

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

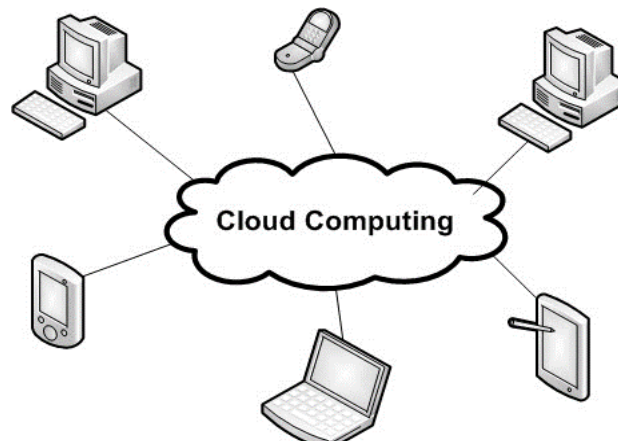
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Affiliated to Osmania University, Hyderabad-07

Sponsored by

**VASAVI ACADEMY OF EDUCATION
Hyderabad**



**SCHEME OF INSTRUCTION AND SYLLABI UNDER CBCS FOR
B.E. (IT) III and IV Semesters with effect from 2020-2021
(For the batch admitted in 2019-20)
(R-19)**



DEPARTMENT OF INFORMATION TECHNOLOGY
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**VASAVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD-500 031**

Vision

Striving for a symbiosis of technological excellence and human values.

Mission

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

Quality Policy

Education without quality is like a flower without fragrance. It is our earnest resolve to strive towards imparting high standards of teaching, training and developing human resources.

DEPARTMENT OF INFORMATION TECHNOLOGY

Vision

To be a centre of excellence in core Information Technology and multidisciplinary learning and research, where students get trained in latest technologies for professional and societal growth.

Mission

To enable the students acquire skills related to latest technologies in IT through practice-oriented teaching and training.



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DEPARTMENT OF INFORMATION TECHNOLOGY

Programme Educational Objectives (PEOs) for IT Program

The Programme will produce graduates

- PEO1. With theoretical and practical knowledge to obtain employment or pursue higher studies and solve problems in Information Technology.
- PEO2. With effective written and oral communication skills that will help them to work in diversified and dynamic working environments.
- PEO3. With competence to succeed in their professional lives with ethical values.

Program Specific Outcomes (PSOs) for IT Program

The Students will demonstrate

- PSO1. Competency in programming using different programming languages to implement algorithms.
- PSO2. Competency in the analysis and design of a software solution using different modelling tools.
- PSO3. Competency in Electronic Design and Embedded System Design using different simulation tools.

Program Outcomes (POs) for IT Program

At the end of the program, the graduates will demonstrate

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.

PROMOTION RULES

1. Attendance and Sessional marks requirements:

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

II. Promotion rules for B.E(4YDC) course

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

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

S No	Semester/Class	Conditions to be fulfilled
1	III-SEM to IV-SEM	a. Regular course of study of III-SEM and
		a. 40% aggregate CIE marks in III-SEM
2	IV-SEM to V-SEM	e. Regular course of study of IV SEM
		f. 40% aggregate CIE marks in IV-SEM
		g. Must have secured at least 50% of total credits prescribed for III and IV SEMs put together
3	V-SEM to VI-SEM	c) Regular course of study V-SEM
		d) 40% aggregate CIE marks in V-SEM
4	VI-SEM to VII-SEM	e. Regular course of study of VI SEM
		f. 40% aggregate CIE marks in VI-SEM
		g. Passed in all the courses of III and IV SEMs
		h. Must have secured at least 50% of total credits prescribed for V and VI SEMs put together
5	VII-SEM to VIII-SEM	c. Regular course of study of VII SEM
		d. 40% aggregate CIE marks in VII SEM
6	Eligibility to appear VIII-SEM exams	b. Regular course of study of VIII SEM and 40% aggregate CIE marks in VIII-SEM

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION (R-19)
B.E. – INFORMATION TECHNOLOGY : THIRD SEMESTER (2020 - 2021)

B.E (IT) III-Semester								
Course Code	Course Name	Scheme of Instruction			Scheme of Examination			
		Hours per week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
U19HS330EH	Skill Development: Communication Skills in English - I	2	-	-	3	60	40	2
U19BS340MA	Discrete Mathematics	3	-	-	3	60	40	3
U19ES310IT	Digital Electronics and Logic Design	3	-	-	3	60	40	3
U19PC310IT	Data Structures	3	-	-	3	60	40	3
U19PC320IT	Object Oriented Programming	3	-	-	3	60	40	3
U19OE3XXXX	Open Elective – I	2	-	-	3	60	40	2
U19MC010CE	Environmental Science	2	-	-	3	60	40	0
U19MC310ME	Introduction to Entrepreneurship	1	-	-	2	40	30	0
PRACTICALS								
U19PC311IT	Data Structures Lab	-	-	2	3	50	30	1
U19PC321IT	Object Oriented Programming Lab	-	-	2	3	50	30	1
U19PW319IT	Mini Project – I	-	-	2	-	-	30	1
Student should acquire one online certification course equivalent to 2 credits during III-VII Semesters.								
Total		19	-	6	--	560	400	19
Grand Total		25			--	960		
<i>Note:</i>								
1. One hour is allotted to Library / Sports / Mentor Interaction.								
2. The left over hours are to be allotted to ECA-I / CCA-I / RC / CC / TC based on the requirement .								

VASAVI COLLEGE OF ENGINEERING
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 IBRAHIMBAGH, HYDERABAD – 500 031
Department of Humanities and Social Sciences
Skill Development: Communication Skills in English - I
 SKILL DEVELOPMENT COURSE: I
 FOR BE 2/4-III SEMESTER (COMMON FOR ALL BRANCHES)

L : T : P (Hrs/Week) : 2 hours	SEE Marks : 60	Course Code: UI9HS330EH
Credits: 2	CIE Marks : 40	Duration of SEE : Hours : 03

Course Overview:

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

Course Objective:

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

Overview of the delivery Methodology:

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

Unit1 – Fundamentals of Communication**Unit Overview:**

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

Learning Outcome:

The students should be able to:

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

Competencies:

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

Sessions:

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

Unit 2 - Narrations and Dialogues**Unit Overview:**

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

Learning Outcome:

The students should be able to

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

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

Competencies:

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

Sessions:

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

Unit 3 - Rational Recap

Unit Overview:

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

Learning Outcome:

The students should be able to:

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

Competencies:

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

Sessions:

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

Unit 4: Technical Expositions and Discussions

Unit Overview:

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

Learning Outcome:

The students should be able to:

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

Competencies:

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

Sessions:

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

Unit 5: Drawing Conclusions

Unit Overview:

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

Learning Outcome:

Students should be able to:

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

Competencies:

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

Sessions:

1. Reasoning
2. Analyzing
3. Generalization and Prediction

Students are given workbooks prepared by Talent sprint.

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal 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		

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DEPARTMENT OF MATHEMATICS

DISCRETE MATHEMATICS
SYLLABUS FOR B.E. III-SEMESTER
(For IT Only)

L:T: P(Hrs/week):3:0:0	SEE Marks: 60	Course Code : U19BS340MA
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 Propositions and their equivalences, predicates and quantifiers and learn various proof strategies. 2. Study the concepts of number theory such Modular Arithmetic, Congruences and basic cryptography etc., 3. Understand the basics of counting, combinatory, and various methods of solving Recurrence relations. 4. Understand Relations, Equivalence relations, Posets and Hasse diagrams. 5. Analyze the concepts of Graphs. 	<ol style="list-style-type: none"> 1. Use logical notation to define and reason about fundamental mathematical concepts and synthesize induction hypothesis and simple Induction proofs. 2. Prove elementary properties of modular arithmetic and basic cryptography and apply in Computer Science. 3. Calculate number of possible outcomes of elementary combinatorial processes such as permutations and combinations Model and analyze computational processes using analytic and Combinatorial methods. 4. Prove whether a given relation is an equivalence relation/poset and will be able to draw a Hasse diagram.

UNIT-I:

Logic: Logic- Logical connectives- Propositional equivalences– Predicates and quantifiers – Nested quantifiers.

Mathematical Reasoning, Induction: Proof Strategy- Methods of Proofs- Mathematical Induction- Second Principle of Mathematical Induction.

UNIT-II

Number Theory: The Integers and Division- Division Algorithm- Fundamental Theorem of Arithmetic –Modular Arithmetic-Integers and Algorithms- Euclidean Algorithm. Applications of Number Theory-Linear Congruences- The Chinese Remainder Theorem (without Proof)- Fermat’s Little Theorem- Public key cryptography- RSA Encryption and Decryption.

UNIT-III:

Counting: Basics of counting- Pigeonhole principle- Permutations and combinations – Pascal’s Identity- Vandermonde’s Identity- Generalized Permutations and combinations.

Advanced Counting Techniques: Recurrence relations: Solving Recurrence Relations- Linear Homogeneous and Non-Homogeneous Recurrence relations.

UNIT-IV:

Relations: Relations – Properties -Representing relations - Equivalence Relations - Partial Orderings- Poset- Hasse diagrams – Maximal & Minimal Elements.

UNIT-V:

Graph Theory: Introduction- Types of graphs- Graph terminology- Basic theorems- Representing Graphs and Graph Isomorphism - Connectivity- Euler and Hamiltonian paths - Planar graphs- Euler’s Formula- Graph coloring- Basic Definitions.

Learning Resources:

1. Kenneth H.Rosen – Discrete Mathematics and its application – 5th edition, Mc Graw – Hill, 2003.
2. Joel. Mott. Abraham Kandel, T.P.Baker, Discrete Mathematics for Computer Scientist & Mathematicans, Prentice Hall N.J., 2nd edn, 1986.
3. Discrete and Combinatorial Mathematics by Ralph P. Grimaldi , Pearson International
4. J.P.Trembly, R.Manohar, Discrete Mathematical Structure with Application to Computer Science, Mc Graw- Hill – 1997.
5. R.K. Bisht, H.S.Dhami - Discrete Mathematics, Oxford University Press, 2015.
6. <http://mathworld.wolfram.com/topics>
7. <http://www.nptel.ac.in/course.php>

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal 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			

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DEPARTMENT OF INFORMATION TECHNOLOGY

DIGITAL ELECTRONICS AND LOGIC DESIGN
 SYLLABUS FOR III-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code : U19ES310IT
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>
The Course will enable the students to design combinational and sequential circuits.	<ol style="list-style-type: none"> 1. Simplify Boolean Functions using algebraic and K-map techniques to specific number of literals. 2. Design combinational circuits using fundamental logic gates and programmable logic devices for a given problem. 3. Draw the circuits of different types of flipflops and explain their operation using Truth tables and excitation tables. 4. Analyze any given synchronous or asynchronous sequential circuit and design synchronous or asynchronous sequential circuits for a given specification of the problem. 5. Implement combinational and sequential circuits using VHDL programming language.

