

**VASAVI COLLEGE OF ENGINEERING
(AUTONOMOUS)**

Ibrahimbagh, Hyderabad-31

Approved by A.I.C.T.E., New Delhi and
Affiliated to Osmania University, Hyderabad-07

**Sponsored
by
VASAVI ACADEMY OF EDUCATION
Hyderabad**



**SCHEME OF INSTRUCTION AND SYLLABI UNDER CBCS FOR
B.E. (CSE) III and IV Semesters
With effect from 2020-21
(For the batch admitted in 2019-20)
(R-19)**



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
Phones: +91-40-23146020, 23146021
Fax: +91-40-23146090**

With effect from the Academic Year 2020-21

Institute Vision

Striving for a symbiosis of technological excellence and human values

Institute Mission

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

Department Vision

To be a center for academic excellence in the field of Computer Science and Engineering education to enable graduates to be ethical and competent professionals.

Department Mission

To enable students to develop logic and problem solving approach that will help build their careers in the innovative field of computing and provide creative solutions for the benefit of society.

With effect from the Academic Year 2020-21

B.E (CSE) Program Educational Objectives (PEO's)

Graduates should be able to utilize the knowledge gained from their academic program to:

PEO I	Solve problems in a modern technological society as valuable and productive engineers.
PEO II	Function and communicate effectively, both individually and within multidisciplinary teams.
PEO III	Be sensitive to the consequences of their work, both ethically and professionally, for productive professional careers.
PEO IV	Continue the process of life-long learning.

B.E. (CSE) PROGRAM OUTCOMES (PO's)	
Engineering Graduates will be able to:	
PO1	Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	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.
PO3	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.
PO4	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.
PO5	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.
PO6	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.
PO7	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.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
P10	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.
P11	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.
P12	Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

With effect from the Academic Year 2020-21

B.E (CSE) PROGRAM SPECIFIC OUTCOMES (PSO's)	
PSO I	Graduates will have knowledge of programming and designing to develop solutions for engineering problems.
PSO II	Graduates will be able to demonstrate an understanding of system architecture, information management and networking.
PSO III	Graduates will possess knowledge of applied areas of computer science and engineering and execute them appropriately.

I. Attendance and Sessional marks requirements:

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

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

S No.	Semester/Class	Conditions to be fulfilled
1	I-SEM TO II- SEM	Regular course of study of I-SEM and 40% aggregate CIE marks in I-SEM
2	II-SEM TO III SEM	Regular course of study of II SEM and 40% aggregate CIE marks in II-SEM
		Must have secured at least 50% of total credits prescribed for I and II SEMs together
3	III-SEM to IV-SEM	Regular course of study of III-SEM and
		40% aggregate CIE marks in III-SEM
4	IV-SEM to V-SEM	Regular course of study of IV SEM
		40% aggregate CIE marks in IV-SEM
		Passed in all the courses of I and II SEMs
		Must have secured atleast 50% of total credits prescribed for III and IV SEMs put together
5	V-SEM to VI-SEM	Regular course of study V-SEM 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-

With effect from the Academic Year 2020-21

		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	Regular course of study of III-SEM and 40% aggregate CIE marks in III-SEM
2	IV-SEM to V-SEM	Regular course of study of IV SEM
		40% aggregate CIE marks in IV-SEM
		Must have secured at least 50% of total credits prescribed for III and IV SEMs put together
3	V-SEM to VI-SEM	Regular course of study V-SEM 40% aggregate CIE marks in V-SEM
4	VI-SEM to VII-SEM	Regular course of study of VI SEM
		40% aggregate CIE marks in VI-SEM
		Passed in all the courses of III and IV SEMs
		Must have secured at least 50% of total credits prescribed for V and VI SEMs put together
5	VII-SEM to VIII-SEM	Regular course of study of VII SEM 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 2019-20 ADMITTED BATCH
B.E. – COMPUTER SCIENCE & ENGINEERING : III SEMESTER (2020 - 2021)

