

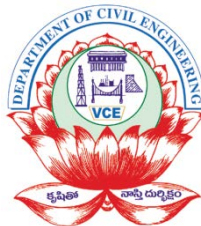
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD-31**

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 2022–2023
(For the students admitted in 2021-22)**



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

Institution Vision

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

Institution Mission

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

Department Vision

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

Department Mission

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

Program Educational Objectives (PEOs):

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

Program Outcomes (POs)

Engineering Graduates will be able to:

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

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

Program Specific Outcomes (PSOs)

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

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-21)
BE (CIVIL ENGINEERING) III-SEMESTER ACADEMIC YEAR 2022 - 2023
(Students Admitted in 2021-22)

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									
U21HS020EH	Human Values and Professional Ethics-II	1	-	-	2	40	30	1	
U21HS330EH	Skill Development Course-I (Communication Skills-I)	1	-	-	2	40	30	1	
U21HS340EH	Skill Development Course-II (Aptitude-I)	1	-	-	2	40	30	1	
U21BS310MA	Transform Techniques and Partial Differential Equations	3	-	-	3	60	40	3	
U21ES310CS	Programming for Engineers	3	-	-	3	60	40	3	
U21PC310CE	Strength of Materials – I	3	-	-	3	60	40	3	
U21PC320CE	Surveying	3	-	-	3	60	40	3	
U21PC330CE	Building Materials and Construction	2	-	-	3	60	40	2	
U21OEXXXX	Open Elective-I	2	-	-	3	60	40	2	
PRACTICALS									
U21ES311CS	Programming for Engineers Lab	-	-	2	3	50	30	1	
U21PC311CE	Surveying-I Lab	-	-	2	3	50	30	1	
U21PC321CE	Computer Aided Drafting Lab	-	-	2	3	50	30	1	
<i>Student should complete one online certificate course equivalent to 2 credits during III-VI Semester</i>									
Total		19	-	6		630	420	22	
Grand Total		25				1050			
<i>Note: The left over hours are to be allotted to ECA-I / CCA-I / Sports / Library / Mentor Interaction / based on the requirement .</i>									

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES**

HUMAN VALUES AND PROFESSIONAL ETHICS-II

(Common to all branches)

SYLLABUS FOR B.E. III-SEMESTERS

L:T:P (Hrs./week): 1:0:0	SEE Marks : 40	Course Code : U21HS010EH
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<p>The course will enable the learners to:</p> <ol style="list-style-type: none">1. Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations2. Understand professionalism in harmony with self and society.3. Develop ethical human conduct and professional competence.4. Enrich their interactions with the world around, both professional and personal.	<p>At the end of the course the learners will be able to: -</p> <ol style="list-style-type: none">1. Distinguish between Personal and Professional life goals—constantly evolving into better human beings and professionals.2. Work out the strategy to actualize a harmonious environment wherever they work.3. Distinguish between ethical and unethical practices, and start implementing ethical practices4. Apply ethics and values in their personal and professional interactions.

UNIT 1: NORMATIVE ETHICS & SOCIETAL ETHICS

This unit deals with normative ethics, the branch of moral philosophy, or ethics, concerned with criteria of what is morally right and wrong. It includes the formulation of moral rules that have direct implications for what human actions, institutions, and ways of life should be like. This unit also covers societal ethics which is the systematic reflection on the moral dimensions of social structures, systems, issues, and communities.

- 1.1 Ethical Accountability
- 1.2 Society & Ethics
- 1.3 Rights & Responsibilities

UNIT 2: PROFESSIONAL ETHICS - NEED FOR ETHICAL CODES

This unit covers the code of Professional Ethics- it is designed to ensure that

students learn the necessary skills that groom them to behave like employees should, one that is socially acceptable and respectful of one another. It establishes the rules for behavior and sends a message to every employee that universal compliance is expected.

- 2.1 Professional Ethics
- 2.2 Ethical Code
- 2.3 Flipped Classroom

UNIT 3: PRIVACY

This unit covers "Cyber ethics" - the code of responsible behaviour on the Internet. Just as we are taught to act responsibly in everyday life with lessons such as "Don't take what doesn't belong to you" and "Do not harm others," we must act responsibly in the cyber world as well. The basic rule is "Do not do something in cyberspace that you would consider wrong or illegal in everyday life."

- 3.1 Basics of Cyber Ethics
- 3.2 Privacy
- 3.3 Flipped Classroom

UNIT 4: MEDIA AND MEDICAL ETHICS

This unit covers Media and Medical ethics is the best division of applied ethics dealing with the specific ethical principles and standards of media (including broadcast media, film, theatre, the arts, print media and the internet) and medicine (practice of clinical medicine and related scientific research)

- 4.1 Media Ethics
- 4.2 Medical Ethics
- 4.3 Flipped Classroom

MODE of DELIVERY

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

- Value Education website, <Http://www.universalhumanvalues.info>
- UPTU website, <Http://www.uptu.ac.in>
- Story of stuff, <Http://www.storyofstuff.com>

- Al Gore, As Inconvenient Truth, Paramount Classics ,USA
- Charlie Chaplin, Modern Times, United Artists, USA
- IIT Delhi, Modern Technology-The Untold story-Anand Gandhi, Right Here Right Now, Cyclewala production.

Learning Resources:

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

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

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

Duration of Internal Tests : 90 Minutes

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES**

**SKILL DEVELOPMENT COURSE I -COMMUNICATION SKILLS IN ENGLISH I
(Common to all branches)
SYLLABUS FOR B.E. 2/4-III SEMESTER**

L:T:P (Hrs./week): 2:0:0	SEE Marks : 40	Course Code : U21HS320EH
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<p>The course will enable the learners to:</p> <ol style="list-style-type: none">1. Get students proficient in both receptive and productive skills especially virtual2. Enable students to understand the importance and method of exchanging information in a formal space- both written and spoken3. Introduce students to an ideal structure for a presentation and discussion- individually and in groups4. Develop and improve reading skills needed for college work and reproduce the content based on the situational need.	<p>At the end of the course the learners will be able to: -</p> <ol style="list-style-type: none">1. Introduce themselves effectively and converse in a formal environment especially in the online space2. Write emails with appropriate structure and content3. Use appropriate structure based on the content employing appropriate transitions in written and spoken communication4. Paraphrase content and write an effective summary

Unit 1: Delightful Descriptions

- 1.1 Introductions on an Online Forum
- 1.2 Making Observations and Giving Opinion
- 1.3 Recalling and Describing

Unit 2: Formal Conversation Skills

- 2.1 Ask for Information
- 2.2 Give Information
- 2.3 Give Feedback
- 2.4 Seek Permission

Unit 3: Technical Expositions and Discussions

- 3.1 Classification
- 3.2 Sequence

- 3.3 Compare and Contrast
- 3.4 Cause and Effect
- 3.5 Problem and solution

Unit 4: Rational Recap

- 4.1 Paraphrasing - Written
 - a. Summarizing - Written
 - b. Paraphrasing – Spoken
 - c. Summarizing – Spoken

**METHODOLOGY
ASSESSMENTS**

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

Learning Resources:

[learn.talentsprint.com](https://www.learn.talentsprint.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 | : | 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), HYDERABAD
DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES**

SKILL DEVELOPMENT COURSE-II APTITUDE- I

(Common to all branches)

SYLLABUS FOR B.E.2/4- III SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks : 40	Course Code : U21BS330EH
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<p>The course will enable the learners to:</p> <ol style="list-style-type: none">1. Students will be trained to enhance their employability skills.2. Students will be introduced to higher order thinking and problem solving skills in the following areas - Arithmetic Ability, Numerical Ability and General Reasoning.3. Students will be trained to work systematically with speed and accuracy while problem solving.4. Students will be trained to apply concepts like percentages and averages to solve complex problems.5. Students will be trained to use effective methods like elimination of options and shortcuts to solve problem accurately.	<p>At the end of the course the learners will be able to: -</p> <ol style="list-style-type: none">1. Solve questions in the mentioned areas using shortcuts and smart methods.2. Understand the fundamentals concept of Aptitude skills.3. Perform calculations with speed and accuracy.4. Solve complex problems using basic concepts.5. Use shortcuts with ease for effective problem solving.

UNIT 1: QUANTITATIVE APTITUDE - NUMERICAL ABILITY

- 1.1 Introduction to higher order thinking skills
- 1.2 Speed Math
- 1.3 Number systems
- 1.4 LCM & HCF

UNIT 2: QUANTITATIVE APTITUDE- ARITHMETIC ABILITY FOUNDATION

- 2.1 Ratio proportions
- 2.2 Partnership
- 2.3 Ages
- 2.4 Allegations and mixtures

2.5 Averages

UNIT 3: QUANTITATIVE APTITUDE- WORD PROBLEMS PART 1

- 3.1 Percentages
- 3.2 Profit and loss

UNIT 4: REASONING ABILITY- GENERAL REASONING PART 1

- 4.1 Blood Relations
- 4.2 Number Series
- 4.3 Coding and decoding

UNIT 5: QUANTITATIVE APTITUDE- WORD PROBLEMS PART 2

- 5.1 Time and Work
- 5.2 Chain Rule
- 5.3 Pipes and Cisterns

Prescribed textbook for theory:

1. Quantitative Aptitude S.CHAND by Dr. R S Aggarwal
2. A Modern Approach to Verbal & Non-Verbal Reasoning S.CHAND by Dr. R S Aggarwal

Suggested Reading

1. Learn.talentsprint.com/References Courses
2. Quantitative Aptitude Disha Publications
3. LOGICAL Reasoning Disha Publications

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

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

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

IBRAHIMBAGH, HYDERBAD-500031

DEPARTMENT OF MATHEMATICS

TRANSFORM TECHNIQUES & PARTIAL DIFFERENTIAL EQUATIONS

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):3 : 1 : 0	SEE Marks:60	Course Code: U21BS310MA
Credits: 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>The course will enable the students to:</i>	<i>At the end of the course students will be able to:</i>
<ol style="list-style-type: none"> 1.Understand the Definition of Laplace Transform and its Properties 2.Understand the Definition of inverse Laplace Transforms-Properties and it's applications. 3 Study the Fourier series, conditions for expansion of function and half range series 4 Formulate and understand linear and nonlinear partial differential equations. 5 Study the applications of Partial Differential equations 	<ol style="list-style-type: none"> 1.Evaluate Laplace transforms of functions. Apply Laplace transforms to evaluate integrals 2. Evaluate Inverse Laplace transforms of functions. Apply transforms to solve ordinary differential equations arising in engineering problems. 3 Expand any function which is continuous, Discontinuous, even or odd in terms of its Fourier series. 4 Formulate the Partial differential equations by eliminating arbitrary constants and functions and solve linear, non linear Partial differential equations. 5 Solve the one dimensional wave(Vibrations of a string), heat equations and two dimensional heat equations.