UNIT – I:

Introduction to Boolean algebra and number system, Logic Gates, Optimized implementation of logic functions – Karnaugh Map, Strategies for minimization of product-of-sum and sum-of-product functions. Multiple output circuits. NAND and NOR logic networks, Cost functions, Introduction to CAD tools and VHDL

UNIT – II:

Combinational circuit building blocks – Multiplexers. Decoders. Encoders. Code converters, Arithmetic comparison circuits. General structures of a PLA, gate level diagram, schematic diagram, PAL. Structure of CPLDs and FPGAs, 2-input and 3-input lookup tables(LUT). Design of Arithmetic-circuits using CAD tools. VHDL for Combinational circuits

UNIT – III:

Basic Latch, Gated SR Latch, gated D Latch, T Flip-flop, JK Flip-flop, excitation tables. Master-Slave edge triggered flip-flops. Set up and hold time of a flip-flop. Registers, Counter. Using registers and counters with CAD tools. Design examples using VHDL.

UNIT – IV:

Synchronous Sequential Circuits – Analysis of Synchronous sequential Circuits Basic design steps. State-Assignment problem Moore and Mealy state models. State minimization, Design of FSM with CAD Tools. Implementation using VHDL.

UNIT – V:

Introduction to Asynchronous sequential circuits, Analysis of Asynchronous sequential circuits. Hazards: static and dynamic hazards. Significance of Hazards. Clock skew, ASM Charts, Digital Hardware Design Flow.

Learning Resources :

1. M. Moris Mano, Charles R. Kime, Logic and Computer Design Fundamentals, 2nd edition, Pearson Education Asia, 2001.
2. Stephen Brown , Zvonko Vranesic – Fundamentals of Digital Logic with VHDL design, McGraw Hill – 2000.
3. Virendrakumar Digital Electronics Theory & Experiments, New Age International Publishers, 2002
4. John F. Walkerly, Digital Design : Principles and Practices, Pearson India, 4th Edition.
5. Ronald J. Tocci, Neal S. Widmer, Gregory L. Moss, Digital Systems: Principles and Applications, Pearson India, 10th Edition.
6. <https://nptel.ac.in/courses/117106086/>

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			

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DEPARTMENT OF INFORMATION TECHNOLOGY

DATA STRUCTURES
SYLLABUS FOR III-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code : U19PC310IT
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

Course Objectives	Course Outcomes
The Objectives of the course:	At the end of the course student will be able to:
1. Demonstrate linear and non-linear data structures and their applications. 2. Illustrate searching and sorting techniques.	1. Understand asymptotic notations, operations on arrays and stacks, and evaluate arithmetic expressions. 2. Analyze search, insert and delete operations on queues and linked list. 3. Compare complexities of insertion, deletion and search operations on trees, binary search trees and balanced binary search trees. 4. Understand the operations on multiway search trees and apply graph search algorithms to find minimal cost Spanning trees. 5. Evaluate the complexities of sorting, searching and hashing techniques.

UNIT-I:

Basic Concepts: Elementary Data Organizations, Data Abstraction. Data Structures Introduction and Operations: insertion, deletion, traversal. Performance analysis - time complexity and space complexity, Asymptotic Notations- Big O, Omega and Theta notations.

Stacks: Stack Abstract Data Type, Representation of a Stack using Arrays –Implementation of Stack Operations - Stack Applications: Infix to postfix Transformation - Evaluating Arithmetic Expressions.

UNIT-II:

Queues: Queue Abstract Data Type- Representation of a Queue using array - Implementation of Queue Operations - Applications of Queues - Circular Queues.

Linked List: Introduction – Singly Linked list -Operations on a singly linked list -Dynamically Linked Stacks and Queues

Doubly linked list-Operations on a doubly linked list, Circular Linked list, Polynomial manipulation - Operations, Sparse Matrices.

UNIT-III:

Trees: Introduction, Binary Trees, Binary Tree Traversals, Heaps.

Binary Search trees (BST) : Definition, Searching a BST, Insertion into a BST, Deletion from a BST.

Efficient Binary Search Trees: AVL Trees, Red-Black Trees, Splay Trees.

UNIT-IV:

Multiway Search Trees: m-way search trees-Definition and Properties, Searching an m-way search tree, B-Trees-Definition and properties, Number of Elements in a B-Tree, Insertion into a B-Tree and Deletion from a B-Tree.

Graphs: The Graph ADT, Elementary graph operations - Depth First Search (DFS), Breadth First Search (BFS), Minimum Cost Spanning Trees- Kruskal's Algorithm, Prim's Algorithm.

UNIT-V:

Sorting and complexity analysis: Insertion Sort, Heap sort.

Searching: Linear Search, Binary Search Techniques and their complexity analysis.

Hashing : Introduction, Static Hashing – Hash tables, Hash functions, Overflow handling.

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 C, Second Edition (2002), Pearson
3. Richard F, Gilberg, B.A. Forouzan, "Data Structures, A Pseudocode Approach with C", Cengage, 2nd Edition
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stem 'Introduction to Algorithms' 2002.
5. Tanenbaum A. M , Langsam Y. Augenstein M. J, Data Structures using C, Second Edition (2008), Pearson
6. Data Structures through C in depth,S K Srivastava,Deepali Srivastava,BPB publications,2nd Edition

Online Resources:

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

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			

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DEPARTMENT OF INFORMATION TECHNOLOGY

OBJECT ORIENTED PROGRAMMING
 SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : U19PC320IT
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVE	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
1. Provide an overview of object-oriented programming concepts. 2. Explore java libraries to build applications.	1. Illustrate object-oriented programming features using Java. 2. Perform exception handling and multithreading. 3. Perform I/O operations, String manipulation using java libraries. 4. Implement data structures using collections framework. 5. Design and develop GUI using java libraries.

UNIT-I: Object Oriented Programming Fundamentals :

Object, Class, Abstraction, Encapsulation, Inheritance, Polymorphism.

Java Programming Fundamentals: Overview of Java , Java-keywords, Data types, Variables, Arrays, Command Line Arguments, Operators, Control statements, Structure of a Java class, Classes, Methods, Abstract Classes, Nested Classes. **Interfaces :** Defining interfaces, extending interfaces, implementing interfaces. **Packages:** Creation, importing a package and user defined package.

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

Multithreaded Programming: Introduction to threads, creating threads, extending the Thread class, implementing the Runnable interface, life cycle of a thread, priority of a thread, synchronization, and Inter-thread Communication.

UNIT-III: Exploring java.io : Java I/O classes and interfaces, Files, Character and Byte Streams Serialization.

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

Exploring java.util: Scanner, StringTokenizer, Date, Calendar.

UNIT-IV: Introduction to Generics: Defining Generics, Generics and Subtyping, Wildcards, Generic Methods.

Introduction to Collections: Collection Framework, Benefits of Collections Framework, Collection Framework Interfaces : Collection , Set, List, Queue, Deque, Sorted Set, Map, Sorted Map. Collection Framework Implementations : HashSet, TreeSet, ArrayList, LinkedList, PriorityQueue, ArrayDeque, HashMap, TreeMap. Traversing Collections. Collection Framework Algorithms : Sorting, Searching.

UNIT-V: GUI Programming : Introduction to Abstract Window Toolkit(AWT), Swing and Applets : AWT Class Hierarchy, Swing Class Hierarchy, Swing Components, Containers, Layout Managers, Event Handling : The Delegation Event Model, Model View Controller Architecture, Modifying Look and Feel, Working with Graphics and Applets.

Learning Resources:

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

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

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

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

ENVIRONMENTAL SCIENCE
 SYLLABUS FOR B.E. IV-SEMESTER

L : T : P (Hrs./week): 2 : 0 : 0	SEE Marks:60	Course Code: U19MC010CE
Credits : - - -	CIE Marks:40	Duration of SEE: 3 Hrs

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

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

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

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

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

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

Learning Resources:

- Deswal S. and Deswal A., A Basic Course on Environmental studies, Dhanpat Rai & Co Pvt. Ltd. 2013.
- Benny Joseph, Environmental Studies, Tata McGraw-Hill, 2006.
- Suresh K. Dhameja, Environmental Studies, S.K. Kataria & Sons, 2010.
- De A.K., Environmental Chemistry, New Age International, 2003.
- Odum E.P., Fundamentals of Ecology, W.B. Saunders Co., USA, 2004.
- Sharma V.K., Disaster Management, National Centre for Disaster Management, IPE, Delhi, 2013.
- Rajagopalan R., Environmental Studies, Second Edition, Oxford University Press, 2013.

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

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

Duration of Internal Tests : 90 Minutes

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

INTRODUCTION TO ENTREPRENEURSHIP
 SYLLABUS FOR BE III SEMESTER

L:T:P (Hrs./week):1:0:0	SEE Marks:40	Course Code: U19MC310ME
Credits : 0	CIE Marks:30	Duration of SEE: 2 Hrs

Course Objectives	Course Outcomes
	On completion of the course, the student will be able to:
The objectives of this course is to inspire students develop an entrepreneurial mind-set, educate about the resources and schemes available to start enterprises in India.	1. Demonstrate awareness about entrepreneurship and potentially be an entrepreneur. 2. Generate and analyse the business ideas. 3. Know about the supporting organizations available to establish the business in the country. 4. Prepare a business plan.

Unit-I: Introduction to Entrepreneurship: Entrepreneurial characteristics, classification of enterprises, forms of business organizations, role of entrepreneurship in economic development, start-ups.

Idea Generation and Opportunity Assessment: Ideas in entrepreneurship, sources of new ideas, techniques for generating ideas, opportunity recognition, steps in tapping opportunities.

