a team member and lead a team<br>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 assessment of experiments | | | 18 |

Duration of Internal Test: 2 Hours

## OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. IV SEMESTER (2019-20)

| Dept | Title | Code | credits |
|---|---|---|---|
| Civil | Disaster Management | U18OE410CE | 3 |
| CSE | Introduction to Data Structures | U180E410CS | 3 |
| CSE | Introduction to Software Engineering | U180E420CS | 3 |
| ECE | Mathematical Programming for Engineers | U18OE410EC | 3 |
| ECE | Introduction to Communication Systems | U18OE420EC | 3 |
| EEE | Basics of Electrical Power Generation | U18OE410EE | 3 |
| IT | Introduction to Object Oriented Programming | U18OE410IT | 3 |
| IT | Introduction to Scripting Languages | U18OE420IT | 3 |
| Mech. | Optimization Methods | U18OE410ME | 3 |
| Physics | Introduction to Optoelectronic Devices | U19OE410PH | 3 |

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

**DEPARTMENT OF CIVIL ENGINEERING**
DISASTER MANAGEMENT (Open Elective-II)

SYLLABUS FOR B.E. IV-SEMESTER

| | | |
|---|---|---|
| L:T:P (Hrs./week):3:0:0 | SEE Marks:60 | Course Code: **U18OE410CE** |
| Credits : 3 | 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. 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.<br>2. Study the various natural and manmade disasters and apply the mitigation measures<br>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.<br>2. Understand various types of natural disaster, their occurrence, Effects, Mitigation and Management Systems in India<br>3. Understand different types of manmade disasters, their occurrence, Effects, Mitigation and Management Systems in India.<br>4. Explain the utility of geography information systems (GIS), Remote sensing technology in all phases of disaster mitigation and management.<br>5. Understand the Role of Remote Sensing and Geographical Information Systems (GIS) in Disaster 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 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 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 : **U180E410CS** |
| 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. | 1 | Implement linear data structures |
| 2 | Describe the linear and nonlinear 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 Leaming
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. Yedidyah Langsam , 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 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 : 1 Hour 30 Minutes

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

**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 : **U180E420CS** |
| 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 | 1 | Explain the software development lifecycle models for software system development. |
| 2 | learn the best practices to be employed for the design, and testing of a software project. | 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 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 : 1 Hour 30 Minutes

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

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**MATHEMATICAL PROGRAMMING FOR ENGINEERS**

(OPEN ELECTIVE)

SYLLABUS FOR B.E. IV – SEMESTER (for other branches)

| | | |
|---|---|---|
| L:T:P (Hrs./week) : 3:0:0 | SEE Marks : 60 | Course Code: **U18OE410EC** |
| Credits : 3 | CIE Marks : 40 | Duration of SEE : 3 Hours |

| COURSE OBJECTIVES | COURSE OUTCOMES |
|---|---|
| To provide fundamental knowledge of programming language for solving problems. | *On completion of the course, students will be able to*<br>1. Generate arrays and matrices for numerical problems solving.<br>2. Represent data and solution in graphical display.<br>3. Write scripts and functions to easily execute series of tasks in problem solving.<br>4. Use arrays, matrices and functions in Engineering applications<br>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 $4^{th}$ 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 Rudra Pratap, Oxford publications.
2. Advanced Guide to MATLAB-Practical Examples in Science and Engineering by S.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 Tests: 90 Minutes

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

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**INTRODUCTION TO COMMUNICATION SYSTEMS**
(OPEN ELECTIVE)