B.E (CSE) III Semester									
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination				
		Hours per Week			Duration in Hrs	Maximum Marks		Credits	
		L	T	P/D		SEE	CIE		
THEORY									
U19HS330EH	Skill Development - I : Communication Skills in English	2	-	-	3	60	40	2	
U19HS010EH	Human Values and Professional Ethics-I	1	-	-	2	40	30	1	
U19BS320MA	Transform Calculus, Probability and Statistics	3	-	-	3	60	40	3	
U19PC310CS	Logic and Switching Theory	3	-	-	3	60	40	3	
U19PC320CS	Data Structures	3	-	-	3	60	40	3	
U19PC330CS	Object Oriented Programming	3	-	-	3	60	40	3	
U19PC340CS	Computer Architecture	3	-	-	3	60	40	3	
U19OE3XXXX	Open Elective-I	2	-	-	3	60	40	2	
U19MC310ME	Introduction to Entrepreneurship	1	-	-	2	40	30	0	
PRACTICALS									
U19PC321CS	Data Structures Lab	-	-	2	3	50	30	1	
U19PC331CS	Object Oriented Programming Lab	-	-	2	3	50	30	1	
TOTAL		21	0	4	-	600	400	22	
GRAND TOTAL		25			-	1000		-	
Student should acquire one online course certification equivalent to two credits during III Sem to VII Sem									
Left over hours are allocated for Extra Curricular Activities, Co-Curricular Activities, Sports / Library /Mentor Interaction / CC / RC / TC									

VASAVI COLLEGE OF ENGINEERING(Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department Of Humanities and Social Sciences

Skill Development - I : Communication Skills in English

SYLLABUS FOR BE -III SEMESTER
(COMMON FOR ALL BRANCHES)

L :T:P(Hrs/Week) : 2:0:0	SEE Marks: 60	Course Code: UI9HS330EH
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

Course Overview:

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

Course Objective:

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

Overview of the delivery Methodology:

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

Unit1 – Fundamentals of Communication

Unit Overview:

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

Learning Outcome:

The students should be able to:

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

Competencies:

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

Sessions:

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

Unit 2 - Narrations and Dialogues

Unit Overview:

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

Learning Outcome:

The students should be able to

- Narrate a message/story/incident, both verbally and in writing.
- Describe an event/a session/ a movie/ an article/image
- Understand Vocabulary in context

Competencies:

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

Sessions:

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

Unit 3 - Rational Recap

Unit Overview:

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

Learning Outcome:

The students should be able to:

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

Competencies:

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

Sessions:

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

Unit 4: Technical Expositions and Discussions

Unit Overview:

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

Learning Outcome:

The students should be able to:

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

Competencies:

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

Sessions:

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

Unit 5: Drawing Conclusions

Unit Overview:

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

Learning Outcome:

Students should be able to:

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

Competencies:

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

Sessions:

1. Reasoning
2. Analyzing
3. Generalization and Prediction

Students are given workbooks prepared by Talent sprint.

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

1	No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Test	:	<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

With effect from the Academic Year 2020-21

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department Of Humanities & Social Sciences

Human Values and Professional Ethics-1

SYLLABUS FOR B.E- III 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: 02 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of this course the student will be able to:</i>
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

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

UNIT-2

Holistic Understanding of Professional Ethics and Human Values

- a) At the level of individual: as socially and ecologically responsible engineers and technologists.

With effect from the Academic Year 2020-21

- b) At the level of society: as mutually enriching organizations, being work conscious.
- c) Recognizing the value of time and respecting time of self and others.