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

Entrepreneurial skills, design thinking, selling and communication, project formulation and appraisal, preparation of project report, guidelines for report preparation, pitching of a potential venture.

Learning Resources:

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

Web Resources:

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

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

1	No. of Internal Tests:	01	Max.Marks for each Internal Test:	20
2	No. of Assignments:	01	Max. Marks for each Assignment:	05
3	No. of Quizzes:	01	Max. Marks for each Quiz Test:	05

Duration of Internal Test: **1 Hour**

VASAVI COLLEGE OF ENGINEERING
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 IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF INFORMATION TECHNOLOGY

DATA STRUCTURES LAB
 SYLLABUS FOR B.E. III-SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks : 50	Course Code : U19PC311IT
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
Design and implement abstractions of various data structures and their practical applications.	1. Perform operations on various 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 operations on AVL Tree.
12. Implementation of Breadth First search Traversal on Graphs.
13. Implementation of Depth First search Traversal on Graphs.
14. Implementation of Heap 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 C, Second Edition (2002), Pearson
3. Richard F, Gilberg, B.A. Forouzan, "Data Structures, A Pseudocode Approach with C", Cengage, 2nd Edition
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stem 'Introduction to Algorithms' 2002.
5. Tanenbaum A. M , Langsam Y. Augenstein M. J, Data Structures using C, Second Edition (2008), Pearson
6. Data Structures through C in depth,S K Srivastava,Deepali Srivastava,BPB publications,2nd Edition

Online Resources:

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

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2Hours			

VASAVI COLLEGE OF ENGINEERING
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DEPARTMENT OF INFORMATION TECHNOLOGY

OBJECT ORIENTED PROGRAMMING LAB
SYLLABUS FOR B.E. III-SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks : 50	Course Code : U19PC321IT
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVE	COURSE OUTCOMES
The course will enable the students to	<i>On completion of the course, students will be able to</i>
1. Illustrate the key features of Object-Oriented Programming, threads and files. 2. Demonstrate command line as well as graphical user interface applications.	1. Implement object-oriented programming features using Java. 2. Implement exception handling and multithreading. 3. Execute I/O and String manipulation operations using java libraries. 4. Implement data structures using collections framework. 5. Develop GUI using java libraries.

JAVA API (java.lang package)

1. A program to illustrate the concept of arrays in Java.
2. A program to demonstrate the use of command line arguments.
3. A program to illustrate the concept of inheritance.
4. A program to illustrate the concept of dynamic polymorphism.
5. A program to illustrate the concept of abstract class.
6. A program to demonstrate various access specifiers and their scope using packages.
7. A program to demonstrate how multiple inheritance is achieved using interfaces.
8. A program to demonstrate exception handling by using throw, finally & multiple catch statements.
9. A program to illustrate the concept of user-defined exception.
10. A program to create multiple threads using Thread class and Runnable interface.
11. A program to illustrate the concept of thread synchronization.

JAVA API (java.io package)

- 12.a) A program to illustrate the use of FileInputStream and FileOutputStream
- b) A program to illustrate the use of BufferedInputStream and BufferedOutputStream.
- c) A program to illustrate the use of ObjectInputStream and ObjectOutputStream.

JAVA API (java.util package)

- 13.a) A program to demonstrate the use of Scanner class to read user input.
- b) A program to demonstrate the use of StringTokenizer.
- c) A program to demonstrate the use of Date and Calendar.

14. A program to demonstrate the use of Collection framework classes and algorithms.

JAVA API (java.awt , java.awt.event and , javax.swing package)

15. a) An application involving GUI with different controls using AWT.
b) An application involving GUI with different controls using Swing.
c) An application using Applet.

Learning Resources:

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

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Day-to-day laboratory class work which will be awarded based on the average of assessment for each experiment considering at the end of the course			18
Duration of Internal Test:	2 Hours		

MINI PROJECT-I

L:T:P(Hrs./week):0:0:2	SEE Marks : --	Course Code : U19PW319IT
Credits : 1	CIE Marks : 30	Duration of SEE : -

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
Develop and implement a project using any of the programming languages/simulation tools/electronic components.	<ol style="list-style-type: none"> 1. Apply theoretical knowledge to design solutions for real life problems. 2. Demonstrate the ability to locate and use technical information from multiple sources. 3. Develop team spirit and demonstrate an understanding of professional ethics. 4. Demonstrate the ability to communicate effectively in speech and in writing. 5. Develop the capability for lifelong learning through advanced technology.

1. During the implementation of the projects, Personnel Software Process (PSP) has to be followed.
2. Two reviews will be conducted.
3. Report of the project work has to be submitted for evaluation.

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

Dept	Title	Code	credits
Civil	Green Buildings	U19OE310CE	2
CSE	Fundamentals of Scripting language	U19OE310CS	2
	Cyber Security	U19OE320CS	2
ECE	Introduction to Signals & Systems	U19OE310EC	2
	Basics of Electronic Communication	U19OE320EC	2
	Python Programming	U19OE330EC	2
EEE	Non Conventional Energy Sources	U19OE310EE	2
Mech.	Geometric Modelling	U19OE310ME	2
	Mechanical Technology	U19OE320ME	2
	Basic Heat Transfer for Electronic Systems	U19OE330ME	2
IT	Fundamentals of Data Structures	U19OE310IT	2
	Introduction to Linux	U19OE320IT	2
Maths.	Linear Algebra and its Applications	U19OE310MA	2
Chemistry	Battery science and Technology	U19OE310CH	2
	Corrosion science and it's application	U19OE320CH	2
Physics	Smart Materials & Applications	U19OE310PH	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: U19OE310CE
Credits : 2	CIE Marks:40	Duration of SEE: 3 Hrs

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

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

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

UNIT-III: Green Building Technologies: Introduction- Necessity - Concept of Green building. Principles of green building – Selection of site and Orientation of the building – usage of low energy materials – effective cooling and heating systems – effective electrical systems – effective water conservation systems

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

Learning Resources:

1. Kumara Swamy N.Kameswara Rao A., Building Planning And Drawing, Charotar, Publications, 2013.
2. Shahane, V. S, "Planning and Designing Building", Poona, Allies Book Stall, 2004.
3. Michael Bauer, Peter Mösele 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 :U190E310CS
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

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

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

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

Iteration: while statement

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

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

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

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

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

Learning Resources:

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

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

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

Duration of Internal Tests : 90 Minutes

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
CYBER SECURITY (OPEN ELECTIVE-I)
(Common for CIVIL, ECE, EEE & MECH)

SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks : 60	Course Code :U190E320CS
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

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

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

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

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

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

Learning Resources:

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

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

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

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
 IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INTRODUCTION TO SIGNALS & SYSTEMS
 (OPEN ELECTIVE)
 SYLLABUS FOR B.E. III – SEMESTER (for CSE & IT)

L:T:P (Hrs./week) : 2:0:0	SEE Marks : 60	Course Code: U19OE310EC
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

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

UNIT - I

Continuous time signals: types of signals, representation of signals, basic elementary signals, operations on signals.

Continuous time systems: classification of systems - static and dynamic, linear and non linear, time invariant and time variant.

UNIT - II

Continuous time Fourier transforms: Introduction, existence, properties, magnitude and phase spectrums.

Laplace transforms: Introduction, existence, Laplace transform of basic elementary signals, properties, inverse Laplace transforms

UNIT - III

Discrete time signals: types of signals, representation of signals, basic elementary signals, operations on signals.

Discrete time systems: classification of systems - static and dynamic, linear and non linear, time invariant and time variant.

UNIT - IV

LTI Systems: Introduction to continuous and discrete time LTI systems, properties, impulse response, convolution, causality, stability, transfer function.

Z-transform: Introduction, existence, Z-transform of basic elementary signals, properties, inverse Z-transforms.

Applications: Basic network Analysis, Servo Motor

Learning Resources:

1. P. Ramakrishna Rao, Signals and Systems, McGraw Hill, 2008.
2. Alan V. Oppenheim, Alan S. Wilsky and S. Hamid Nawab, Signals and Systems, 2nd ed., PHI, 2009.
3. Nagoor kani, Signals and Systems McGraw Hill, 2013
4. https://onlinecourses.nptel.ac.in/noc19_ee07/preview
(Principle of Signals and Systems by Prof. Aditya K Jagannatham)
5. <https://www.edx.org/course/signals-and-systems-part-1-1>
6. <https://www.edx.org/course/signals-systems-part-2-iitbombayx-ee210-2x-3>

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

1. No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Tests	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="2"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="2"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Tests: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
BASICS OF ELECTRONIC COMMUNICATION
 (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: U19OE320EC
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

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

UNIT - I

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

UNIT – II

Angle Modulation: Angle Modulation fundamentals, Frequency Modulation – Modulation index and sidebands, Narrowband FM, Wideband FM, Principles of Phase Modulation, Frequency Modulation verses Amplitude Modulation, Applications of FM.

UNIT – III

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

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

UNIT – IV

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

Learning Resources :

- 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

1. No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Tests	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="2"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="2"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Tests: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
PYTHON PROGRAMMING (OPEN ELECTIVE)
SYLLABUS FOR B.E. III – SEMESTER (for CSE)

L:T:P (Hrs./week) : 2:0:0	SEE Marks : 60	Course Code: U19OE330EC
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Acquire problem solving skills 2. Write programs using Python language	<i>On completion of the course, students will be able to</i> 1. Develop Python programs with conditional statements and loops. 2. Write programs using functions, strings and lists. 3. Construct Python data structures programs using tuples, dictionaries and set. 4. Develop programs using files and Object oriented programming .

UNIT - I

Basics of Python Programming: Features of Python, variables and identifiers, operators and expressions.

Decision control Statements: Selection/Conditional branching statements, basic loop structures/iterative Statements, nested loops, break, continue, and pass Statements.

Functions and Modules: function definition, function call, more on defining functions, recursive functions, modules.

UNIT - II

Data Structures: Strings : Introduction, built-in string methods and functions, slice operation, String Module. Regular Expressions.

Lists : Introduction, nested list, cloning lists, basic list operations, list methods. Functional programming-filter(),map(),reduce() function.

UNIT - III

Tuples : Introduction, basic tuple operations, tuple assignment, tuples for returning multiple values, nested tuples, tuple methods and functions.