UNIT-I : Laplace Transforms: Introduction to Laplace transforms - Sufficient Condition for Existence of Laplace Transform –Properties of Laplace Transform-First shifting- Second shifting-Change of scale- Multiplication with t^n - Division by t – Laplace Transform of Derivatives - Laplace Transform of Integrals Evaluation of Integrals by Laplace Transforms.

UNIT-II: Inverse Laplace Transforms: Introduction to Inverse Laplace transforms - Properties of Inverse Laplace Transform-First shifting- Second shifting-Change of scale- Multiplication with s^n - Division by s – Method of partial fractions - Convolution Theorem (without proof)- Application of Laplace transforms to higher order linear differential equation with Constant Coefficient

UNIT –III : 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 –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 (steady state condition).

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.

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 : 90 Minutes

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
PROGRAMMING FOR ENGINEERS
(Common to Mech. & Civil)

SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : U21ES310CS
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSEOBJECTIVES	COURSEOUTCOMES
	On completion of the course, students will be able to
<ol style="list-style-type: none">1. Acquire problem solving skills.2. Develop flow charts.3. Understand structured programming concepts.4. Write programs in C Language.	<ol style="list-style-type: none">1. Design flowcharts and algorithms for solving a given problem using the fundamentals of programming.2. Apply decision making, looping constructs and functions to develop programs for a given problem.3. Store data using arrays and perform searching and sorting operations on the data.4. Design programs on string handling and operations on arrays using dynamic memory management techniques.5. Develop programs to store data and perform operations using structures and files.

UNIT-I: Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Flow charts. Number Systems (Binary, Octal, Decimal and Hexadecimal)

Introduction to C Language: Background, C Programs, Identifiers, Data types, Variables, Constants, Input / Output, Expressions, Precedence and Associativity, Evaluating Expressions, Type Conversion, Statements, Operators.

UNIT-II: Selection: simple if, if-else, else if ladder, nested if and switch – case.

Repetition: Introduction to Loops, while, for, do-while Statements, Loop Examples, break, continue, go to.

Functions: Designing Structured Programs, Functions Basics, User Defined Functions, Inter-Function Communication, Standard Functions, Scope, Storage Classes-Auto, Register, Static, Extern, Scope Rules. Recursive Functions

UNIT-III: Arrays: Concepts, One-Dimensional Arrays in C, Array Applications: Linear Search and Binary Search, Selection Sort and Bubble Sort. Two-Dimensional Arrays, Applications: matrix operations

UNIT-IV: Pointers: Introduction, Pointers for Inter-Function Communication, Pointer Arithmetic. Introduction to dynamic memory allocation

Character handling functions: input, output character handling functions, built in character handling functions

Strings: Introduction to strings, Input and Output operations using scanf (), printf(), gets(), puts().String library functions: strlen(), strcpy(), strcat(), strcmp(), strlwr(),strupr(), strrev()); basic programs using string library functions, Array of strings.

UNIT-V: Structure: Definition and Initialization of Structures, Accessing Structures, Arrays of Structures, Structures and Functions, Unions.

Files: Introduction to files, file operations, reading data from files, writing data to files. Basic programs using files.

Pre-processor Directives: Types of pre-processor directives, examples.

Learning Resources:

1. Forouzan B.A & Richard F. Gilberg, A Structured Programming Approach using C, 3rd Edition (2013), Cengage Learning.
2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition(2006),Prentice-Hall.
3. Rajaraman V, The Fundamentals of Computer, 4th Edition(2006), Prentice-Hall of India
4. Steve Oualline, Practical C Programming, 3rd Edition (2006), O'Reilly Press.
5. Jeri R.Hanly, Elliot B. Koffman, Problem Solving and Program Design in

C, 5th Edition(2007), Pearson Education.

6. Bala gurusamy E, Programming in ANSIC, 4th Edition (2008), TMG.
7. Gottfried, ProgrammingwithC, 3rdEdition(2010), TMH.
8. RGDromey, HowtoSolveitbyComputer, 1stEdition(2006), 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	:	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: U21PC310CE
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:
<ol style="list-style-type: none">1. Examine and interpret basic concepts of Strength of materials and analyze statically determinate and indeterminate structures.2. Analyze simple beams subjected to various types of loading and plot shear force and bending moment diagrams and compute bending stresses.3. Define and analyze shear stresses in beams and plot shear stress distribution across cross section of beams4. Define and analyze problem of columns subjected to direct and bending stresses5. Define the concepts of compound stresses and strains in beams and also Investigate the behaviour of thin cylinder, spherical shells and thick cylinders	<ol style="list-style-type: none">1. Express understanding of the basic concepts and principles of Strength of materials and solve problems of composite sections, statically determinate and indeterminate structures.2. Construct shear force and bending moment diagrams for beams and compute stresses and strains in bending and shear in the cross section of beams subjected to transverse loading.3. Compute direct and bending stresses in columns and beams subjected to eccentric loading.4. Identify and interpret the governing equation for compound stress and strains and compute the principal stress and strains5. Compute stresses in thin cylinders, spherical shells and thick cylinders subjected to internal and external pressure.

UNIT-I: Simple Stresses and Strains: Definitions, types of stresses and strains. SI units, and notation. Hooke's law, modulus of elasticity, stress-strain curves for mild steel and typical engineering materials. Ductile and brittle materials. Working stress and factor of safety. Deformation of bars under axial loads; prismatic and non-prismatic bars. Deformations due to self-

weight. Bars of uniform strength. Poisson's ratio; volumetric strain and restrained strains. Relationship between elastic constants. Compound bars and temperature stresses. Statically indeterminate problems in tension and compression.

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

UNIT-III: Bending Stresses in Beams: Theory of simple bending. Moment of resistance, Elastic section modulus of section. Stresses in beams of various cross sections; flitched beams.

Shear Stresses in Beams: Distribution of transverse shear stresses over rectangular, circular, triangular, I- and T- sections.

UNIT-IV: Direct and Bending Stresses: Distribution of stresses over symmetrical sections under combined axial load and bending moment. Cores of solid and hollow circular and rectangular sections.

Compound stresses and strains: Principal stresses. Ellipse of stress. Mohr's circle for biaxial stresses. Principal strains. Introduction to failure theories.

UNIT-V: Thin Cylinders and spherical shells: Thin Cylinders subjected to internal fluid pressure; wire wound cylinders & shells

Thick Cylinders: Stresses under internal and external pressure. Compound cylinders.

Learning Resources:

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

8. Hibbeler.R., Mechanics of Materials, Pearson Publishers, 2017.
9. Bhavikatti.S.S, Strength of Materials, Vikas Publishers, 2013.
10. NPTEL Course (www.nptel.ac.in)

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

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

Duration of Internal Tests : 90 Minutes

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

DEPARTMENT OF CIVIL ENGINEERING
SURVEYING

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):3:0:0	SEE Marks:60	Course Code: U21PC320CE
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
<ol style="list-style-type: none">1. Learn the basic concepts and use of surveying in Civil Engineering2. Understand the measurement techniques and equipment used in land surveying such as chain/tape, compass, and level with respect to equipments used, methods, errors and analysis of data3. Acquire knowledge on use of theodolite and total station equipment, its adjustments, measurements, methods employed, errors and computation of data.4. Study the modern techniques in surveying with GPS, aerial photogrammetry, remote sensing,	<ol style="list-style-type: none">1. Employ basic surveying operations and computations for measurement of distances and angles using chain/tape and compass for the given site conditions in field2. Apply the principles of leveling to measure elevations of objects with respect to known points and prepare contour maps.3. Interpret the principles of measurement of angles with theodolite and total station, make traverse computations and solve for omitted measurements in traverse .4. 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 railways5. Apply the concepts of modern tools such as GPS, Remote sensing and aerial photogrammetry for measurement of details on surface of earth and relate to civil engineering problems

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

Distance Measurement: Chains and Tapes, Ranging.

Compass Surveying: Measurement of direction and angles. Types of compass, meridians and bearings, Magnetic declination, Dip, local attraction.

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

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

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

Traversing and Computations: Methods of traversing, Checks in open and closed traverse, Computation of latitude and departures, consecutive and independent coordinates, closing error and its adjustment by Bowditch method, Transit rule and Graphical method. Gale's traverse table, omitted measurements in traverse and their computations.

UNIT-IV:

Curves: types of curves, elements of curves, setting of simple curves using linear and angular methods. Compound curves – Elements – Solution to different cases. Reverse curves – Parallel straights and Non-parallel straights. Introduction to Transition curves, Vertical curves

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

Learning Resources:

1. Punmia B.C., Ashok Kumar Jain, Arun Kumar Jain, Surveying, Vol. 1 and 2, Laxmi Publications, 2018.
2. Arora K.R., Surveying, Vol.1, 2 and 3, Standard Publishers Distributors, 2019.
3. Duggal S K, Surveying Volume 1 and 2, Fifth edition, Mc. Graw Hill Education Pvt Ltd 2019.
4. Kanetker T.P. and Kulkarni S.V., Surveying and Levelling, Pune VidyarthiGruhaPrakshan, Pune, 2014.