MODE OF DELIVERY

<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
---	--

Relevant Websites, CD's and Documentaries

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

Learning Resources:

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

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

1	No. of Internal Tests	:	<input type="text" value="1"/>	Max. Marks for each Internal Test	:	<input type="text" value="20"/>
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

With effect from the Academic Year 2020-21

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Mathematics

TRANSFORM TECHNIQUES, PROBABILITY & STATISTICS

SYLLABUS FOR B.E. III-SEMESTER

L :T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code: U19BS320MA
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 Fourier series, conditions for expansion of function and half range series	1 Expand any function which is continuous, Discontinuous, even or odd in terms of its Fourier series.
2 Study the concept of Fourier, Sine, Cosine and inverse Fourier Transform Sine and Cosine transform of a function and various properties.	2 Determine Fourier transform, Fourier sine and cosine transform and inverse Fourier, Sine and Cosine transform of a function.
3 Study various methods of testing large samples	3 Infer properties of population conducting tests on samples
4 Analyze standard statistical tests employed for small samples	4 Categorize population based on tests on small samples
5 Understand fitting of a straight line to a given data and measuring Correlation between variables	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: Fourier series:

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

UNIT-II: Fourier Transforms:

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

UNIT-III: Probability:

Random Variables - Discrete and Continuous Random variables-Properties-Distribution functions and densities - Expectation – Variance –Normal Distributions.

UNIT-IV: Test of Hypothesis:

Introduction -Testing of Hypothesis- Null and Alternative Hypothesis -Errors- -Level of Significance-Confidence Intervals -Tests of Significance for small samples - t-test for single mean - F- test for comparison of variances - Chi-square test for goodness of fit.

UNIT-V: Regression & Correlation :

The Method of Least Squares - Fitting of Straight line- Regression - Lines of Regression- Correlation – Karl Pearson’s Co-efficient of Correlation

Learning Resources:

1. R.K. Jain & S.R.K. Iyengar, Advanced Engineering Mathematics, Third Edition, Narosa Publications, 2007.
2. Higher Engineering Mathematics, Dr.B.S Grewal 40th Edition, Khanna Publishers.
3. 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.

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 : 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

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

Department of Computer Science & Engineering

LOGIC AND SWITCHING THEORY

SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week):3:0:0	SEE Marks:60	Course Code: U19PC310CS
Credits :3	CIE Marks :40	Duration of SEE : 3Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
1 Understand the use of logic minimization methods and to solve the Boolean logic expressions.	1 Apply Boolean logic postulates and Karnaugh-Map to simplify Boolean expressions.
2 Design combinational and sequential circuits.	2 Apply tabulation method to minimize Boolean expressions. 3 Design combinational circuits such as adders, encoders and multiplexers. 4 Design sequential circuits like counters and registers. 5 Design a circuit using programmable logic devices.

UNIT-I: Boolean Algebra:

Axiomatic definition of Boolean Algebra, Postulates and Theorems, Boolean Functions, Canonical Forms and Standard Forms, Simplification of Boolean Functions Using Theorems and Karnaugh Map Method.

UNIT-II:

Minimization of Switching Functions: Quine-McCluskey Tabular Method, Determination of Prime Implicants and Essential Prime Implicants.

Implementation of Boolean Functions: Single-Output and Multiple-Output Combinational Circuit Design, AND-OR, OR-AND and NAND & NOR Realizations, Exclusive-OR and Equivalence functions.

UNIT-III:

Design of Combinational Logic Circuits: Analysis Procedure, Design Procedure, Modular Combinational Logic Elements- Decoders, Encoders, Priority Encoders, Multiplexers and De-multiplexers.

Design of Integer Arithmetic Circuits using Combinational Logic: Integer Adders – Binary Adders, Subtractors, Ripple Carry Adder and Carry Look Ahead Adder, and Carry Save Adders.

UNIT-IV:

Introduction to Sequential Circuit Elements: Latches, Various types of Flip-Flops, Excitation Tables.

Models of Sequential Circuits: Moore Machine and Mealy Machine, Analysis of Sequential Circuits-State Table and State Transition Diagrams. Design of Sequential Circuits-Counters. Moore and Mealy State Graphs for Sequence Detection, Methods for Reduction of State Tables and State Assignments.

UNIT-V:

Design of Combinational Circuits using Programmable Logic Devices (PLDs): Read Only Memory (ROM), Programmable Logic Array (PLA), Programmable Array Logic (PAL) devices.