Set: Introduction, Set operations.

Dictionaries : Basic operations, sorting items, looping over dictionary, nested dictionaries, built-in dictionary functions.

UNIT - IV

Files and Exceptions: reading and writing files, pickling, handling exceptions. Built-in and user-defined exceptions.

OOPS Concepts: Introduction, classes and object, class method and self argument, the __init__()method, class variables and object variables, public and private data members, Inheritance, Operator Overloading.

Learning Resources:

1. Reema Thareja , "Python programming using problem solving approach ", Oxford university press.
2. Allen Downey, " Think Python: How to Think Like a Computer Scientist", O'Reilly publications, 2nd Edition.
3. Albert Lukaszewski, "Mysql for python ", PACKT publishers
4. Mark Lutz , "Learning Python", O'Reilly Publications.
5. Stewart Venit and Elizabeth Drake, Prelude to Programming: Concepts and Design, 6th Edition(2015), Pearson India
6. Mark J Guzdial, Introduction to Computing and programming in Python, 3rd Edition(2013), Pearson India
7. <http://nptel.ac.in/courses/117106113/34>
8. <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-01sc-introduction-to-electrical-engineering-and-computer-science-i-spring-2011/python-tutorial/>
9. www.scipy-lectures.org/intro/language/python_language.html

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

1. No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Tests	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="2"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="2"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Tests: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Non Conventional Energy Sources
 Open Elective-I
 SYLLABUS FOR B.E. III SEMESTER

L: T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:U19OE310EE
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.	1. Demonstrate the generation of electricity from various Non-Conventional sources of energy and solar power generation 2. Illustrate the generation of energy from wind and generation of energy from waste 3. Demonstrate the generation of energy by biomass and fuel cells 4. Illustrate the ocean and geo thermal energy generation

UNIT-I: Introduction and Solar Energy:

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

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

UNIT-II: Wind Energy and Waste to Energy:

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

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

UNIT-II: 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	:	<input type="text" value="2"/>	Max. Marks for each Internal Test	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Tests :90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Mechanical Engineering**GEOMETRIC MODELLING (Open Elective-I)**

SYLLABUS FOR B.E.III-SEMESTER

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: U19OE310ME
Credits :02	CIE Marks:40	Duration of SEE:03Hours

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

UNIT-I: INTRODUCTION TO CAD

product life cycle, conventional design and computer aided design.

Wire Frame Modelling: wire frame entities and their definitions. Interpolation and approximation of curves. Concept of parametric and non-parametric representation of circle and helix curves, demonstration of 2D geometry through CAD software.

UNIT-II: SYNTHETIC CURVES

Parametric representation of cubic spline, Bezier and B-spline curves, continuity, properties and characteristics of splines. Concepts of NURBS, synthetic curves demonstration.

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

UNIT-III: SURFACE MODELING

Analytical surfaces: Definitions of planar, surface of revolution, Tabulated cylinder. Synthetic surfaces: Cubic and Bezier surfaces, visualization of different surfaces.

UNIT-IV: SOLID MODELLING

C-rep and B-rep and feature instancing, Octree encoding, spatial enumeration, cell decomposition, sweeping approaches. Euler's representation of solid models, creation of solid model in CAD software.

ASSEMBLY MODELING: Assembly constraints, assembly tree, top down assembly, bottom up assembly, development of a history tree for a simple assembly, demonstration of simple assembly.

Learning Resources:

1. Ibrahim Zeid, "CAD/CAM- Theory and Practice", McGraw-Hill Inc. New York, 2011.
2. Steven Harrington, "Computer graphics: a programming approach", McGraw-Hill, 1987.
3. David Rogers, J. Alan Adams, "Mathematical elements for computer graphics", McGraw Hill, 1990.
4. McConnell, J. J. "Computer graphics theory into practice", Jones and Bartlett Publishers, 2006.

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

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

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

Department of Mechanical Engineering

MECHANICAL TECHNOLOGY (Open Elective-I)
SYLLABUS FOR B.E.III-SEMESTER

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: U19OE320ME
Credits :02	CIE Marks:40	Duration of SEE:03Hours

COURSE OBJECTIVE	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
The objective of this course is to learn the basic principles of excavating equipment, conveying equipment hoisting equipment, concrete producing equipment and pneumatic equipment.	<ol style="list-style-type: none"> 1 identify the operations of various earth moving equipments for maintenance and selection with respect to their applications. 2 justify various conveying equipment for transporting material based on working principles. 3 Explain the working principles of various types of hoisting equipment in civil engineering applications. 4 examine various aggregate and concrete producing equipments used in concrete production and working of pneumatic equipment.

UNIT-I: EXCAVATING EQUIPMENT

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

UNIT-II: CONVEYING EQUIPMENT

Belt conveyor, Screw Conveyor, Bucket Conveyor, Apron Conveyor and Aerial Ropeway.

UNIT-III: HOISTING EQUIPMENT

Hoist winch, Differential and Worm geared chain hoists, Fork lift trucks, Guyed and stiffly derricks, swing and non-swing mobile crane, whirler crane, Construction elevator, passenger lift and Bucket elevators.

UNIT-IV:

AGGREGATE AND CONCRETE PRODUCING EQUIPMENT

Crushers – Jaw, Gyratory, Hammer and Roll Crushers, Screens – Stationary, Shaking and Vibrating screens. Concrete mixers and Concrete pumps.

Pneumatic Equipment: Reciprocating air– compressor, construction pneumatic tools; jack hammer, paving breaker, Rock drill, concrete vibrator.

Learning Resources:

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

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

1	No. of Internal Tests:	02	Max.Marks for each Internal Test:	30
2	No. of Assignments:	02	Max. Marks for each Assignment:	05
3	No. of Quizzes:	02	Max. Marks for each Quiz Test:	05
Duration of Internal Test: 1 Hour 30 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: U19OE330ME
Credits :02	CIE Marks:40	Duration of SEE:03Hours

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

UNIT-I: INTRODUCTION TO THERMODYNAMICS

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

UNIT-II: SECOND LAW OF THERMODYNAMICS

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

UNIT-III: HEAT TRANSFER

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

UNIT-IV: INTRODUCTION TO COOLING OF ELECTRONIC EQUIPMENT

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

Learning Resources:

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

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

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

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

FUNDAMENTALS OF DATA STRUCTURES
 (Open Elective-I)
 SYLLABUS FOR III-SEMESTER
 (for other Branches)

L:T:P(Hrs./week): 2:0:0	SEE Marks : 60	Course Code :U19OE310IT
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
Explore efficient storage mechanisms for easy access, design and implementation of various data structures.	1. Identify appropriate linear data structure to solve a problem. 2. Illustrate the usage of linked lists for various applications 3. Demonstrate the usage of non-linear data structures – graphs & trees

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

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

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

Duration of Internal Tests : 90 Minutes

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

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

L:T:P(Hrs./week): 2:0:0	SEE Marks :60	Course Code : U19OE320IT
Credits : 2	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
Acquire basic skills for using Linux operating system.	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 Linux Desktop and Managing files. Understanding Linux file system, listing files and directory attributes, Making files and directories, Listing and changing permissions and ownership.

UNIT – II:

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

UNIT – III:

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

UNIT – IV:

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

Learning resources:

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

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

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

Duration of Internal Tests : 90 Minutes

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

LINEAR ALGEBRA AND ITS APPLICATIONS
(OPEN ELECTIVE-I for all branches of 2/4 B.E...)

L:T:P (Hrs./week):2:0:0	SEE Marks :60	Course Code: U190E310MA
Credits : 2	CIE Marks: 40	Duration of SEE: 3 Hrs

UNIT – I (8 classes)

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

UNIT – II (6 classes)

Linear Transformation -I

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

UNIT – III (6 classes)

Linear Transformation -II

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

UNIT – IV (8 classes)

Inner Product Spaces-The Dot Product on R and Inner Product Spaces, Orthonormal Bases, Orthogonal Complements, Application: Least Squares Approximation

Learning Resources:

1. An Introduction to Linear Algebra, V.Krishna Murthy, V.P Mainra, J.L Arora, Affiliated to East-West Press Pvt Ltd

Reference Books:

2. Introduction to Linear Algebra with Application, Author : Jim DeFranza, Daniel Gagliardi, Publisher : Tata McGraw-Hill
3. Elementary Linear Algebra, Author : Anton and Rorres, Publisher : Wiley India Edition.
4. Advanced Engineering Mathematics, Author : Erwin Kreysig, Publisher : Wiley Publication
5. Elementary Linear Algebra, Author : Ron Larson, Publisher : Cengage Learning

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

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

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

Open Elective: BATTERY SCIENCE AND TECHNOLOGY
SYLLABUS FOR B.E. III-SEMESTER

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: U19OE310CH
Credits :02	CIE Marks:40	Duration of SEE:03Hours

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

UNIT-I: BATTERIES- FUNDAMENTALS

Introduction and types of batteries: Primary and secondary.

Battery characteristics: Free energy change, electromotive force of battery, ampere-hour, capacity, power, power density, energy density, efficiency, cycle life, tolerance to service conditions, performance characteristics.

UNIT-II: PRIMARY BATTERIES

Construction, chemistry and technology of Zinc-Air Battery, Zinc –HgO battery and their applications.

Primary lithium batteries: Soluble cathode cells, solid cathode cells- Lithium manganese dioxide, solid electrolyte cells- Lithium polymer electrolyte battery- Applications. Reserve battery- Electrochemistry of perchloric acid cell-applications.

UNIT-III: SECONDARY BATTERIES

Construction, chemistry and technology of maintenance free lead acid battery (MFLA), valve regulated lead acid battery (VRLA), absorbed glass mat lead acid battery (AGMLA) - 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).