5. Venkatramaiah C., A Text Book of Surveying, University Press, Hyderabad, 2013.
6. NPTEL course - Surveying course by Prof Bharat Lohani, IIT Kanpur - <http://www.nptelvideos.in/2012/11/surveying.html>
7. NPTEL course – Digital land Surveying and mapping course by Dr.Jayanta K Ghosh, IIT Roorkee - <https://nptel.ac.in/courses/105/107/105107158/>

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

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

Duration of Internal Tests : 90 Minutes

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

**DEPARTMENT OF CIVIL ENGINEERING
BUILDING MATERIALS AND CONSTRUCTION**

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):2 : 0 : 0	SEE Marks:60	Course Code:U20PC440CE
Credits: 2	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	At the end of the course, students will be able to:
<ol style="list-style-type: none">1. Expose students to the concepts of building planning and various aspects of green buildings.2. Acquire basic knowledge on conventional building materials and emerging building materials3. Study construction practices like scaffolding and form work, Stair cases.	<ol style="list-style-type: none">1. Apply the principles of planning and bylaws for planning of building2. Explain the characteristics of stones, bricks and timber.3. Describe properties of cement aggregate, mortar and illustrate the application of emerging building materials and paints, varnishes and water proofing materials in buildings.4. Review construction practices like scaffolding, form work , brick bonds and design of dog legged of stair cases.5. Understand sustainability and green building concepts.

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

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

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

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

UNIT-III: Cement: Chemical composition of cement, manufacturing

process. Specifications for Ordinary Portland Cement.

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

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

Cement Mortar: Proportions of Cement Mortar and uses.

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

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

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

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

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

Learning Resources:

1. Kumara Swamy N., Kameswara Rao A., Building Planning And Drawing, Charotar, Publications, 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.
7. IGBC Green Homes Rating System, Version 2.0., Abridged reference guide, 2013, Indian Green Building Council Publishers.
8. GRIHA version 2015, GRIHA rating system, Green Rating for Integrated Habitat Assessment.
9. Alternative building materials and technologies by K.S. Jagadish, B.V. Venkatarama Reddy and K.S. Nanjunda Rao.

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 LAB**

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):0:0:2	SEE Marks:50	Course Code: U21PC311CE
Credits: 1	CIE Marks:30	Duration of SEE: 3 Hrs

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

LIST OF EXPERIMENTS

1. Practice of direct and indirect ranging and measuring the distance using Chain.
2. Traversing by using Compass – plotting and adjustments.
3. Plane table surveying - Radiation and Intersection methods.
4. Plotting of the traverse for the given area using plane table.
5. Introduction to Levelling – Fly leveling using Auto Level
6. Profile leveling using auto level - Plotting Longitudinal section and Transverse sections

7. Measurement of horizontal angles by repetition & Reiteration method using Theodolite and calculate the area.
8. Traversing by using Theodolite – Distribution of errors using gales Traverse table
9. Measurement of vertical angle; Application to simple problems of height and distance by measuring angle of elevation.
10. Setting of simple curve by offset method
11. Setting of simple curve by Rankin's methods
12. Demonstration of minor surveying instruments and Total Station

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

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

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

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):0:0:2	SEE Marks:50	Course Code: U21PC321CE
Credits : 1	CIE Marks:30	Duration of SEE: 3 Hrs

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

LIST OF EXPERIMENTS

- 1. Building Planning & Orientation:** Functional planning of buildings and Orientation of the building for ventilation.
- 2. CAD:** Introduction to Computer Aided Drafting, Advantages and Disadvantages of CAD, List of CACED Software. Introduction and feature of drafting software.
- 3. Environment of drafting software:** Workspace, Application Menu, Quick Access Toolbar, Ribbon, Search for information, Pull-down menu, Status bar, Function keys.
Coordinate systems: absolute and relative, Cartesian and polar coordinate systems.
- 4. Basic Managing/ Display control Tools:** New, Save, new, Open, Close, Quit/ Exit, Undo, Redo, Limits, Units, Zoom, Pan, Steering Wheel, View Cube etc.
Basic Drafting Tools: Line, Polylines, Point, Circle, Arc, Spline, Ellipse, Rectangle, Polygons, Text, Hatch.

5. **Editing/ Inquiry Tools:** Erase, oops, Move, Copy, Mirror, Rotate, Scale, Fillet, Chamfer, Trim, Extend, Break, Join, Stretch, Offset, Array, Distance, Radius, Angle, Area, Volume.
6. **Dimensioning Tools:** Linear, Aligned, Radius, Diameter, Centre, Angular, Baseline, Continuous, Ordinate, Arc Length, Jogged Radius Dimension, Dimension Space, Dimension Break, Inspection Dimension, Multileader and its Style.
7. **Layer Tools:** Concepts and use of Layers in drafting software, drawing, Adding New layers, Editing and Managing Layers, List Properties, Use of Different Types of lines and their weightages.
Block/W-block and Attributes: Concept and Significance of Blocks in drafting software Drawings, Creating Blocks, Editing and Managing Blocks
8. Drawing of Plans, Elevations and Sections of various types of single Storey Residential Buildings.

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

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
PROGRAMMING FOR ENGINEERS LAB
(Common to Mech. & Civil)

SYLLABUS FOR B.E. II-SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code : U20ES211CS
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
1 Write, compile and debug programs in C.	1 Choose appropriate data type for implementing programs in C language.
2 Formulate solution to problems and implement in C.	2 Design and implement modular programs involving input output operations, decision making and looping constructs.
3 Effectively choose programming components to solve computing problems.	3 Implement search and sort operations on arrays.
	4 Implement programs on string handling.
	5 Design and implement programs to store data in structures and files.

Programming Exercise:

1. Finding maximum and minimum of given set of numbers.
2. Finding roots of a quadratic equation.
3. Basic calculator program using switch-case statement.
4. Sin x and Cos x values using series expansion.
5. Conversion of binary to decimal, octal, hexadecimal and vice versa.
6. Generating pyramid of numbers.
7. Recursion: factorial, Fibonacci.
8. Bubble sort and selection sort.
9. Linear search and binary search.

10. Generating Pascals triangle using arrays.
11. Matrix addition, multiplication and transpose using arrays.
12. String copy, palindrome, concatenation .
13. Programs on structures and unions.
14. Finding the number of characters, words and lines of given text file.
15. File handling programs.

Learning Resources:

1. YashavanthKanetkar, "Let us C", 16th Edition, BPB Publications, 2018.
2. BalagurusamyE, Programmingin ANSI C, 7thEdition, TMG, 2016.
3. ReemaTharaja "Introduction to C Programming", Second Edition, OXFORD Press,2016.
4. J.R. Hanly and E.B. Koffman"Problem Solving and Program Design in C", 7th Edition, Pearson education, 2012.
5. PradeepDey and Manas Ghosh, "Programming in C", Oxford Press, 2nd Edition, 2017.
6. <https://www.tutorialspoint.com/cprogramming/index.htm>
7. <https://onlinecourses.nptel.ac.in/noc18-cs10/preview>.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test:	2 Hours		

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING**

**SCHEME OF INSTRUCTION AND EXAMINATION (R-21)
BE (CIVIL ENGINEERING) III-SEMESTER ACADEMIC YEAR 2022 - 2023
(Students Admitted in 2021-22)**

INTERDISCIPLINARY COURSES OFFERED BY CIVIL ENGINEERING

Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
THEORY								
U21ES310CE	Mechanics of Materials	3	-	-	3	60	40	3
PRACTICALS								
U21ES311CE	Mechanics of Materials Lab	-	-	2	3	50	30	1

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

DEPARTMENT OF CIVIL ENGINEERING
MECHANICS OF MATERIALS

SYLLABUS FOR B.E. III-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U21ES310CE
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
<ol style="list-style-type: none">1. Learn the analysis of members subjected to axial and transverse loads.2. Assess the behavior of columns subjected to axial loads and compute stresses in beams due to bending.3. Analyse the stresses developed in shafts, springs due to torsion and internal pressure in cylinders.	<ol style="list-style-type: none">1. Analyse members subjected to axial loads including thermal effects using basic concepts of Mechanics of materials.2. Draw shear force and bending moment diagrams in statically determinate beams.3. Compute stresses and strains in bending, shear and principal stresses.4. Determine the deflection of statically determinate beams subjected to UDL and point loads using double integration method and apply Euler's theory for long columns.5. Compute stresses in circular shafts for torsion, springs subjected to axial load and stresses induced in cylinders.

UNIT-I: Stresses and Strains: Definitions, types of stresses and strains. Elasticity and plasticity. Hooke's law. stress-strain diagrams for engineering

materials. Modulus of elasticity. Poisson's ratio. Relationship between elastic constants. Linear and volumetric strains. Bars of uniform strength. Temperature stresses. Compound bars.

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

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

UNIT-IV:Deflections: Slope and deflections by the method of double integration in cantilever, simply supported beams and beams with overhangs 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, NewYork, 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: U21ES311CE
Credits : 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
<ol style="list-style-type: none">1. Determine the properties of materials under the action of various loads.2. Learn the ability to work in a team and make effective presentations.	<ol style="list-style-type: none">1. Determine Young's Modulus of materials of beams by conducting deflection test.2. Assess the quality of materials by conducting hardness test and impact test and also learn the operation of universal testing machine (UTM).3. Determining modulus of rigidity of materials by conducting torsion test and spring test.4. Practise working as a team member and lead a team.5. Demonstrate professional behaviour in conducting the experiments and presenting the results effectively.

List of Experiments

1. Determination of Young's modulus by conducting Deflection test on Cantilever beam
2. Determination of Young's modulus by conducting Deflection test on Simply supported beam
3. Izod Impact test
4. Direct tension test on metal rods
5. Brinnell and Rockwell Hardness test
6. Compression test on brittle and ductile materials

7. Determination of modulus of rigidity by conducting tension test on a helical spring
8. Determination of modulus of rigidity by conducting compression test on a helical spring
9. Determination of modulus of rigidity by conducting torsion test
10. Determination of modulus of elasticity by conducting deflection test on fixed beam
11. Determination of modulus of elasticity by conducting deflection test on continuous beam
12. Bend test on metal rod.