Learning Resources:

1. Morris Mano M and Michael D Ciletti, Digital Design, 4th Edition (2008), Prentice Hall of India.
2. ZviKohavi, Switching and Finite Automata Theory, 2nd Edition(1978), Tata McGraw Hill.
3. Charles H. Roth, Jr., Larry L. Kenny, Fundamentals of Logic Design, 7th Edition(2013), Cengage Learning.
4. Anand Kumar A, Switching Theory and Logic Design, 2nd Edition(2014), PHI Publishers.
5. CH Roth , Fundamentals of Logic Design, 4th Edition(2006), Jaico Publishers.
6. <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-111-introductory-digital-systems-laboratory-spring-2006/>
7. <http://www.facweb.iitkgp.ernet.in/~isg/SWITCHING/>

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 : 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

DATA STRUCTURES

SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week):3:0:0	SEE Marks: 60	Course Code: U19PC320CS
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 with effective utilization of space and time.	1 Compute time and space complexities of Algorithms. Design a solution to a given problem using arrays.
2 Describe the linear and nonlinear data structures.	2 Develop applications using stacks, queues and linked lists.
3 Analyze the complexities of different sorting techniques.	3 Choose the appropriate nonlinear data structure and perform operations on them.
	4 Choose suitable sorting technique to maximize the performance of the solution. Select the hashing technique to perform dictionary operations.
	5 Explain operations on Efficient Binary Search Trees and Multiway Search Trees.

UNIT-I:

Basic concepts: Algorithm Specification- Introduction, Recursive algorithms, Data Abstraction, Performance analysis- time complexity and space complexity, Asymptotic Notation-Big O, Omega and Theta notations.

Arrays: Arrays - ADT, Polynomials, Sparse matrices, Strings-ADT, Pattern Matching.

UNIT-II:

Stacks and Queues: Stacks, Stacks using dynamic arrays, Queues, Circular Queues using dynamic arrays, A Mazing Problem, Evaluation of Expressions – Evaluating Postfix Expression, Infix to Postfix.

With effect from the Academic Year 2020-21

Linked Lists: Singly Linked Lists and Chains, Linked Stacks and Queues, Polynomials, Operations for Circularly linked lists, Equivalence Classes, Sparse matrices, Doubly Linked Lists.

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.

Graphs: The Graph ADT, Elementary graph operations, Minimum Cost Spanning Trees- Kruskal's Algorithm, Prim's Algorithm.

UNIT-IV:

Sorting: Insertion Sort, Quick sort, Merge sort, Heap sort, Sorting on Several Keys, List and Table Sorts.

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

UNIT-V:

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

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.

Learning Resources:

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

With effect from the Academic Year 2020-21

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

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

2 No. of Assignments : Max. Marks for each Assignment :

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

Duration of Internal Tests : 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

OBJECT ORIENTED PROGRAMMING

SYLLABUS FOR B.E. III-SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks:60	Course Code: U19PC330CS
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 Apply object oriented principles for developing an application using Java constructs. 2 Design model view and controller enabled Java application.	1 Apply the object oriented programming concepts to solve a problem 2 Employ runtime error handling, concurrent programming practices to develop a parallel processing application 3 Perform I/O operations to develop an interactive Java application. 4 Design a Java utility using the collection framework 5 Apply functional programming constructs and understand a large scale project development architecture style.

UNIT-I:

Object Oriented System Development: Understanding Object Oriented Development, Understanding Object Concepts, Benefits of Object Oriented Development.

Java Programming Fundamentals: Introduction, Overview of Java, JVM Architecture, Data types, Variables and Arrays, Operators, Control Statements, Classes and Methods, Garbage Collection, this keyword, final, Inheritance, Method Overriding.

UNIT-II: Singleton class, Abstract class, Nested class, Interface, Package. Exception Handling, Multithreaded Programming, Deadlock.