Books:

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

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

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

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
 IBRAHIMBAGH, HYDERABAD – 500 031
 DEPARTMENT OF CHEMISTRY
Open Elective: CORROSION SCIENCE AND IT'S APPLICATIONS
 SYLLABUS FOR B.E. III-SEMESTER

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: U19OE320CH
Credits :02	CIE Marks:40	Duration of SEE:03Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are	Upon the completion of this course students will be able to
1. To acquaint with the causes and factors influencing the rate of corrosion. 2. To understand the different types of corrosion like dry, wet and galvanic corrosion and their relative impact. 3. To familiarize with few preventive methods of corrosion. 4. To know various industrial methods like electroplating, electroless plating.	1.Explain different types of corrosion with suitable examples. 2.Discuss different factors that affect corrosion and passivation of metals. 3.Select a suitable metallic coating, organic coating and inhibitors for corrosion control of the equipment in a given application. 4.Discuss the principles and applications of cathodic protection and surface conversion coatings for corrosion control. 5.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

- Nature of metal: Relative position of metal in galvanic series, over voltage, relative areas of anode and cathode and nature of corrosion product.
- 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, electro plating 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 electroless plating.

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.

Books:

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

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

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

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

SMART MATERIALS AND APPLICATIONS
Open Elective Course

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

Course Objectives	Course Outcomes
<p><i>The student will be able to</i></p> <ol style="list-style-type: none"> 1. grasp the concepts of piezo and ferro electric materials 2. Learn fundamentals of pyro and thermo electric materials 3. gain knowledge on shape memory alloys 4. acquire fundamental knowledge on chromic materials 	<p><i>At the end of the course, the student should at least be able:</i></p> <ol style="list-style-type: none"> 1. summarize various properties and applications of piezo and ferro electric materials 2. apply fundamental principles of pyro and thermo electricity in relevant fields of engineering 3. acquaint with various types of shape memory alloys and their properties and applications 4. appreciate the importance of chromic materials 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 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)
SCHEME OF INSTRUCTION AND EXAMINATION (R-19)
B.E. – INFORMATION TECHNOLOGY : FOURTH SEMESTER (2020 - 2021)

B.E (IT) IV Semester								
Course Code	Course Name	Scheme of Instruction			Scheme of Examination			
		Hours per week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
U19HS010EH	Human Values and Professional Ethics – I	1	-	-	2	40	30	1
U19HS430EH	Skill Development: Communication Skills in English-2	2	-	-	3	60	40	2
U19BS420MA	Probability and Statistics	3	-	-	3	60	40	3
U19PC410IT	Computer Organization	3	-	-	3	60	40	3
U19PC420IT	Database Management Systems	3	-	-	3	60	40	3
U19PC430IT	Design and Analysis of Algorithms	3	-	-	3	60	40	3
U19PC440IT	Software Engineering	3	-	-	3	60	40	3
U19OE4XXXX	Open Elective – II	3	-	-	3	60	40	3
PRACTICALS								
U19PC411IT	Database Management Systems Lab	-	-	2	3	50	30	1
U19PC421IT	Design and Analysis of Algorithms Lab	-	-	2	3	50	30	1
U19PC431IT	Software Engineering Lab	-	-	2	3	50	30	1
Student should acquire one online certification course equivalent to 2 credits during III-VII Semesters.								
Total		21	-	6	--	610	400	24
Grand Total		27			--	1010		
<i>Note:</i>								
1. One hour is allotted to Library / Sports / Mentor Interaction.								
2. The left over hours are to be allotted to CCA-II / RC / CC / TC based on the requirement.								

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

Course Name: Human Values and Professional Ethics-1

SYLLABUS FOR BE III/IV SEMESTER

(COMMON FOR ALL BRANCHES)

L:T: P (Hrs/Week):1:0:0	SEE Marks:40	Course Code: U19HS010EH
Credits: 1	CIE Marks:30	Duration of SEE:Hours:02

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: -	On completion of this course the student will be able to :
1. Get a holistic perspective of value- based education.	1. Gain a world view of the self, the society and the profession.
2. Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations.	2. Start exploring themselves in relation to others and their work –constantly evolving into better human beings and professionals.
3. Understand professionalism in harmony with self and society.	3. Inculcate Human values into their profession.
4. Develop ethical human conduct and professional competence.	4. Obtain a holistic vision about value-based education and professional ethics.
5. Enrich their interactions with the world around, both professional and personal.	

UNIT-1 Understanding the need and process for Value Education

- Basic Human Aspirations -Philosophy, purpose & objective of Life Understanding and living in harmony at various levels-with self, family, society and nature.
- Ethical and moral values** - Truth, honesty, empathy, integrity, consistency, cooperation, confidentiality, trustworthiness, self-respect, self-restraint, self-assertion, self-reliance.

UNIT-2 Holistic Understanding of Professional Ethics and Human Values

- At the level of individual: as socially and ecologically responsible engineers and technologists.
- At the level of society: as mutually enriching organizations, being work conscious.
- Recognizing the value of time and respecting time of self and others.

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

Learning Resources:

- PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
- B.L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
- A.N Tripathy, 2003 Human values, New Age International Publishers.
- 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	:	1	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	1	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING
(Autonomous)
 IBRAHIMBAGH, HYDERABAD – 500 031
Department of Humanities and Social Sciences
SKILL DEVELOPMENT: COMMUNICATION SKILLS IN ENGLISH-II
 SKILL DEVELOPMENT COURSE:II
 FOR BE 2/4-IV SEMESTER (COMMON FOR ALL BRANCHES)

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

Course Overview:

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

Course Objective:

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

Overview of the delivery Methodology:

- Students will be given Reading/Listening exercises that they have would have to do as a prerequisite for the class room intervention
- Every Session will have activities on all the four skills. Listening, Speaking, Reading and Writing
- The Writing and Reading exercises will be given in the workbook and will carry marks
- Vocabulary exercises will also be part of every session
- Students will be asked to summarise their takeaways in every class in three sentences.
- The Lateral entry students will be given a self study plan for language enhancement and will be given extra reading and writing exercises. This will be done through Talent Sprint's online portal
- To personalize the learning a variety of case studies and structured problem solving activities will be given in small groups and the trainers will facilitate peer reviews.
- Integration of continuous grading (for assignment 1 and 2), instant feedback, (peer review sheets) clear goals, rewards (certificates and appreciation kits), have been included this time for positive reinforcement.

Unit 1: Discussions and Debates**Module Overview:**

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

Learning Outcome:

The students should be able to:

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

Competencies:

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

Sessions:

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

Unit 2: Powerful Presentations**Unit Overview:**

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

Learning Outcome:

Students should be able to:

- Provide logical conclusions to the topics under discussion.

- Prepare, present, and analyze reports.
- Analyzing the points discussed.
- Connecting all points without gaps.
- Identifying clinchers.
- Communicating the decisions

Sessions:

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

Unit 3 - Effective Technical Writing

Unit Overview:

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

Learning Outcome:

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

Competencies:

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

Sessions:

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

Unit 4 - Reading for Content and Context

Unit Overview:

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

Learning Outcomes

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

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

Competencies

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

Sessions:

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

Unit 5 – Critical Reading Skills

Unit Overview:

Research shows that good reading skills can lead to well written assignments. In this unit, students will learn reading strategies to understand and retain information, to understand the organization of reading passages, and strategies for

learning and retaining vocabulary. Building on these basic strategies, students will develop skills to critically analyze texts. In addition, students will practice and develop paraphrasing and summarizing skills. Students will receive ongoing feedback on their assignments throughout the course.

Learning Outcomes

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

Competencies:

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

a. Understand the meaning of new vocabulary through:

- 1) Context clues, e.g., synonyms, antonyms, examples, definitions, and restatements, etc.
- 2) Roots and affixes

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

Sessions

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

Students are given workbooks prepared by Talent Sprint.

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

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

Duration of Internal Tests : 90 Minutes

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

PROBABILITY & STATISTICS
SYLLABUS FOR B.E. IV-SEMESTER
(For IT only)

L:T:P(Hrs/week):3:0:0	SEE Marks :60	Course Code : U19BS420MA
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>
1. Study the concepts and application of conditional probability 2. Understand various concepts of Random variables and standard Statistical Distributions 3. Study various methods of testing large samples 4. Analyze standard statistical tests employed for small samples 5. Understand fitting of a straight line to a given data and measuring Correlation between variables.	1. Apply conditional probability to the real world problems 2. Apply various statistical distributions to solve practical problems, to estimate unknown parameters of populations and apply the tests of hypotheses. 3. Infer properties of population conducting tests on samples 4. Categorize population based on tests on small samples 5. Solve problems on fitting of a straight line to the given data and also to find co-efficient of correlation and to determine regression lines and their application problems.

UNIT-I: Probability:

Basic terminology- Definition of Probability – Addition Law of probability- Independent events- Conditional Probability- Multiplication law of probability - Baye's Theorem.

UNIT-II: Probability Distributions:

Random Variables - Probability Distribution and Density function for Discrete and Continuous Random variables - Expectation – Variance – Normal Distributions.

UNIT-III: Tests of Hypothesis for Large samples:

Introduction -Testing of Hypothesis- Null and Alternative Hypothesis -Errors- -Level of Significance –Confidence Intervals - One and two tailed tests - Tests of Significance for large samples – Tests for single mean- Difference of means.

UNIT-IV:Tests of Hypothesis for Small samples:

Tests of Significance for small samples - t-test for single mean and difference of means - F- test for comparison of variances - Chi-square test for goodness of fit.

UNIT-V: Curve Fitting:

Curve fitting by the Method of Least Squares - Fitting of Straight line - Second degree parabolas – Regression - Lines of Regression - Correlation – Karl Pearson's Co-efficient of Correlation.

Learning Resources:

1. R.K. Jain & S.R.K. Iyengar, Advanced Engineering Mathematics, Third Edition, Narosa Publications, 2007.
2. Higher Engineering Mathematics, Dr.B.S Grewal 40th Edition, Khanna Publishers.
3. Advanced Engineering Mathematics, Kreyszig E, 8 th Edition, John Wiley & Sons Ltd, 2006.
4. A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.
5. Fundamentals of Mathematical Statistics, Gupta & Kapoor, Sultan chand & sons, New Delhi.
6. <http://mathworld.wolfram.com/topics>
7. <http://www.nptel.ac.in/course.php>

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

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

Duration of Internal Tests : 90 Minutes

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

COMPUTER ORGANIZATION
SYLLABUS FOR IV-SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code : U19PC410IT
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to	<i>On completion of the course, students will be able to</i>
1. Provide the fundamentals of Computer Organization, basic processing units. 2. Explain input and output interfacing, memory and pipelining concepts.	1. Understand fundamentals of computer organization and instruction formats. 2. Analyse operations of arithmetic, logic, shift and control units. 3. Identify peripheral devices and analyse modes of data transfer. 4. Analyse the efficiency of cache, main memory and secondary storage. 5. Apply pipelining process to address structural, data and control hazards.