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

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING**

**SCHEME OF INSTRUCTION AND EXAMINATION (R-21)
BE (CIVIL ENGINEERING) III-SEMESTER (BRIDGE COURSE) ACADEMIC YEAR 2022 - 2023
(Students Admitted in 2021-22)**

INTERDISCIPLINARY COURSES OFFERED BY CIVIL ENGINEERING

Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
THEORY (Civil & Mechanical Engineering)								
UB21ES340CE	Mechanics for Engineers	2	-	-	3	50	-	-

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:UB21ES340CE
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
<ol style="list-style-type: none">1. To learn the resolution of a system of spatial forces.2. To assess the frictional forces on rigid body.3. To understand the concepts of dynamics and its principles.4. To explain kinetics and kinematics of particles, projectiles, curvilinear motion and centroidal motion.5. To impart the concepts of work-energy method and its applications to rectilinear translation, centroidal motion.	<ol style="list-style-type: none">1. Judge whether the body under the action of spatial force system.2. Analyse equilibrium of a body subjected to a system of forces.3. Solve problem of bodies subjected to friction.4. Distinguish between statics and dynamics and differentiate between kinematics and kinetics.5. Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear motion.

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

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

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

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

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

translation.

Learning Resources:

1. Singer F.L., "Engineering Mechanics", Harper & Collins, Singapore, 2010.
2. Timoshenko S.P. and Young D.H., "Engineering Mechanics", McGraw Hill International Edition, 2014.
3. Andrew Pytel, Jaan Kiusalaas., "Engineering Mechanics", Cengage Learning, 2014.
4. Beer F.P. and Johnston E.R., "Jr. Vector Mechanics for Engineers", TMH, 2004.
5. Hibbeler R.C. & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2008.
8. Meriam. J. L., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2008.
9. NPTEL Course (www.nptel.ac.in)
10. Virtual labs (www.vlab.co.in)

**OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN
B.E. III SEMESTER**

Dept	Title	Code	credits
Civil	Green Buildings	U210E310CE	2
CSE	Fundamentals Of ScriptingLanguage	U210E310CS	2
CSE	Cyber Security	U210E320CS	2
ECE	Principles of Communication Engineering	U210E320EC	2
EEE	Non Conventional Energy Sources	U200E310EE	2
IT	Fundamentals of Data Structures	U210E310IT	2
IT	Introduction to Linux	U210E320IT	2
Mech.	Geometric Modelling	U210E310ME	2
Mech.	Basic Heat Transfer For Electronic Systems	U210E330ME	2
Maths	Linear Algebra	U210E310MA	2
Chemistry	Battery science and Technology	U210E310CH	2
Chemistry	Corrosion science and it'sapplication	U210E320CH	2
Physics	Smart Materials & Applications	U210E310PH	2
H&SS	Learning To Learn	U210E310EH	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: U21OE310CE
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:
<ol style="list-style-type: none">1. Learn the principles of planning and orientation of buildings.2. Environmental implications of natural and building materials along with green cover3. Acquire knowledge on various aspects of green buildings	<ol style="list-style-type: none">1. Explain the principles of building planning, its bylaws and provide facilities for rainwater harvesting2. Relate the need of Green Technology3. Understand the concepts of green building technologies4. Understand rating systems of GRIHA IGBC and LEED

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

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

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

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

Learning Resources:

1. Kumara Swamy N.Kameswara Rao A., Building Planning And Drawing, Charotar, Publications, 2013.
2. Shahane, V. S, "Planning and Designing Building", Poona, Allies Book Stall, 2004.
3. Michael Bauer, Peter Möslle 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
FUNDAMENTALS OF SCRIPTING LANGUAGE (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:U210E310CS
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 2. Learn programming and solve problems using Python language	1. Design python programs using arithmetic expressions and decision making statements 2. Design modular python programs using functions 3. Develop programs using strings and list 4. Develop programs using tuples and dictionaries

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

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

Iteration: while statement

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

UNIT-III: Strings: string length, string traversal, string slices and string comparison with examples, strings are immutable, find function, string module
List: list values, accessing elements, list traversal, list length, list membership, list and for loop, list operations with examples

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

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

Learning Resources:

1. Downey A, How to think like a Computer Scientist :Learning with Python, 1stEdition(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 andDesign, 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

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

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

DEPARTMENT OF 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: U210E320CS
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

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

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

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

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

UNIT-IV: MALICIOUS CODE, DEFENSE & ANALYSIS TECHNIQUES:

Self-replicating replicating code, Worms, Viruses, Evading Detection and Elevating Privileges: Obfuscation, Spyware, Token Kidnapping, Memory Forensics, Honey pots, 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 Sunit Belpure, 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 Test: 90 minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
PRINCIPLES OF COMMUNICATION ENGINEERING
(OPEN ELECTIVE)

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

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:U21OE320EC
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Distinguish analog and digital Modulation techniques used in various Communication systems.	On completion of the course, students will be able to <ol style="list-style-type: none">1. Analyze the power and transmission bandwidth of Amplitude and Frequency Modulated signals.2. Familiarize the process of reproduction of base band signal.3. Analyze various pulse analog and pulse digital Modulation Techniques.4. Understand the transmission of binary data in communication systems.

UNIT - I

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

UNIT - II

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

UNIT - III

Signal Sampling and Analog Pulse Communication: Ideal Sampling, Pulse Amplitude Modulation, Pulse Width Modulation, Pulse Position Modulation.

Digital Communication Techniques: Quantization, Digital Transmission of Data, Parallel and Serial Transmission, Data Conversion, Time Division Multiplexing, Pulse Code Modulation, Delta Modulation.

UNIT - IV

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

Learning Resources:

Louis E. Frenzel, Principles of Electronic Communication Systems, 3rd Edition. Tata Mcgraw Hill.

Wayne Tomasi, Electronic Communications Systems, 5th Edition, Pearson Education.

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

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

Duration of Internal Test: 90 minutes

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NON CONVENTIONAL ENERGY SOURCES

Open Elective-I

SYLLABUS FOR B.E. III SEMESTER

L: T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code: U21OE310EE
Credits:2	CIE Marks: 40	Duration of SEE: 3Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	On completion of the course, students will be able to
To provide a survey of the most important renewable energy resources and the technologies for harnessing these resources within the framework of a broad range of simple to state-of-the-art energy systems.	<ol style="list-style-type: none">1. Demonstrate the generation of electricity from various Non-Conventional sources of energy and solar power generation2. Illustrate the generation of energy from wind and generation of energy from waste3. Demonstrate the generation of energy by biomass and fuel cells4. Illustrate the ocean and geo thermal energy generation

UNIT-I: Introduction and Solar Energy:

Introduction: Need for Non-conventional energy sources, Types of Non-Conventional energy sources. Renewable energy across the Global and in India. Renewable energy for rural applications, Renewable energy for urban, industrial and commercial applications

Solar Energy: Solar cell fundamentals: Semiconductors, Photovoltaic effect, Solar PV cell, module, panel, array, Solar cell operating characteristics: Voltage-current characteristic, energy losses, maximising the performance. Applications of solar energy, Solar energy program in India, Case study

UNIT-II: Wind Energy and Waste to Energy:

Wind Energy: Nature of wind, Basic components of Wind Energy Conversion System(WECS), Power extraction from the wind, Applications of wind energy. Wind energy program in India, Case Study

Waste to Energy: Key issues, Waste recovery management, Case study

UNIT-III: Biomass Energy and Fuel Cells: Biomass Energy: Definition, Bio fuels, Biomass resources, Biomass conversion technologies: Incineration- Thermo chemical conversion- Bio- chemical conversion. Advantages and disadvantages of biomass energy, Case study

Fuel Cells: Definition-Classification of fuel cells, Principle of operation, Hydrogen-oxygen fuel cell, Alkaline fuel cell, Proton exchange membrane fuel cell, Molten carbonate fuel cell, Solid oxide electrolyte cells, Comparison of fuel cells- Advantages and Disadvantages of fuel cells-Applications of Fuel cells. Case study

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

Geothermal Energy: Geothermal resources- Vapour dominated geothermal plant- Liquid dominated geothermal plant- Applications of Geothermal Energy, Case study

Learning Resources:

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

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

1. No. of Internal Tests	: 2	Max. Marks for each Internal Test	: 30
2. No. of Assignments	: 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
FUNDAMENTALS OF DATA STRUCTURES (Open Elective-I)**

SYLLABUS FOR B.E. III-SEMESTER(for other Branches)

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code: U21OE310IT
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
Explore efficient storage mechanisms for easy access, design and implementation of various data structures.	<ol style="list-style-type: none">1. Identify appropriate linear data structure to solve a problem.2. Illustrate the usage of linked lists for various applications3. 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 Singlylinked list, Dynamically Linked Stacks and Queues.

UNIT – III:

Doubly linked list: Introduction, 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

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

Duration of Internal Test: 90 minutes

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

DEPARTMENT OF INFORMATION TECHNOLOGY
INTRODUCTION TO LINUX (Open Elective – I)
(Common for CIVIL, ECE, EEE & MECH)

SYLLABUS FOR –III SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:U21OE320IT
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Acquire basic skills for using Linux operating system.	On completion of the course, students will be able to: <ol style="list-style-type: none">1. Install Linux operating system and use desktop environment.2. Identify and use Linux utilities to create and manage simple file processing operations.3. Organize directory structures with appropriate security.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 LinuxDesktop 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

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

Duration of Internal Test: 90 minutes

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

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

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:U21OE310ME
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objective of this course is to understand wire-frame modelling & transformations, surface, solid modelling and assembly modelling techniques.	On completion of the course, students will be able to <ol style="list-style-type: none">1. identify various Wire frame modelling entities and their representations.2. interpret synthetic curve representations and various 2D transformations for geometric model by matrix approach.3. development of various surfaces using surface modelling.4. analyze various 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

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

Duration of Internal Test: 90 minutes

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

**DEPARTMENT OF MECHANICAL ENGINEERING
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:U21OE330ME
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
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	On completion of the course, students will be able to <ol style="list-style-type: none">1. understand and apply the first law of thermodynamics to various engineering problems2. understand and apply the second law of thermodynamics to various engineering problems3. 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 ELECTRONICEQUIPMENT

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

Learning Resources:

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

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

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

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

DEPARTMENT OF MATHEMATICS
LINEAR ALGEBRA (Open Elective)

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:U21OE310MA
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

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

UNIT – I (8 classes)

Vector Spaces-Definition of a Vector Space, Subspaces, Basis and Dimension, Coordinates and Change of Basis.

UNIT – II (6 classes)

Linear Transformation -I

Definition of Linear Transformation- Properties of Linear Transformations – Product of Linear Transformations – Algebra of Linear Operators- Linear sum-Scalar multiple-Composition of maps.