SYLLABUS FOR B.E. IV – SEMESTER (for other branches)

| | | |
|---|---|---|
| L:T:P (Hrs./week) : 3:0:0 | SEE Marks : 60 | Course Code: **U18OE420EC** |
| Credits : 3 | CIE Marks : 40 | Duration of SEE : 3 Hours |

| COURSE OBJECTIVES | COURSE OUTCOMES |
|---|---|
| 1. Distinguish between Amplitude and Frequency modulation methods and their application in Communication Receivers<br>2. Explain why multiplexing methods are necessary in communications and compare FDM with TDM<br>3. Compare and contrast FSK and BPSK modulation schemes employed in digital data transmission<br>4. Draw the block diagrams of different types of communication systems and explain their operation | *On completion of the course, students will be able to*<br>1. Identify the Radio frequency spectrum and the bands of different types of radio systems<br>2. Analyze the power, efficiency and transmission bandwidth of Amplitude and Frequency Modulated signals.<br>3. Convert the Radio frequency to Intermediate frequency and explain the operation of Superheterodyne Receiver.<br>4. Compare and contrast Frequency Division Multiplexing and Time Division Multiplexing used in the Communication systems<br>5. Detect and correct errors present in bit stream data using parity check<br>6. Explain the basic principles of different types of communication systems. |

**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 Tests: 90 Minutes

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

**DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING**

BASICS OF ELECTRICAL POWER GENERATION
(OPEN ELECTIVE –II)

SYLLABUS FOR B.E. IV-SEMESTER

| | | |
|---|---|---|
| L:T:P(Hrs./week):3:0:0 | SEE Marks: 60 | Course Code: **U18OE410EE** |
| 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 the knowledge about the electrical power generation from conventional energy sources and cost of the electrical power. | 1. Compare different sources of energy and types of power plants. |
| | 2. Enumerate the factors effecting choice of thermal ,hydel and nuclear power generation |
| | 3. Illustrate the advantages and disadvantages of thermal ,hydel and nuclear power generation |
| | 4. Estimate the cost of electrical energy consumed |

**Unit-I Introduction:**
Electric power generation scenario in INDIA from Conventional and non conventional sources of energy. Advantages and disadvantages with conventional and non-conventional energy sources.

**Unit-II Thermal power station:**
Schematic arrangement, selection of site, Environmental aspects for selecting the sites and locations of thermal power stations, advantages and disadvantages

**Unit-III Hydro power station:**
Schematic arrangement, choice of site selection of hydro power. Environmental aspects advantages and disadvantages

**Unit-IV Nuclear power station:**
Mechanism of Energy Release, Nuclear Reactions-Types, Methods of Nuclear Reactions, nuclear Materials, Advantages, Factors of Selecting Site, Reactor and their functions, Nuclear Reactor Classification, Working of Nuclear Power Stations

**Unit-V Tariff:**
Electrical energy calculation in units. Cost of electrical energy, load factor and demand factor, tariff method- flat rate, block rate, two part.

**Learning Resources:**

1. M.L.Soni,P.V Gupta,U.S Bhatnagar and A.Chakraborti "A text book on Power System Engineering" Dhanpat Rai & Co.Pvt.Ltd.1999.
2. V.K Mehta and Rohit Mehta "Principles of Power Systems" S.Chand & company LTD, New Delhi 2004.
3. S.N.Singh "Electrical Power Generation, Transmission and Distribution",PHI, 2003.
4. GD Rai "Non Conventional Energy Sources "Khanna Publishers, 4th edition 2000.
5. Electrical Power, Dr. S.L. Uppal.

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

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

Duration of Internal Test: 90 Minutes

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

**DEPARTMENT OF INFORMATION TECHNOLOGY**

INTRODUCTION TO OBJECT ORIENTED PROGRAMMING
(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: **U18OE410IT** |
| 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.<br>2. Develop object-oriented programs using the concepts of exception handling and multi threading.<br>3. Demonstrate the usage of Java I/O streams to handle user input and output.<br>4. Design and develop GUI programs.<br>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.

**Multithreaded Programming**: Introduction to threads, creating threads, extending the Thread class, implementing the Runnable interface, life cycle of

a thread, priority of a thread, synchronization, and Inter-thread Communication.