UNIT – I: Basic Structure of Computers :

Computer Types, Functional Units, Basic Operational Concepts, Bus Structures, Software, Performance, Multiprocessors and Multicomputer, Memory locations and Addresses, Memory operations, Instructions and Instruction Sequencing, Addressing Modes, Assembly language, Additional Instructions

UNIT – II: Basic Processing Unit:

Register Transfer Language and Micro operations: Register Transfer Language, Register Transfer, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Arithmetic logic shift unit.

MICROPROGRAMMED CONTROL: Control memory, address sequencing, micro program example, Design of control unit, hardwired control, micro programmed control.

UNIT – III: Input Output Organization:

Peripheral devices, Input-output Interface, Asynchronous Data Transfer, Modes of Transfer, and Priority interrupt, Direct Memory Access.

UNIT – IV: Memory System

Some Basic Concepts, Semiconductor RAM Memories, Read -Only memories, Cache Memories, Performance considerations, Virtual Memories, Memory Management Requirements, Secondary Storage-Magnetic Hard disks, Optical Disks, Magnetic Tape Systems

UNIT – V: Pipelining:

Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction sets, Data path and control considerations, Super Scalar Operation.

Learning Resources:

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Computer Organization, 5th Edition, McGraw Hill, 2002.
2. M. M. Mano, Computer System Architecture, 3rd Edition, Prentice Hall, 1994.
3. W. Stallings, "Computer Organization and Architecture - Designing for Performance", Prentice Hall of India, 2002.
4. J .P. Hayes, "Computer Architecture and Organization", McGraw-Hill, 1998.
5. Pal Chouduri, Computer Organization and Design, 2nd Ed. Prentice Hall of India, 2007
6. D. A. Patterson and J. L. Hennessy, "Computer Organization and Design - The Hardware/Software Interface", 2005.
7. <https://nptel.ac.in/courses/106106092/>

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3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

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

DATABASE MANAGEMENT SYSTEMS
SYLLABUS FOR IV-SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code : U19PC420IT
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>
Apply the concepts of database management systems and design relational databases.	<ol style="list-style-type: none"> 1. Understand functional components of the DBMS and develop ER model for a given problem and map ER it to Relational model 2. Devise queries using Relational Algebra and SQL 3. Design a normalized database schema using different normal forms. 4. Apply indexing and hashing techniques for effective data retrieval. 5. Understand transaction processing, concurrency control and recovery techniques

UNIT – I:

Introduction to DBMS: Overview, File system vs DBMS, Advantages of DBMS, Database System Applications, Relational Databases, Object – Based and Semi-structured Databases, Data Storage and Querying, Database Architecture, Database Users and Administrators.

Database Design and the E-R Model: Overview of the Design Process, The E-R Model, Constraints, E-R Diagrams, E–R Design Issues, Weak Entity Sets, Extended E-R Features.

UNIT – II:

Relational Model: Structure of Relational Databases, Reduction to Relational Schemas, Other Aspects of Database Design. Relational Algebra: Fundamental Relational-Algebra Operations, Additional Relational – Algebra Operations, Extended Relational -Algebra Operations, Null Values, Modification of the Databases.

Structured Query Language: Data Definition, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Complex Queries, Views, Joined Relations.

UNIT – III:

Advanced SQL and PLSQL: SQL Data Types and Schemas, Integrity Constraints, Authorization, SQL functions, procedural SQL, embedded SQL, cursors, ODBC and JDBC, triggers

Schema Refinement: Features of Good Relational Design, Functional-Dependency Theory, Decomposition Using Functional Dependencies, Normalization, First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form, Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form.

UNIT – IV:

Indexing and Hashing: Basic Concepts, Ordered Indices, B+-tree Index Files, B-tree Index Files, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices, Index Definition in SQL.

Transactions: ACID properties, Transaction States, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Testing for serializability.

UNIT – V:

Concurrency Control: Lock-Based Protocols, Timestamp-Based Protocols, Validation-Based Protocols, Multiversion Schemes, Deadlock Handling.

Recovery System : Failure Classification, Storage Structure, Log-Based Recovery, Aries ,Media recovery.

Learning Resources:

1. Abraham Silberschatz, Henry F Korth, S. Sudarshan, Database System Concepts, 6th Edition, McGraw-Hill International Edition, 2011.
2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, Third Edition, McGraw-Hill International Edition, 2003.
3. Elmasri, Navathe, Somayajulu and Gupta, Fundamentals of Database System, 6th Edition, Pearson Education, 2011.
4. Patric O'Neil, Elizabeth O'Neil, Database-principles, programming, and performance, Morgan Kaufmann Publishers, 2001.
5. Peter Rob, Carlos coronel, Database Systems, (2007), Thomson.
6. <https://nptel.ac.in/courses/106105175/>

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

DESIGN AND ANALYSIS OF ALGORITHMS
SYLLABUS FOR B.E IV-SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks : 60	Course Code : U19PC430IT
Credits : 3	CIE Marks : 40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
1. Explain Asymptotic notations, time and space complexity analysis. 2. Discuss different algorithm design strategies and their applications. 3. Introduce NP-Hard and NP-Completeness concepts.	1. Understand asymptotic notations and analyze the complexity of recursive and non-recursive algorithms. 2. Illustrate divide and conquer and greedy algorithm design strategies. 3. Apply dynamic programming strategy to solve optimization problems. 4. Solve problems using backtracking and branch and bound. 5. Understand NP hard and NP completeness.

UNIT 1:

Introduction: Characteristics of algorithm. Analysis of algorithm: Asymptotic analysis of complexity bounds – best, average and worst-case behavior; Performance measurements of Algorithm, Analysis of recursive algorithms through recurrence relations: Substitution method, Recursion tree method, Amortized analysis.

UNIT 2:

Divide and conquer: The general method, Iterative and Divide and conquer for Binary search, Merge sort, Quick sort, Masters' theorem.

Greedy Method: The general method, Knapsack problem, Job sequencing with deadlines, Optimal storage on tapes, Optimal merge patterns, Huffman Codes, Dijkstra's algorithm.

UNIT 3:

Dynamic Programming: The general method, Bellman-Ford Algorithm, Multistage graph, All-Pairs Shortest Paths, Matrix chain multiplication, Optimal Binary Search trees, 0/1 Knapsack, Reliability design, Traveling Salesman Problem.

UNIT 4:

Backtracking: The general method, 8-Queens Problem, Graph Coloring, Hamiltonian cycles, Knapsack Problem

Branch and Bound: The general method, 0/1 Knapsack Problem, Traveling salesperson problem

UNIT 5:

NP-Hard and NP-Completeness: Basic concepts, NP-hard graph problems-Clique Decision Problem, Node Cover Decision Problem, NP-Hard Scheduling Problem - scheduling identical processors, NP-Hard code scheduling problems – Code generation with common sub-expression.

Learning Resources:

1. Ellis Horowitz, Sartaj Sahani, Sanguthevar Rajasekaran, " Fundamentals of computer Algorithms", Second edition (2008),Universities Press
2. Thomas H. Cormen, Leiserson C.E, Rivest.R.L , Stein.C, Introduction to Algorithm, 2nd edition (2001), MIT press, USA.Introduction to Algorithms, 4TH Edition, Thomas H Cormen, Charles E Lieserson,
3. Algorithm Design, 1ST Edition, Jon Kleinberg and ÉvaTardos, Pearson.
4. Algorithm Design: Foundations, Analysis, and Internet Examples, Second Edition, Michael T Goodrich and Roberto Tamassia, Wiley.
5. Algorithms -- A Creative Approach, 3RD Edition, UdiManber, Addison-Wesley, Reading, MA.
6. <https://nptel.ac.in/courses/106101060/>
7. <https://ocw.mit.edu/courses/electrical-engineering-and-computerscience/6-006-introduction-to-algorithms-fall-2011/lecture-videos>

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

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

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

SOFTWARE ENGINEERING
SYLLABUS FOR B.E IV- SEMESTER

L:T:P (Hrs/week): 3:0:0	SEE Marks : 60	Course Code : U19PC440IT
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
Understand the various SDLC models and stages in Software design lifecycle.	<ol style="list-style-type: none"> 1. Select the most suitable software process model out of several, for the development of a given software project. 2. Develop the ability to elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project. 3. Understand the software design principles and learn how to apply them towards implementation. 4. Compare different ways and techniques of ensuring software quality and apply various test processes and techniques on conventional applications. 5. Develop an understanding of risks inherent to software development, and provide continuous quality improvement

UNIT I

Introduction to Software Engineering: Definition of Software Engineering, application areas of software engineering, Process Framework, Process Patterns, Process Assessment, Personal and Team Process Models, Process Technology, Product and Process.

Process Models: Prescriptive Models, Waterfall Model, Incremental Process Models, Evolutionary Process Models, Specialized Process Models, and the Unified Process.

An Agile view of Process: What is Agility. What is an Agile Process, and Agile Process Models.

UNIT II

Understanding requirements: Requirement Analysis, Data Modeling Concepts, Scenario-Based Modeling, Flow-Oriented Modeling, Class-Oriented Modeling, Creating a Behavioral Modeling

Design Engineering: Design within the context of SE, Design Process, Design Concepts, and the Design Model.

UNIT III

Architectural Design: Software Architecture, Architecture Genres, Architecture Styles, Architectural Design.

Component level Design: What is a Component, Designing Class-Based Components, Conducting Component-Level Design, Component-Based development and Object Constraint Language.

Performing User Interface Design: The Golden rules, User Interface Analysis and Design, Interface Design Steps, and design Evaluation.

UNIT IV

Software Testing Strategies: A Strategic Approach to Software Testing, Strategic Issues, Validation Testing, System Testing, Black-box and White-box testing, Basis path testing, and Control Structure testing and the Art of Debugging.

Software Quality Assurance (SQA): Elements of Software Quality Assurance, SQA Tasks, Goals and Metrics, and SQA Plan, Software Configuration Management CMMI, ISO 9000 Quality Standards.

UNIT-V: Product Metrics, Risk Management

Product Metrics: A Framework for Product Metrics, Metrics for the Requirements Model, Metrics for the Design Model, Metrics for Testing, and Metrics for Maintenance.