UNIT – III (6 classes)

Linear Transformation -II

Range and kernel of a linear map – Dimension of Range and Kernel - Rank

and nullity – Inverse of linear transformation - Rank nullity theorem (without Proof)- Matrix of Linear Transformation.

UNIT – IV (8 classes)

Inner Product Spaces-The Dot Product on \mathbb{R} and Inner Product Spaces, Orthonormal Bases, Orthogonal Complements- Gram-Schmidt's Orthonormalization process.

Learning Resources:

1. Introduction to Linear Algebra with Application, Author : Jim DeFranza, Daniel Gagliardi, Publisher : Tata McGraw-Hill
2. An Introduction to Linear Algebra, V.Krishna Murthy, V.P Mainra, J.L Arora, Affiliated to East-West Press Pvt Ltd

Reference Books:

- 1 Elementary Linear Algebra, Author: Anton and Rorres, Publisher: Wiley India Edition.
- 2 Advanced Engineering Mathematics, Author : Erwin Kreysig, Publisher : Wiley Publication
- 3 Elementary Linear Algebra, Author : Ron Larson, Publisher : Cengage Learning

Online Resources :

- 1 <http://mathworld.wolfram.com/topics>
- 2 <http://www.nptel.ac.in/course.php>

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

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

Duration of Internal Test: 90 minutes

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

**DEPARTMENT OF CHEMISTRY
BATTERY SCIENCE AND TECHNOLOGY (OPEN ELECTIVE)**

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:U22OE310CH
Credits: 2	CIE Marks: 40	Duration of SEE :1.5 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are	On completion of the course, students will be able to
<ol style="list-style-type: none">1. Introduce the various terms to understand the efficiency of batteries.2. Know the relevant materials required for the construction of primary and secondary batteries.3. Familiarize with the reactions involved during charging and discharging processes.4. Emphasise the need of fuel cells and the concept of their construction and functioning.	<ol style="list-style-type: none">1. Discuss the construction, electrochemistry, technology and applications of selected primary batteries2. Discuss the construction, electrochemistry, technology and applications of few secondary batteries3. Explain the working principle, electrochemistry, technology and applications of prominent fuel cells4. Evaluate different batteries or fuel cells in order to select a suitable battery or fuel cell for a given application

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

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

UNIT-III: SECONDARY BATTERIES: Construction, chemistry and technology of maintenance free lead acid battery (MFLA), valve regulated lead acid battery (VRLA), absorbed glass mat lead acid battery (AGMLA) - comparison 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", Dhanpat Rai 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 Materials by R. P. Mani and K. N. Mishra, CENGAGE learning

5. Shasi Chawla, "Text Book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 2008.

1. Dell R. M. and Rand D. A. J., "Understanding Batteries", Royal Society of Chemistry, UK, 2001.

2. Derek Pletcher and Frank C. Walsh, "Industrial Electrochemistry", Chapman and Hall, New York, 1993.

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

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

Duration of Internal Test: 90 minutes

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

DEPARTMENT OF CHEMISTRY
CORROSION SCIENCE AND ITS PREVENTION
(Open Elective)

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:U22OE320CH
Credits: 2	CIE Marks: 40	Duration of SEE :1.5 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are	On completion of the course, students will be able to
<ol style="list-style-type: none">1. Acquaint with the causes and factors influencing the rate of corrosion2. Understand the different types of corrosion like dry, wet and galvanic corrosion and their relative impact3. Familiarize with various preventive methods of corrosion such as cathodic protection, use of inhibitors, coatings, etc.4. Familiarize with industrial coating methods like electroplating, electrolessplating.	<ol style="list-style-type: none">1. Explain different types of corrosion and factors that affect corrosion and passivation of metals.2. Select a suitable metallic coating, organic coating and inhibitors for corrosion control of the equipment in a given application.3. Discuss the principles and applications of cathodic protection and surface conversion coatings for corrosion control.4. Apply the knowledge of various methods of corrosion control to suggest a solution for corrosion control of a given equipment in a given industrial application.

UNIT-I: CHEMICAL AND ELECTROCHEMICAL CORROSION

Introduction - gravity, cause, chemical and electrochemical corrosion, Pilling – Bed worth rule, effect of nature of oxide layer on rate of chemical corrosion. Galvanic corrosion, electrochemical series and galvanic series. Formation of anodic and cathodic areas, Differential aeration corrosion -pitting, waterline corrosion, crevice corrosion, stress corrosion and corrosion fatigue. Passivation of metals, polarization curve of passivating metals, effect of pH and potential for iron (pourbaix diagram) and the polarization curve of iron.

Factors influencing corrosion

- a. Nature of metal: Relative position of metal in galvanic series, over voltage, relative areas of anode and cathode and nature of corrosion product.
- b. Nature of environment: Temperature, pH, humidity and dissolved oxygen.

UNIT-II: CORROSION CONTROL BY METALLIC COATINGS

Metallic coatings: Types - anodic and cathodic. Pre treatment of surface of base metal. Methods of application of metallic coatings: Hot dipping-galvanization - applications of galvanized RCC steel bars. Cladding, electroplating and electroless plating- Principle and their differences. Electroplating of Cu and Cr on Fe, electroless plating of Ni and Cu on insulators, Preparation of printed circuit board (PCB) by electrolessplating.

UNIT-III: CORROSION CONTROL BY ORGANIC COATINGS AND INHIBITORS

Organic Coatings: Paints – constituents and their functions. Vitreous enamel coatings. Varnishes. Super hydrophobic and self healing coatings. Epoxy coatings on RCC steel bars- impervious coatings.
Corrosion inhibitors: Anodic, cathodic and vapour phase inhibitors.

UNIT-IV: CORROSION CONTROL BY CATHODIC PROTECTION AND SURFACE MODIFICATION

Cathodic protection: Principle, sacrificial anodic protection (SAP), impressed current cathodic protection (ICCP). Application of cathodic protection for bridges, ship hulls and underground pipelines.
Surface conversion coatings: Carburizing, nitriding, cyaniding.

Learning Resources:

1. P. C. Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai Pub, Co., New Delhi (2002)
2. S. S. Dara "A text book of engineering chemistry" S. Chand and Co. Ltd., New Delhi (2006).
3. Shasi Chawla, "Text Book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi (2008).
4. Wiley Engineering chemistry, Wiley India pvt Ltd, II edition.
5. Chemistry in engineering and technology by J. C. Kuriacose and Rajaram.

Suggested Reading:

1. Principles and prevention of corrosion: Denny A. Jones, Prentice Hall, 1996.
2. Derek Pletcher and Frank C. Walsh, "Industrial Electrochemistry", Chapman and Hall, New York, 1993
3. Fundamentals of Corrosion: Michael Henthorne, Chemical Engineering
4. Corrosion Engineering: Mars G Fontana, Mc Graw Hill, 1987

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

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

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

**DEPARTMENT OF PHYSICS
SMART MATERIALS & APPLICATIONS (OPEN ELECTIVE)**

SYLLABUS FOR B.E.III-SEMESTER

L:T:P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:U21OE310PH
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

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

UNIT I: PIEZO AND FERRO MATERIALS

Piezo electric effect and inverse piezoelectric effect, Piezo electric materials, Structure of Quartz crystal, Piezoelectric oscillator, Magnetostriction, Magnetostriction oscillator, piezo-electric sensors, applications of Piezo-electric materials.

Characteristics and properties of ferro-electric materials, Structure of Barium Titanate, Curie-Weiss law, applications of Ferro electric materials

UNIT II: PYRO AND THERMO-ELECTRIC MATERIALS

Pyroelectricity: pyro electric effect, pyro electric materials, pyro-electric sensors.

Thermoelectricity: thermoelectric effect, Seebeck effect, Peltier effect, thermoelectric sensor, Properties and applications of thermoelectric materials, thermoelectric generator and Thermoelectric cooler.

UNIT III: SHAPE MEMORY MATERIALS

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

UNIT-IV: CHROMIC MATERIALS

Electro-chromaticity, Electro-chromic materials, Electro-chromic sensors and devices.

Photo-chromaticity, Photo-chromic materials, Photo-chromic sensors and devices.

Thermo-chromaticity, thermo-chromic materials, thermo-chromic sensors and devices.

Smart fluids: Magneto-rheological and Electro-rheological fluids.

Learning Resources:

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

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

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

Duration of Internal Test: 90 minutes

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES
LEARNING TO LEARN
(Open Elective)

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:U21OE310PH
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The Students will be able to:	On completion of the course, students will be able to
The course will enable the learners to: <ol style="list-style-type: none">1. Develop effective study skills, and enable students to cut down on the number of hours spent studying.2. Explore illusions of competence in learning, the challenges of overlearning, and the advantages of interleaving.3. Handle procrastination and learn for long term.4. Plan, prioritise and carry out tasks based on goals and priority.	At the end of the course the learners will be able to: - <ol style="list-style-type: none">1. Get learners maximize their learning in a stipulated amount of time.2. Become competent learners and learn creatively.3. Meet deadlines, submit progress reports and recall what has been learnt for effective usage.4. Set Performance Standards and take initiative based on set goals.