**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

**Exploring java.util:** Scanner, StringTokenizer, BitSet , Date, Calendar, Timer.

**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 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 INFORMATION TECHNOLOGY**

INTRODUCTION TO SCRIPTING LANGUAGES

(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 :**U18OE420IT** |
| Credits : 3 | CIE Marks: 40 | Duration of SEE : 3 Hours |

| **COURSE OBJECTIVES** | **COURSE OUTCOMES**<br>*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<br>2. Write a python script to solve a basic problem using object oriented programming constructs<br>3. Create and use python modules<br>4. Handle file related operations<br>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 Tests | : | 30 |
| 2 | No. of Assignments | : | 3 | Max. Marks for each Assignment | : | 5 |
| 3 | No. of Quizzes | : | 3 | Max. Marks for each Quiz Test | : | 5 |

Duration of Internal Tests : 90 Minutes

# VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

## Department of Mechanical Engineering

## OPTIMIZATION METHODS (Open Elective-II)

SYLLABUS FOR B.E.IV-SEMESTER

| | | |
|---|---|---|
| L:T:P(Hrs/week):3:0:0 | SEE Marks:60 | Course Code: **U18OE410ME** |
| Credits :03 | 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 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 programming under different conditions. optimization of resources in multi disciplinary areas through non-linear programming under different conditions. |

### 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. Singiresu S.Rao, “Engineering optimization- Theory and Practice”, 4th Edition, 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: | 02 | Max.Marks for each Internal Test: | 30 |
| 2 | No. of Assignments: | 03 | Max. Marks for each Assignment: | 05 |
| 3 | No. of Quizzes: | 03 | Max. Marks for each Quiz Test: | 05 |

Duration of Internal Test: 90 Minutes

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**
**DEPARTMENT OF PHYSICS**
**Open elective Course**
**INTRODUCTION TO OPTOELECTRONIC DEVICES**

| | | |
|---|---|---|
| L:T:P(Hrs/week):3:0:0 | SEE Marks:60 | Course Code: **U19OE410PH** |
| Credits :03 | CIE Marks:40 | Duration of SEE:03Hours |

| Course Objectives | Course Outcomes |
|---|---|
| *The student will be able to*<br>1. gain knowledge on working of optoelectronic light sources like LED<br>2. grasp the concepts of lasing action, merits and demerits of lasers<br>3. acquire the fundamental knowledge on photo-detectors.<br>4. Narrate the properties of chromic materials | *At the end of the course, the student should at least be able:*<br>1. accustom with various device structures of optoelectronic light sources like LED<br>2. acquaint with various types of lasers and their applications<br>3. assimilate working and use of photo detectors and solar cells in various applications<br>4. appreciate the importance of chromic materials in engineering field |

**UNIT-I: LIGHT EMITTING DIODES**

Review of semiconductors, direct and indirect band semiconductors, electron-hole pair generation and recombination process- emission radiation and band gap of semiconductor-electroluminescence-construction and working of homojunction LED- introduction to SLED and ELED-semiconductor materials for LED fabrication, and OLEDS, applications of LEDs.

**UNIT-II: SEMICONDUCTOR LASERS**

Semiconductor diode laser -construction-working principle- advantages and applications of diode lasers. Semiconductor lasers- rate equations for carrier and photon-density, and their steady state solutions, modes in resonating cavity, gain and loss, quantum efficiency, construction and working of homo-junction and hetero-junction semiconductor lasers, advantages and applications of lasers.

**UNIT-III: SOLAR CELLS**

Solar spectrum-Solar Cell- Photovoltaic effect- I-V characteristics of solar cell -

fill factor, efficiency- materials fabrication of solar cells-thin film solar cell-solar panels- applications of solar cells.

**UNIT-IV: PHOTODETECTORS**

Photodiodes: Working and construction of Photodiode and its characteristics-dark current-PIN Photodiode-Avalanche Photodiode-Photodiode Quantum Efficiency-advantages and applications of photodiodes.

**UNIT-V: CHROMIC MATERIALS (6 hours)**

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. Ben G Streetman and Sany Kumar Banerjee, Solid state electronic devices, 7th edition, Pearson, 2016
2. Jasprit Singh, Semiconductor devices: Basic principles, Wiley, Delhi, 2014
3. M.N. Avadhanulu, Kshirsagar and TVS Arun Murthy, A textbook of Engineering Physics, 11th Edition, S. Chand, 2018.

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

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

Duration of Internal Test: 90 Minutes