Risk Management: Software Risks, Reactive Vs Proactive Risk Strategies, Risk Mitigation, Monitoring and management, and RMMM Plan.

Learning Resources:

1. Roger S.Pressman, Software Engineering: A Practitioners Approach, Seventh Edition, McGraHill, 2009.
2. Pankaj Jalote "An Integrated Approach to Software Engineering, Third Edition, Narosa Publishing house, 2008.
3. James F.Peters, WitoldPedrycz, Software Engineering-An engineering Approach, John Wiley Inc., 2000.
4. Ali Behforoz and Frederic J.Hadson, Software Engineering Fundamentals, Oxford University Press, 1997.
5. <https://nptel.ac.in/downloads/106105087/>

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

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

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

DATABASE MANAGEMENT SYSTEMS LAB
SYLLABUS FOR B.E. IV SEMESTER

L:T:P(Hrs/week): 0:0:2	SEE Marks :50	Course Code:U19PC411IT
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>
Implement various SQL and PL/SQL constructs and develop small size database application.	<ol style="list-style-type: none"> 1. Design and implement a database schema 2. Devise queries using SQL commands 3. Develop application programs using PLSQL 4. Generate reports for given requirements

1. DDL Commands:

- a. Creation of tables with appropriate integrity constraints
- b. Usage of alter, drop commands

2. DML Commands:

- a. Data Insertion and Updating
- b. Usage of truncate command

3. TCL and DCL Commands:

- a. Setting privileges
- b. save point, commit and rollback commands

4. SQL Queries:

- a. Simple SQL queries using Select
- b. SQL Built-in functions
- c. SQL Operators and Nested queries

5. a. Joins and aggregate functions
- b. Grouping and ordering commands

6. PL/SQL:

- a. Blocks, Select Statement and control statements
- b. Stored procedures and functions
- c. Packages and Exception Handling
- e. Cursors
- f. Triggers

7. REPORTS:

- a. Creation of Reports based on different queries.
- b. Creation of full-fledged Database Application.

Learning Resources:

1. Ivan Bayross, SQL, PL/SQL, The Programming Language of Oracle,4th Edition, PBP Publications. Reference Books 1. NileshShah, Database Systems Using Oracle, 2nd Edition(2007), PHI.
2. Rick F Van der Lans, Introduction to SQL, 4thEdition(2007), Pearson Education.
3. Benjamin Rosenzweig Elena Silvestrova, Oracle PL/SQL by Example, 3rdEdition(2004), Person Education.
4. Albert Lulushi, Oracle Forms Developer's Handbook, 1st Edition(2006), Pearson Education.
5. <https://www.lynda.com/Accessutorials/Welcome/195854/373426-4.html>

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2Hours			

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF INFORMATION TECHNOLOGY
DESIGN AND ANALYSIS OF ALGORITHMS LAB
SYLLABUS FOR B.E. IV SEMESTER

L:T:P (Hrs/week):0:0:2	SEE Marks : 50	Course Code : U19PC421IT
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>
Develop skills in design and implementation of abstractions of various algorithm strategies and their practical applications.	1. Apply divide and conquer approach to solve searching and sorting problems. 2. Design and implement algorithms using Greedy strategy for the problems; Fractional knapsack, Huffman codes, shortest path finding (Dijkstra's algorithm). 3. Use Dynamic programming approach to solve problems including, shortest path finding (Bellman ford algorithm, All pair shortest path), Matrix chain multiplication, 0/1 Knapsack problem. 4. Solve N-Queens problem and Graph colouring problem using Backtracking approach. 5. Implement Branch & Bound algorithm for 0/1 Knapsack problem and Travelling Salesman problem.

- 1) A) Implement a stack using a linked list such that the push and pop operations of stack still take $O(1)$ time.
 B) Implement a queue using a linked list such that the enqueue and dequeue operations of queue take $O(1)$ time
- 2) Implement Linear Search, Binary Search and Hashing.
- 3) Implement a parallelized Merge Sort algorithm and Quick sort algorithm to sort a given set of elements and determine the time required to sort the elements. Repeat the experiment for different values of n , the number of elements in the list to be sorted and plot a graph of the time taken versus n . The elements can be read from a file or can be generated using the random number generator. Program to be executed for various sizes of input. Fill the given table. Obtaining a constant value in the column "time taken" would prove that the complexity of merge sort is same in all case.

Size	Ascending		Descending		Random Order	
	Input	Time taken	Input	Time taken	Input	Time taken
4						
8						
16						
32						

- 4) Implement Knapsack Algorithm using Greedy Strategy.
- 5) Implement optimal merge patterns – Huffman encoding algorithm.
- 6) From a given vertex in a weighted connected graph, find single source shortest path to other vertices using a) Dijkstra's algorithm b) Bellman ford algorithm.
- 7) Implement Matrix –chain multiplication algorithm using dynamic programming.
- 8) Implement All-pairs shortest path algorithm.
- 9) Implement 0/1 Knapsack algorithm.
- 10) Implementation of N-queens problem using back tracking.
- 11) Implement Graph coloring problem using back tracking.
- 12) Develop a program to check whether a given graph is connected or not using DFS method.
- 13) Implement 0/1 knapsack using branch and bound.
- 14) Implement Travelling salesman problem using branch and bound.

Learning Resources:

1. Ellis Horowitz, Sartaj Sahani, Sanguthevar Rajasekaran, " Fundamentals of computer Algorithms", Second edition (2008),Universities Press
2. Thomas H. Cormen, Leiserson C.E, Rivest.R.L , Stein.C, Introduction to Algorithm, 2nd edition (2001), MIT press, USA.Introduction to Algorithms, 4TH Edition, Thomas H Cormen, Charles E Lieserson,
3. Algorithm Design, 1ST Edition, Jon Kleinberg and ÉvaTardos, Pearson.
4. Algorithm Design: Foundations, Analysis, and Internet Examples, Second Edition, Michael T Goodrich and Roberto Tamassia, Wiley.
5. Algorithms -- A Creative Approach, 3RD Edition, UdiManber, Addison-Wesley, Reading, MA.
6. B.A.Forouzan & Richard F.Gilberg, "A Structured Programming Approach using C" 2nd Edition, Cengage Learning, 2007.
7. Mark A Weiss, Data Structures and Algorithm Analysis In C, Second Edition(2002), Pearson

8. <https://ocw.mit.edu/courses/electrical-engineering-and-computerscience/6-006-introduction-to-algorithms-fall-2011/lecture-videos>
9. <http://nptel.ac.in/courses/106106127/>
10. <http://www.nptel.ac.in/courses/106102064>

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2Hours			

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

SOFTWARE ENGINEERING LAB
SYLLABUS FOR B.E. IV SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks : 50	Course Code : U19PC431IT
Credits : 1	CIE Marks : 30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
Understand the concepts related to analysis, design, testing and Management techniques related to Object Oriented Software development.	<ol style="list-style-type: none"> 1. Understand fundamental concepts and object-oriented techniques of systems analysis and design. 2. Be able to gather and document system requirements. 3. Generate and run test cases for various levels of testing by applying different testing methods. 4. Demonstrate the ability to use project management tools 5. Use of computer based tools to aid in system analysis and design.

1. System Definition
 - a) Requirements Management
 - b) Data Modeling
2. Design Modeling
 - a) Use case Diagram
 - b) Class Diagram
 - c) Sequence Diagram
 - d) Collaboration Diagram
 - e) State Chart Diagram
 - f) Activity Diagram
 - g) Component Diagram
 - h) Deployment Diagram
3. Software Development
 - a) Application & Web modeling
 - b) Configuration Management
 - c) Unit Testing
4. Content Management
5. System Testing
 - a) Functional Testing
 - b) Reliability Testing
 - c) Performance Testing
 - d) Defect & Change Tracking
6. Change Management
 - a) Configuration Management
 - b) Requirement Management
 - c) System Documentation
7. Project Management

Learning Resources:

1. Grady Booch, James Rumbaugh, Ivor Jacobson, The Unified Modeling Language-User Guide(Covering UML 2.0), Second Edition, Pearson Education, India,2007.
2. Ivor Jacobson, Grady Booch, James Rumbaugh, The Unified Software Development Process, Pearson Education, India, 2008.
3. http://nptel.iitg.ernet.in/Comp_Sci_Engg/IIT%20Madras/Object%20Oriented%20System%20Design.htm
4. <http://nptel.ac.in/courses/106105153/>

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2Hours			

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

Dept	Title	Code	credits
Civil	DISASTER MANAGEMENT	U19OE410CE	3
CSE	INTRODUCTION TO DATA STRUCTURES	U19OE410CS	3
CSE	INTRODUCTION TO SOFTWARE ENGINEERING	U19OE420CS	3
ECE	MATHEMATICAL PROGRAMMING FOR ENGINEERS	U19OE410EC	3
ECE	INTRODUCTION TO COMMUNICATION SYSTEMS	U19OE420EC	3
IT	INTRODUCTION TO OBJECT ORIENTED PROGRAMMING	U19OE410IT	3
IT	INTRODUCTION TO SCRIPTING LANGUAGES	U19OE420IT	3
Mech.	OPTIMIZATION METHODS	U19OE410ME	3
Physics	INTRODUCTION TO OPTOELECTRONIC DEVICES	U19OE410PH	3
HSS	CRITICAL THINKING	U19OE410EH	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: U19OE410CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
<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 measures 3. 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 India 3. Understand different types of manmade disasters, their occurrence, Effects, Mitigation and Management Systems in India. 4. Explain the utility of geography information systems (GIS), Remote sensing technology in all phases of disaster mitigation and management. 5. Understand the Role of Remote Sensing and Geographical Information Systems (GIS) in Disaster Management

UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

Learning Resources:

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

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

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

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)
 IBRAHIMBAGH, HYDERABAD – 500 031
Department of Computer Science & Engineering
 INTRODUCTION TO DATA STRUCTURES (OPEN ELECTIVE-II)

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

L:T:P (Hrs./week):3:0:0	SEE Marks:60	Course Code :U190E410CS
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>
1 Identify and use appropriate data structure for a given problem.	1 Implement linear data structures
2 Describe the linear and nonlinear data structures.	2 Develop an application using stacks and queues.
	3 Choose the appropriate nonlinear data structure and perform various operations on trees.
	4 Perform various operations on graphs.
	5 Analyze the time and space complexities of Algorithms.