OVERVIEW:

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

UNIT 1: STUDY SKILLS

Good study skills can increase a student's confidence, competence, and self-esteem. They can also reduce anxiety about tests and deadlines. This module

is designed to develop effective study skills, and enable students to cut down on the number of hours spent studying, leaving more time for other important things in their life

- 1.1 Study Skills Checklist
- 1.2 Learning Styles
- 1.3 Habits of Effective Students
- 1.4 Using the Focused and Diffuse Modes
- 1.5 Introduction to memory and Memory Technique

UNIT 2: Chunking

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

- 2.1 Knowledge Chunking
- 2.2 Skill and Will
- 2.3 Sleep and Learning

UNIT 3: Procrastination and Memory

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

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

UNIT 4: Renaissance Learning and Unlocking Your Potential

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

4.1 Psychology of Goal Setting

4.2 Criteria for Goal Setting

4.3 Steps in Goal Setting

4.4 Visioning

4.5 Strategy & Action Plan

4.6 Goal Progress Review

LEARNING RESOURCES

learn.talentsprint.com

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

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

Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-21)
BE (CIVIL ENGINEERING) IV-SEMESTER ACADEMIC YEAR 2022 - 2023
(Students Admitted in 2021-22)

Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			Credits
		Hours per Week			Duration in Hrs	Maximum Marks		
		L	T	P/D		SEE	CIE	
THEORY								
U21HS430EH	Skill Development Course-III (Aptitude-II)	1	-	-	2	40	30	1
U21BS410MA	Numerical Methods, Probability & Statistics	3	-	-	3	60	40	3
U21ES410CS	Principles of Data Structures	3	-	-	3	60	40	3
U21PC410CE	Strength of Materials – II	3	-	-	3	60	40	3
U21PC420CE	Concrete Technology	2	-	-	3	60	40	2
U21PC430CE	Fluid Mechanics	3	-	-	3	60	40	3
U21PE410CE	Skill Development Course-IV (Technical Skills-I)	1	-	-	2	40	30	1
U21OEXXXXX	Open Elective-II	3	-	-	3	60	40	3
PRACTICALS								
U21ES411CS	Principles of Data Structures Lab	-	-	2	3	50	30	1
U21PC411CE	Strength of Materials Lab	-	-	2	3	50	30	1
U21PC421CE	Surveying-II Lab	-	-	2	3	50	30	1
U21PC431CE	Fluid Mechanics Lab	-	-	2	3	50	30	1
<i>Student should complete one online certificate course equivalent to 2 credits during III-VI Semester</i>								
Total		19	-	8		640	420	23
Grand Total		27				1060		
<i>Note: The left over hours are to be allotted to CCA-II/ Sports / Library / Mentor Interaction / based on the requirement.</i>								

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

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

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week):2 : 0 : 0	SEE Marks:40	Course Code: U21HS430EH
Credits: 1	CIE Marks:30	Duration of SEE: 3 Hrs

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

**UNIT 1: QUANTITATIVE APTITUDE- ARITHMETIC ABILITY
ADVANCED**

- Time speed and distance
- Boats and Streams
- Problems on trains

UNIT 2: REASONING ABILITY- LOGICAL REASONING

- Seating Arrangements- Linear; Circular; Complex
- Venn diagrams
- Syllogism
- Cubes & Cuboids
- Dices

UNIT 3: REASONING ABILITY- NON VERBAL REASONING

- Figure Series
- Directions
- Clocks
- Calendars

UNIT 4: QUANTITATIVE APTITUDE -

- Mensuration Part -1
- Mensuration Part -2
- Logarithms

UNIT 5: QUANTITATIVE APTITUDE

- Permutations and combinations
- Probability

METHODOLOGY

- Demonstration
- Presentations
- Expert lectures

ASSESSMENTS

- Online assignments
- Individual and Group
- Audio-visual lessons

Learning Resources:

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

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

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

Duration of Internal Tests : 90 Minutes

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

DEPARTMENT OF MATHEMATICS
NUMERICAL METHODS, PROBABILITY & STATISTICS

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P(Hrs./week):3:1:0	SEE Marks : 60	Course Code : U21BS410MA
Credits : 3	CIE Marks : 40	Duration of SEE : 3Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>The course will enable the students to:</i>	<i>At the end of the course students will be able to:</i>
1 Study the methods of interpolation, apply numerical methods to interpolate.	1. 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 of 4th order(without proofs)

UNIT-III: Probability Distribution: Random Variables - Discrete and Continuous Random variables-Properties- Distribution functions and densities - Normal Distribution-Properties-Standard normal variate.

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- Second order curve (parabola) - Exponential curve- - Correlation – Karl Pearson's Co-efficient of Correlation.

Learning Resources:

1. R.K. Jain & S.R.K. Iyengar, Advanced Engineering Mathematics, Third Edition, Narosa Publications, 2007.
2. Higher Engineering Mathematics, Dr.B.S Grewal 40th Edition, Khanna Publishers.
3. Probability, Statistics and Random Processes, T. Veerarajan , Tata McGraw Hill Education Private Ltd.
4. Advanced Engineering Mathematics, Kreyszig E, 8 th Edition, John Wiley & Sons Ltd, 2006.
5. A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.
6. Fundamentals of Mathematical Statistics, Gupta & Kapoor, Sultan chand & sons, New Delhi.
7. <http://mathworld.wolfram.com/topics>
8. <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 COMPUTER SCIENCE & ENGINEERING

PRINCIPLES OF DATA STRUCTURES

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

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : U21ES410CS
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
<ol style="list-style-type: none">1. Understand Basic linear and non-linear data structures and learn techniques of recursion2. Understand concepts of Linked lists3. Understand Concepts of Stacks and queues4. Understand Concepts of Trees5. Understand Concepts of Graphs and different sorting and searching techniques and their complexities.	<ol style="list-style-type: none">1. Understand the basic concepts of data structures.2. Understand the notations used to analyze the performance of algorithms.3. Choose and apply an appropriate data structure for a specified application.4. Understand the concepts of recursion and its applications in problem solving.5. Demonstrate a thorough understanding of searching and sorting algorithms.

UNIT-I : Introduction: Data Types, Data structures, Types of Data Structures, Operations, ADTs, Algorithms, Comparison of Algorithms, Complexity, Time- space tradeoff.

Recursion: Introduction, format of recursive functions, recursion Vs. Iteration, examples.

UNIT-II: Linked Lists: Introduction, Linked lists and types, Representation of linked list, operations on linked list, Comparison of Linked Lists with Arrays and Dynamic Arrays.

UNIT-III: Stacks and Queues: Introduction to stacks, applications of stacks, implementation, and comparison of stack implementations. Introduction to queues, applications of queues and implementations, Priority Queues and applications.

UNIT-IV: Trees: Definitions and Concepts, Operations on Binary Trees, Representation of binary tree, Conversion of General Trees to Binary Trees, Representations of Trees, Tree Traversals, Binary search Tree.

UNIT-V: Searching and Sorting: Linear searching, binary Searching, sorting algorithms: bubble sort, selection sort, quick sort, merge sort.

Learning Resources:

1. Narasimha Karumanchi, "Data Structures and Algorithms MadeEasy", Career Monk Publications, 2017
2. Horowitz E, Sahni S., and Susan Anderson-Freed," Fundamentals ofData structures in C", Silicon Pr; 2 edition (1 August 2007)
3. ReemaThareja, "Data Structures using C", Oxford, 2014.
4. Kushwaha D. S. and Misra A. K, "Data structures A ProgrammingApproach with C", PHI.
5. Seymour Lipschutz," Data Structures with C", McGraw Hill Education,2017.

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 CIVIL ENGINEERING
STRENGTH OF MATERIALS – II

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week):2: 0 : 2	SEE Marks:60	Course Code: U21PC410CE
Credits: 2	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will be able to	Upon the completion of this course students will be able to
<ol style="list-style-type: none">1. Examine and interpret the deflection of simply supported, cantilever and overhanging beams2. Analyze propped cantilevers, fixed and continuous beams for deflection, shear and bending moment3. Locate shear centre and draw shear flow in simple sections.4. Analyze torsion of circular shafts and analyse helical and bending springs and examine the concept of strain energy5. Investigate the behaviour of columns and struts.	<ol style="list-style-type: none">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 diagrams2. Determine shear centre for simple sections.3. Compute the torsional shear stress across the cross section of circular shafts.4. Compute stresses in helical springs and compute strain energy in bars subjected to axial and flexural deformation5. 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 – Gordon's formula, straight-line formula, effect of end conditions, slenderness ratio, eccentrically loaded columns, and Secant and Perry's formulae.

Learning Resources:

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

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

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

Duration of Internal Tests : 90 Minutes

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

DEPARTMENT OF CIVIL ENGINEERING
CONCRETE TECHNOLOGY

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week):2 : 0 :0	SEE Marks:60	Course Code: U21PC420CE
Credits: 2	CIE Marks:40	Duration of SEE: 3 Hrs

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

UNIT-I:Constituents of Concrete: Types of cements and their composition. Tests on various properties of aggregates.

Properties of fresh concrete: Mixing and batching. Workability, factors effecting workability, various tests procedures. Segregation and bleeding. Vibration of concrete. Types of vibrators and their influence on composition. Analysis of fresh concrete.

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

UNIT-III : Mix design of concrete: Basic considerations, Parameters of

mix design. Factors in the choice of mix proportions and their influence. Quality control. Various methods of mix design. I.S.Code method. and ACI methods.

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

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

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

Learning Resources:

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

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

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

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

DEPARTMENT OF CIVIL ENGINEERING
FLUID MECHANICS

SYLLABUS FOR B.E.IV-SEMESTER

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

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	Upon the completion of this course students will be able to
<ol style="list-style-type: none">1. Learn the properties of fluids2. Apply the laws of conservation of mass, energy and momentum for fluid flow.3. Assess the phenomenon of flow in pipes and boundary layer	<ol style="list-style-type: none">1. Compute properties of fluid and discuss about fluid statics2. Understand various aspects of Fluid kinematics3. Formulate equations based on conservation of mass, energy and momentum. Analyse forces on nozzles and describe devices use for discharge.4. Compute Reynolds number, formulate equations for laminar and turbulent flow through pipes and water hammer in pipes.5. Explain growth and separation of boundary layer and evaluate drag & lift forces for various shapes of bodies in a medium

UNIT-I: Fluid Properties: Definition of fluid, properties of fluids, density, specific weight, specific volume, specific gravity, bulk modulus, vapour pressure, viscosity. Newton's law of viscosity and its applications. Capillarity and surface tension.

Measurement of Pressure: Piezometer and U tube Manometers. Bourdon Gauge. Absolute pressure and Gauge pressure.

Hydro Statics: Pascal law, buoyancy, metacentre and metacentric Height, Total pressure and centre of pressure on Horizontal plane and vertical plane surfaces.

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

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

Law of Energy Conservation: Bernoulli's equation from integration of Euler's equation. Significance of the Bernoulli's equation, limitations, modifications and application to real fluid flows, venturimeter 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-V: Boundary layer: Boundary layer growth and separation, methods to control separation, drag and lift forces, drag on airfoil and sphere, Principle of streamlining. Displacement, energy & momentum thickness streamlined body and bluff body, Magnus effect.

Learning Resources:

1. Modi P.N. and Seth S.M., Hydraulics and Fluid Mechanics including Hydraulics Machines, Standard Book House, Delhi, 2019.
2. Bansal R.K., A Textbook Of Fluid Mechanics And Hydraulic Machines, Laxmi Publications, 2018.
3. Ojha C.S.P., Berndtsson R., Chandramouli P.N., Fluid Mechanics and Machinery, Oxford University Press, 2012.
4. Rajput R.K., Fluid Mechanics and Hydraulic Machines, S. Chand & Co., 2013.
5. K Srinivasa Raju and D Nagesh kumar, " Fluid Mechanics problem solving using MATLAB" Prentice Hall of India, 2020
6. NPTEL Course (www.nptel.ac.in)
7. MIT Open Course Ware: *Fluid Dynamics*, <https://ocw.mit.edu/courses/2-06-fluid-dynamics-spring-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		

With effect from the Academic Year 2022-23 (R21)

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

**DEPARTMENT OF CIVIL ENGINEERING
SKILL DEVELOPMENT COURSE-IV (Technical Skills-I)**

SYLLABUS FOR B.E. IV-SEMESTER

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
PRINCIPLES OF DATA STRUCTURES LAB

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

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code : U21ES411CS
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
Design and implement abstractions of various data structures and their practical applications.	<ol style="list-style-type: none">1. Perform operations on Abstractions like stacks, queues, linked lists.2. Implement problems involving trees and graphs.3. Choose the right data structure based on the requirements of the problem.

1. Menu driven program that implements Stacks using arrays for the following operations
a) create b)push c)pop d) peek
2. Implementation of Infix to Postfix Conversion and evaluation of postfix expression.
3. Menu driven program that implements Queues using arrays for the following operations
a)create b)insert c)delete d) display
4. Menu driven program that implements Circular Queues for the following operations
a)create b)Insert c)delete d) display
5. Implementation of Singly Linked List, Stack using Singly Linked List, Queue using Singly Linked List.
6. Implementation of polynomial operations using Linked List.

7. Implementation of Doubly Linked List, Circular linked list.
8. Implementation of Operations on Binary Tree (Insert, Delete, Level Order, Search)
9. Implementation of Recursive and Iterative Traversals on Binary Trees.
10. Implementation of Operations on Binary Search Tree.
11. Implementation of Quick Sort.
12. Implementation of merge Sort.

Suggested Reading:

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

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: U21PC411CE
Credits: 1	CIE Marks:30	Duration of SEE: 3 Hrs

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

List of Experiments

1. Determination of Young's modulus by conducting deflection test on Cantilever beam
2. Determination of Young's modulus by conducting deflection test on Simply supported beam
3. Izod Impact test
4. Direct tension test on metal rods
5. Brinnell and Rockwell Hardness test
6. Compression test on brittle and ductile materials
7. Determination of modulus of rigidity by conducting tension test on a helical spring
8. Determination of modulus of rigidity by conducting compression test

9. Determination of modulus of rigidity by conducting torsion test
10. Determination of modulus of elasticity by conducting deflection test on fixed beam
11. Determination of modulus of elasticity by conducting deflection test on continuous beam
12. Bend test on metal rod

No. of Internal Tests: 01 Max. Marks for Internal Test: 12

Marks for day-to-day laboratory class work 18

Duration of Internal Test: 2 Hours

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

DEPARTMENT OF CIVIL ENGINEERING
SURVEYING-II LAB

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week): 0 : 0 : 2	SEE Marks:50	Course Code: U21PC421CE
Credits: 1	CIE Marks:30	Duration of SEE: 3 Hrs

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

LIST OF EXPERIMENTS

1. Single plane method: Determination of RL of an elevated object using 2 instrument station which are placed in same vertical plane when object is in accessible
2. Two plane method: Determination of R.L of an elevated object using two instrument stations which are not placed in the same vertical plane when base of the object inaccessible
3. Distance between two inaccessible points using principles of trigonometric surveying (Theodolite)
4. Determine the gradient of a line connecting two points using tangential and stadia tacheometry
5. Indirect contour surveying using Tacheometry
6. Introduction to Total Station and Applications-The introduction includes

setting up of Total Station over a station, input values: Measurement of Horizontal & Vertical distance using Total Station

7. Develop the contour map for a given area using Total Station downloading of data into the computer and plotting the map
8. Determination of area enclosed in closed traverse having minimum 5 station. Plot the measured values using a AUTOCADD
9. Setting out works using Total Station – Staking out
10. Geographic Position System (GPS), Geographical Information System (GIS) and their applications: Determination of Latitude and Longitude of any four stations and computation of the area. Check trust worthiness of the measured results.
11. Setting of simple curve by using Total Station
12. Demonstration of Digital micro optic Theodolite.

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

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

DEPARTMENT OF CIVIL ENGINEERING
FLUID MECHANICS LAB

SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week):0 : 0 : 2	SEE Marks:50	Course Code: U21PC431CE
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
<ol style="list-style-type: none">1. Provide practical knowledge in verification of principles of fluid flow2. Impart knowledge in measuring coefficient of discharge for various devices.	<ol style="list-style-type: none">1. Determine coefficient of discharge for various measuring devices such as orifice, venturimeter, mouth piece, notches , weirs and hemispherical vessel and Validate Bernoulli's theorem..2. Calculate Reynolds number and classify types of flows.3. Estimate Darcy's friction factor for turbulent flow in pipes.4. Practise working as a team member and lead a team5. 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. Experimental verification of Water Hammer Phenomenon

7. Determination of types of flows using Reynolds Apparatus
8. Determination of Darcy's coefficient of friction.
9. Verification of Bernoulli's Theorem.
10. Determination of C_d for Orifice Meter
11. Determination of coefficient of sudden contraction (minor losses)

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

**OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN
B.E. IV SEMESTER**

Dept	Title	Code	credits
Civil	Disaster Management	U21OE410CE	3
CSE	Introduction To Data Structures	U21OE410CS	3
CSE	Introduction To Software Engineering	U21OE420CS	3
ECE	Mathematical Programming for Engineers	U21OE410EC	3
ECE	Introduction to Communication Systems	U21OE420EC	3
IT	Introduction to Object Oriented Programming	U21OE410IT	3
IT	Introduction to Scripting Languages	U21OE420IT	3
Mech.	Optimization Methods	U21OE410ME	3
HSS	Critical Thinking	U21OE430EH	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: U21OE410CE
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
<ol style="list-style-type: none">1. Know about the state of art of disaster management in world and explore the history of the disasters and comprehend how past events have helped shape the future.2. Study the various natural and manmade disasters and apply the mitigation measures3. Expose students to various technologies used for disaster mitigation and management.	<ol style="list-style-type: none">1. Attain knowledge on various types, stages, phases in disaster with international & national policies and programmes with reference to the disaster reduction.2. Understand various types of natural disaster, their occurrence, Effects, Mitigation and Management Systems in India3. Understand different types of manmade disasters, their occurrence, Effects, Mitigation and Management Systems in India.4. Explain the utility of geography information systems (GIS), Remote sensing technology in all phases of disaster mitigation and management.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 Test | : 30 |
| 2. No. of Assignments | : 3 | Max. Marks for each Assignment | : 5 |
| 3. No. of Quizzes | : 3 | Max. Marks for each Quiz Test | : 5 |

Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)
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:U210E410CS
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

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

UNIT – I:

Arrays: Arrays - ADT, Polynomials, Sparse matrices,

Linked Lists: Singly Linked Lists, Circularly linked lists, Doubly Linked Lists.

UNIT – II :

Stacks: Array Representation, Linked Representation, Applications. **Queues:** Array Representation, Linked Representation, Applications.

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

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

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

Learning Resources:

1. Horowitz E, Sahni S and Susan Anderson-Freed, Fundamentals of Data structures in C, 2nd Edition(2008), Universities Press
2. Mark A Weiss, Data Structures and Algorithm Analysis In C, Second Edition(2002), Pearson
3. Kushwaha D. S and Misra A.K, Data structures A Programming Approach with C, Second Edition(2014), PHI.,
4. Gilberg R. F and Forouzan B. A, Data structures: A Pseudocode Approachwith C, Second Edition(2007), Cengage Learning
5. Tanenbaum A. M ,Langsam Y. Augenstein M. J, Data Structures using C,Second Edition (2008), Pearson.
6. Thomas H. Cormen, Charles E. Leiserson, Ronald L Rivest, Clifford Stein, Introduction to Algorithms, Third Edition(2009), MIT Press
7. YedidyahLangsam , Moshe J. Augenstein ,Aaron M.Tenenbaum, DataStructures 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

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

Duration of Internal Test: 90 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:U210E420CS
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

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

UNIT-I:

Introduction to Software Engineering:

A generic view of Process: Software Engineering, Process Framework, CMMI, Process Patterns, Process Assessment.

Process Models: Waterfall Model, Incremental Process Models, Evolutionary Process Models, Specialized Process Models, The Unified Process.

An Agile view of Process: What is an Agile Process, Agile Process Models- SCRUM, XP.

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

UNIT-III:

Object oriented Modeling& design using UML: Introduction to UML.

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

UNIT-IV:

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

Architectural Modelling: Artifacts, Artifact diagrams, Deployment diagrams.

UNIT-V:

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

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

Learning Resources:

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, 6th Edition (2005), Tata McGrawHill.
2. Grady Booch, James Rumbaugh, 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.

With effect from the Academic Year 2022-23 (R21)

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

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

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

Duration of Internal Test: 90 minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
MATHEMATICAL PROGRAMMING FOR ENGINEERS
(OPEN ELECTIVE - II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T:P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:U21OE410EC
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 1. Generate arrays and matrices for numerical problems solving. 2. Represent data and solution in graphical display. 3. Write scripts and functions to easily execute series of tasks in problem solving. 4. Use arrays, matrices and functions in Engineering applications 5. Design GUI for basic mathematical applications.

UNIT - I : Introduction:

Basics of MATLAB, MATLAB windows, Advantages of MATLAB, on-line help, file types.

MATLAB Basics: Variables and Constants – Vectors and Matrices- Arrays - manipulation- Built-in MATLAB Functions. Creating and printing simple plots, Creating , Saving and Executing a Script File, Creating and Executing a function file.