UNIT – I:**Arrays:** Arrays - ADT, Polynomials, Sparse matrices,**Linked Lists:** Singly Linked Lists, Circularly linked lists, Doubly Linked Lists.**UNIT – II :****Stacks:** Array Representation, Linked Representation, Applications.**Queues:** Array Representation, Linked Representation, Applications.**UNIT – III: Introduction to non linear Data Structures:** Tree Definitions and Properties, Representations of Binary Trees, Operations, Binary Tree Traversal**UNIT-IV: Graphs:** Graph Definitions, properties and representations, Elementary Graph operations, Minimum Cost Spanning Trees- Kruskal's Algorithm, Prim's Algorithm.**UNIT-V: Performance analysis-** time complexity and space complexity, Asymptotic Notation-Big O, Omega and Theta notations**Learning Resources:**

- Horowitz E, Sahni S and Susan Anderson-Freed, Fundamentals of Data structures in C, 2nd Edition(2008), Universities Press
- Mark A Weiss, Data Structures and Algorithm Analysis In C, Second Edition(2002), Pearson
- Kushwaha D. S and Misra A.K, Data structures A Programming Approach with C, Second Edition(2014), PHI.,
- Gilberg R. F and Forouzan B. A, Data structures: A Pseudocode Approach with C, Second Edition(2007), Cengage Learning
- Tanenbaum A. M , Langsam Y. Augenstein M. J, Data Structures using C, Second Edition (2008), Pearson.
- Thomas H. Cormen, Charles E. Leiserson, Ronald L Rivest, Clifford Stein, Introduction to Algorithms, Third Edition(2009), MIT Press
- Yedidyah Langsam , Moshe J. Augenstein ,Aaron M. Tenenbaum, Data Structures Using C and C++ , Second Edition(2009), PHI
- <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-fall-2011/lecture-videos>
- <http://nptel.ac.in/courses/106106127/>
- <http://www.nptel.ac.in/courses/106102064>

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

1	No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Tests	:	<input type="text" value="30"/>
2	No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3	No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Tests : 1 Hour 30 Minutes

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

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

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

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code :U190E420CS
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>	
1	understand the concepts involved in the lifecycle of software development	1	Explain the software development lifecycle models for software system development.
2	learn the best practices to be employed for the design, and testing of a software project.	2	Learn the requirement process steps in software process model.
		3	Analyze the structural design models in object oriented system.
		4	Analyze the behavioral design models used in object oriented system.
		5	Identify verification and validation methods in a software engineering project at various phases of SDLC .

UNIT-I:**Introduction to Software Engineering:**

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

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

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

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

UNIT-III:

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

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

UNIT-IV:

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

Architectural Modelling: Artifacts, Artifact diagrams, Deployment diagrams.

UNIT-V:

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

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

Learning Resources:

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, 6th Edition (2005), Tata McGrawHill.
2. Grady Booch, James Rumbagu, Ivor Jacobson, The Unified Modeling Language-User guide, (Covering UML 2.0) ,2nd Edition Pearson Education, India 2007.
3. Pankaj Jalote, An Integrated Approach to Software Engineering, 3rd Edition (2005), Narosa Publishing House.
4. <http://nptel.ac.in/courses/106101061/>
5. <http://istqbexamcertification.com/what-is-a-software-testing/>
6. <http://agile.csc.ncsu.edu/SEMaterials/UMLOverview.pdf>

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

1	No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Tests	:	<input type="text" value="30"/>
2	No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3	No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>
Duration of Internal Tests		:	1 Hour 30 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
 IBRAHIMBAGH, HYDERABAD – 500 031
 DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Mathematical Programming for Engineers
 (OPEN ELECTIVE - II)
 SYLLABUS FOR B.E. V - SEMESTER (for other branches)

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: U19OE410EC
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 polyval 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:

- Getting started with MATLAB "A quick introduction for scientist and engineers by RudraPratap, Oxford publications.
- 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.
- Stephen J. Chapman-"MATLAB Programming for Engineers"- 5th Edition- Cengage Learning- 2015. Getting started with MATLAB (Version 9) The Math works.
- An Introduction to MATLAB® Programming and Numerical Methods for Engineers 1st Edition by Timmy Siau Alexandre Bayen, Elsevier-18th April 2014.
- <https://nptel.ac.in/courses/103106118/2>
- <https://www.udemy.com/numerical-methods/>

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

1. No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Tests	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Tests: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Introduction to Communication Systems

(OPEN ELECTIVE - II)

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

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: U19OE420EC
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

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

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

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

1. No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Test	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Tests: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. IV-SEMESTER
OPTIMIZATION METHODS (Open Elective-II)

Instruction : 3Hours /week	SEE Marks : 60	Course Code : U19OE410ME
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

Course Objectives	Course Outcomes
<p>The objectives of this course are to:</p> <p>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)</p>	<p>On completion of the course, the student will be able to:</p> <ol style="list-style-type: none"> 1. Optimization of resources in multi disciplinary areas through linear programming under different conditions. 2. Sensitivity analysis of a linear programming problem as per customer requirements to suit various Organizations. 3. Minimization of total cost to apply for transportation techniques for the transshipment of Goods and products and Implement techniques like project management to analyze about material management. 4. Optimization of resources in multi disciplinary areas through non-linear programming under different conditions.

UNIT-I**Optimization-An overview**

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

UNIT-II**Advanced topics in Linear programming**

Duality in LPP, Differences between primal and dual, shadow prices, Dual simplex method, sensitivity analysis. special cases in LPP.

UNIT-III**Transportation Model**

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

Project Scheduling

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

UNIT-IV**Non linear programming problems**

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

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

UNIT-V

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

Learning Resources:

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

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

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

Duration of Internal Test: 1 Hour 30 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: U19OE410IT
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>
Explain the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, building simple GUI applications.	1. Understand fundamental concepts in Object oriented approach. 2. Develop object-oriented programs using the concepts of exception handling and multi threading. 3. Demonstrate the usage of Java I/O streams to handle user input and output. 4. Design and develop GUI programs. 5. Develop Applets for web applications.

UNIT- I

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

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

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

Interfaces: Defining interfaces, extending interfaces, implementing interfaces.

UNIT- II

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

UNIT- III

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

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

UNIT- IV

Introducing AWT working with Graphics: AWT Classes, Working with Graphics.

Event Handling: The Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces.

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

UNIT- V

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

Learning Resources:

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

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

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

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

INTRODUCTION TO SCRIPTING LANGUAGES
 (Open Elective-II) (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 :U19OE420IT
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>
This course will enable the students to acquire basic skills for writing python scripts.	<ol style="list-style-type: none"> 1. Write a python script to solve a basic problem using structured programming constructs 2. Write a python script to solve a basic problem using object oriented programming constructs 3. Create and use python modules 4. Handle file related operations 5. Encode and decode strings

Unit – I

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

Unit – II

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

Unit – III

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

Unit – IV

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

Unit – V

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

Learning Resources

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

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal 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 PHYSICS

INTRODUCTION TO OPTOELECTRONIC DEVICES
Open elective Course

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

Course Objectives	Course Outcomes
<p><i>The student will be able to</i></p> <ol style="list-style-type: none"> gain knowledge on working of optoelectronic light sources like LED grasp the concepts of lasing action, merits and demerits of lasers acquire the fundamental knowledge on photo-detectors. Narrate the properties of chromic materials 	<p><i>At the end of the course, the student should at least be able:</i></p> <ol style="list-style-type: none"> accustom with various device structures of optoelectronic light sources like LED acquaint with various types of lasers and their applications assimilate working and use of photo detectors and solar cells in various applications appreciate the importance of chromic materials in engineering field

UNIT-I: LIGHT EMITTING DIODES

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

UNIT-II: SEMICONDUCTOR LASERS

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

UNIT-III: SOLAR CELLS

Solar spectrum-Solar Cell- Photovoltaic effect- I-V characteristics of solar cell -fill factor, efficiency- materials fabrication of solar cells-thin film solar cell-solar panels- applications of solar cells.

UNIT-IV: PHOTODETECTORS

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

UNIT-V: CHROMIC MATERIALS (6 hours)

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

Learning Resources:

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

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

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

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

CRITICAL THINKING
 OPEN ELECTIVE B.E.-2/4- IV Semester

L:T:P(Hrs/week):3:0:0	SEE : 60	Course code : U19OE410EH
Credits : 3	CIE : 40	Duration of SEE : 3 Hours

<p>Course Objectives</p> <p>To help students:</p> <ul style="list-style-type: none"> • Identify the core skills associated with critical thinking. • Comprehend the various techniques of critical thinking. • Understand where to look for bias and assumptions in problem analysis • Understand Structure, standards, and ethics of critical thinking <p>Students will learn</p> <ul style="list-style-type: none"> • How to control and evaluate their thought processes • How to reason effectively and consistently • Problem analysis best practices - using their decision time most effectively 	<p>Course Outcomes</p> <p>At the end of the course the student will be able to</p> <ul style="list-style-type: none"> • Analyse and use techniques for comparing alternative solutions • Demonstrate the difference between deductive and inductive reasoning. • Construct a logically sound and well-reasoned argument. • Evaluate, identify, and distinguish between relevant and irrelevant information • Formulate a thesis or Hypothesis • Employing Evidence/Information Effectively
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UNIT I - Components of Critical Thinking

1. Applying Reason
2. Open Mindedness
3. Analysis
4. Logic

UNIT II - Non-Linear Thinking

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

UNIT III - Logical Thinking

1. Ask the Right Questions
2. Organize the Data
3. Evaluate the Information
4. Draw Conclusions

UNIT IV - Evaluate Information

1. Making Assumptions
2. Watch out for Bias
3. Ask Clarifying Questions
4. SWOT Analysis

UNIT-V - Problem Solving

1. Identify Inconsistencies
2. Trust Your Instincts
3. Asking Why?

METHODOLOGY:-

Case Studies
Demonstration
Expert lectures
Writing and Audio-visual lessons

ASSESSMENT :-

Online assignments
Individual and Group Presentations

Learning Resources:-

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

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

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2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05
	Duration of Internal Test: 90 Minutes			