Programming Basics: Data types-Operators – Hierarchy of operations, Relational and logical operators, if-end structure, if-else-end structure, if-elseif-else-end structure, switch-case statement, for-end loop, while-end loop, break and continue commands

UNIT - II : Scripts and Functions

Script Files, Function Files, Debugging methods in MATLAB.

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

UNIT - III : Numerical Methods Using MATLAB

Numerical Differentiation, Numerical integration- Newton-Cotes integration formulae, Multi-step application of Trapezoidal rule, Simpson's 1/3 Rule for Numerical Integration. MATLAB functions for integration.

Linear Equations-Linear algebra in MATLAB, Solving a linear system, Gauss Elimination, Finding eigen values and eigen vectors, Matrix factorizations, Advanced topics.

UNIT - IV : Nonlinear Equations

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

UNIT - V :

Solution of Ordinary differential Equations(ODEs)-The 4th order Runge-kutta Method, ODE Solvers in MATLAB, Solving First -order equations using ODE23 and ODE45.

Structures and Graphical user interface(GUI):Advanced data Objects, How a GUI works, Creating and displaying a GUI. GUI components, Dialog Boxes.

Learning Resources:

1. Getting started with MATLAB "A quick introduction for scientist and engineers by RudraPratap, Oxford publications.
2. Advanced Guide to MATLAB-Practical Examples in Science and 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 Siau Alexandre Bayen, Elsevier-18th April 2014.
5. <https://nptel.ac.in/courses/103106118/2>
6. <https://www.udemy.com/numerical-methods/>

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

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

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INTRODUCTION TO COMMUNICATION SYSTEMS
(OPEN ELECTIVE - II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:U21OE420EC
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

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

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

UNIT - III :

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

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

UNIT - IV :

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

UNIT - V :

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

Learning Resources:

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

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

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

Duration of Internal Test: 90 minutes

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

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

SYLLABUS FOR B.E.IV-SEMESTER

L: T: P (Hrs/Week): 3:0:0	SEE Marks: 60	Course Code: U21OE410IT
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

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

UNIT- I

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

Arrays: One-dimensional arrays, creating an array, declaration of arrays, initialization of arrays, two-dimensional arrays.

Packages: Creation, importing a package and user defined package.

Interfaces: Defining interfaces, extending interfaces, implementing interfaces.

UNIT- II

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

UNIT- III

Basic I/O Streams: Java I/O classes and interfaces, Files, Stream and Byte classes, Character Streams, Serialization.

Exploring java.lang: Object, Wrapper classes, String, StringBuffer, System

UNIT- IV

Introducing AWT working with Graphics: AWT Classes, Working with Graphics. Event Handling: The Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces.

Awt Controls: Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, CheckboxGroup, Choice Controls, Using Lists, Managing Scroll Bars, Using TextField, Using TextArea, Understanding Layout Managers, Menu bars and Menus, Dialog Boxes, FileDialog, Exploring the controls, Menus ,and Layout Managers.

UNIT- V

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

Learning Resources:

1. Herbert Schildt, The Complete Reference Java, 7th Edition, TataMcGraw 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 McGrawHill, 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

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- Duration of Internal Test: 90 minutes

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

DEPARTMENT OF INFORMATION TECHNOLOGY
INTRODUCTION TO SCRIPTING LANGUAGES

(Open Elective-II)
(Common for CIVIL, ECE, EEE & MECH)
SYLLABUS FOR B.E.IV-SEMESTER

L: T: P (Hrs/Week): 3:0:0	SEE Marks: 60	Course Code: U21OE420IT
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

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

Unit – I

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

Unit – II

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

Unit – III

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

Unit – IV

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

Unit – V

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

Learning Resources

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

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

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

Duration of Internal Test: 90 minutes

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

DEPARTMENT OF MECHANICAL ENGINEERING

OPTIMIZATION METHODS

(Open Elective-II)

SYLLABUS FOR B.E.IV-SEMESTER

L: T: P (Hrs/Week): 3:0:0	SEE Marks: 60	Course Code: U21OE410ME
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of this course are to:	On completion of the course, students will be able to
understand Linear & non-linear programming, transportation modeling, CPM & PERT for project scheduling and control, and application of various optimization techniques for respective field engineering (Inter disciplinary)	<ol style="list-style-type: none">1. Optimization of resources in multi disciplinary areas through linear programming under different conditions.2. Understand revised simplex methods per customer requirements to suit for various Organizations.3. Minimization of total cost to apply for transportation techniques for the transshipment of Goods and products and Implement techniques like project management4. 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

Special cases in simplex method, Duality in LPP, Differences between primal and dual, shadow prices, Dual simplex method, Revised simplex method.

UNIT-III: Transportation Model

Introduction to 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.

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, Dichotomous search, Interval Halving method, Fibonacci and golden bisection Method, Newton and Quasi Newton method.

UNIT-V: Non Linear - Unconstrained optimization: classification, Univariate search, pattern Directions, Hook Jeeves, Powel method, steepest decent 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.
2. R. Paneerselvam, "Operations Research", PHI Learning Pvt Ltd., 2009.
3. 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

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

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

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:U21OE430EH
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners to: <ol style="list-style-type: none">1. Identify the core skills associated with critical thinking.2. Comprehend the various techniques of critical thinking3. Evaluate data and draw insights from it to make the right decisions4. Understand where to look for bias and assumptions in problem5. Understand structure, standards and ethics of critical writing	At the end of the course the learners will be able to: - <ol style="list-style-type: none">1. Analyse and compare techniques for comparing alternate solutions2. Demonstrate the difference between deductive and inductive reasoning and construct logically sound arguments3. Check for accuracy of data and use it as a tool for problem solving4. Evaluate, identify and distinguish between relevant and irrelevant information to formulate a thesis or hypothesis.5. Employ evidence and information effectively

UNIT I - COMPONENTS OF CRITICAL THINKING

- 1.1 Applying Reason
- 1.2 Open Mindedness
- 1.3 Analysis
- 1.4 Logic

UNIT II - NON-LINEAR THINKING

- 1.1 Step Out of Your Comfort Zone
- 1.2 Don't Jump to Conclusions
- 1.3 Expect and Initiate Change
- 1.4 Being Ready to Adapt

UNIT III - LOGICAL THINKING

- a. Ask the Right Questions
- b. Organize the Data
- c. Evaluate the Information
- d. Draw Conclusions

UNIT IV - INFER MEANING FROM INFORMATIVE TEXTS

- 4.1 Making Assumptions
- 4.2 Watch out for Bias
- 4.3 Ask Clarifying Questions
- 4.4 SWOT Analysis

UNIT-V - PROBLEM SOLVING

- 5.1 Identify Inconsistencies
- 5.2 Trust Your Instincts
- 5.3 Asking Why?

METHODOLOGY:-

Case Studies
Demonstration
Presentations
Expert lectures
Writing and Audio-visual lessons

ASSESSMENT :-

Online assignments
Individual and Group

Learning Resources:

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

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

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| 3. No. of Quizzes | : 3 | Max. Marks for each Quiz Test | : 5 |
- Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-21)
BE (CIVIL ENGINEERING) IV-SEMESTER (BRIDGE COURSE) ACADEMIC YEAR 2022 - 2023
(Students Admitted in 2021-22)

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								
UB21HS2230EH	English Language and Communication Skills	2	-	-	3	50	-	-
UB21BS400MA	Matrix Theory and Vector Calculus	2	-	-	3	50	-	-
UB21HS2231EH	English Language and Communication Skills Lab	-	-	2	3	50	-	-

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

**ENGLISH LANGUAGE COMMUNICATION (Theory)
Bridge Course for Lateral Entry Students**

SYLLABUS FOR B.E. IV-SEMESTER

L: T: P (Hrs/Week) : 2	SEE Marks: 50	UB21HS2230EH
Credits: nil	CIE Marks: - - -	Duration of SEE: Hours : 2

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

UNIT-1 1.0: Communication & Functional English

1.1 Role and Importance of Communication, Process of Communication, Non-verbal communication, barriers to Communication.

Conversational phrases: greetings, introductions, apology, compliments, agreeing and disagreeing, polite forms in everyday conversations.

UNIT 2 2.0: Listening

2.1 Importance of listening, Active listening

Unit 3. 3.0: Writing

1.1 Paragraph writing, coherence and cohesion.

Unit 4 4.0: Grammar and Vocabulary

4.1 Common Errors, one word substitutes, Phrasal-verbs, collocations.

Unit-5 5.0: Reading

5.1 Prose text- On shaking hands

Prescribed textbook for theory:

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

Suggested Reading

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

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MATHEMATICS**

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

SYLLABUS FOR B.E. IV-SEMESTER

L: T: P (Hrs/Week) : 2	SEE Marks: 50	UB21BS400MA
Credits: -	CIE Marks: - - -	Duration of SEE:2

UNIT-I: DIFFERENTIATION & INTEGRATION

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

UNIT – II : VECTOR DIFFERENTIATION

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

UNIT – III : VECTOR INTEGRATION

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

UNIT- IV : MATRIX THEORY

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

Learning Resources:

1. B.S. Grewal, Higher Engineering Mathematics

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCE
ENGLISH LANGUAGE COMMUNICATION SKILLS LAB (ELCS)

Bridge Course for Lateral Entry Students
(Common to all branches)

SYLLABUS FOR B.E. IV-SEMESTER

L: T: P (Hrs/Week) : 2	SEE Marks: 50	Course Code: UB21HS2231EH
Credits: -	CIE Marks: - -	Duration of SEE:3

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

ELCS – Component - INTERACTIVE COMMUNICATION SKILLS LAB

- 1 **Group discussion:** Objectives of GD, Types of GDs; Initiating, Continuing, and concluding a GD.
- 2 **Debate:** Understanding the differences between a debate and a group discussion, essentials of debate, concluding a debate.
- 3 **Public Speaking:** Advantages of public speaking, essentials of an effective speech, types of delivery, rehearsal techniques, planning and delivering a speech.
- 4 **Presentation Skills :** Making effective presentations, using non-verbal communication , coping with stage fright , use of Audio visual aids researching on various topics.

With effect from the Academic Year 2019-20

With effect from the Academic Year 2019-20