UNIT-III:

StringHandling: String, StringBuffer and StringBuilder

Java.lang: Type Wrapper, Process, Runtime, Object class, Generics

IO: Java I/O Classes and Interfaces, Files and Directories, Byte and Character Streams, Serialization.

Regular Expressions: Pattern, Matcher, Regular expression Syntax

UNIT-IV: Collections:

Overview, Collection Interfaces, Collection Classes, Iterators, List, Set, Maps, Comparator, Arrays, Legacy Classes and Interfaces, StringTokenizer, BitSet, Date, Calendar, Random, Observable, Timer.

UNIT-V:

Lambda expressions: Expressions, Functions, lambda as argument

Stream API: Basics, Filter, Sort, Map, Collect

Regular Expressions: Pattern, Matcher, Regular expression Syntax

MVC: Architecture, Usecase

Learning Resources:

1. Herbert Schildt, The Complete Reference Java, 10th Edition, Tata McGraw Hill 2018.
2. Joshua Bloch, Effective Java, 3rd Edition, Pearson, 2017
3. Timothy Budd, An introduction to Object-Oriented Programming, 3rd Edition, Pearson Education, 2008
4. Eric Freeman, Bert Bates, Kathy Sierra, Head First Design Patterns: A Brain-Friendly Guide, 1st Edition, O'Reilly, 2016
5. P. Radha Krishna, Object Oriented Programming through Java, Universities Press, 2007.
6. Sachin Malhotra, Saurabh Choudhary, Programming in Java, 2nd Edition, Oxford Press, 2014.
7. <https://docs.oracle.com/javase/tutorial/java>

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 : 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

COMPUTER ARCHITECTURE

SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : U19PC340CS
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 Learn the structure and behavior of various functional modules of a computer and identify how they interact to provide the processing needs of the user.	1 Draw the functional block diagram of single bus architecture of a computer and describe the register transfer notations of instruction execution sequencing.
2 Design memory modules and enhance performance of a CPU using pipelining techniques	2 Compare Hardwired control unit and micro programmed control unit in the design of CPU. 3 Explain the techniques used by a computer to communicate with I/O devices. 4 Design a memory module using memory organization techniques 5 Apply design techniques to enhance the performance of CPU using pipelining.

Unit I:

Basic Structure of Computers: Computer Types, Functional Units, Basic Operational Concepts, Bus Structures, Software, Performance, Multiprocessors and Multicomputer.

Machine Instructions: Instructions and Instruction Sequencing, Addressing Modes.

Unit II:

Basic Processing Unit: Fundamental Concepts- Register Transfers, Performing Arithmetic, Logic Operations, Execution of a Complete Instruction, Multiple Bus Organization, Hardwired Control.

Microprogrammed Control: Microinstructions, Microprogram Sequencing, Microprogram Example, Design of Control Unit, Hardwired Control & Microprogrammed Control.

Unit III: Input Output organization: Peripheral devices, Standard I/O Interfaces, Accessing I/O Devices, Interrupts, Direct Memory Access and Buses.

Unit IV: Memory System: Basic Concepts, Semiconductor RAM Memory, Read-Only memory, Associative Memory, Cache Memory, Performance Considerations, Virtual Memory, Memory Management Requirements.

Unit V:

Pipelining: Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction sets, Data Path and Control Considerations, Super Scalar Operation, Performance Considerations.

Processor Family: Intel IA-64.

Learning Resources:

1. Carl.V Hamacher, Vranesic Z.G, Zaky S.G, Computer Organization, 5th Edition (2011), McGraw Hill.
2. M.Morris Mano, Computer System Architecture, 3rd Edition (2007), Pearson Education Asia.
3. William Stallings, Computer Organization & Architecture, 8th Edition (2011), Pearson Education Asia.
4. David A Patterson, John L Hennessy, Computer Organization and Design, 4th Edition (2014), Morgan Kaufmann.
5. Pal Chaudhuri.P, Computer Organization and Design, 3rd Edition (2009), Prentice Hall of India.
6. <http://nptel.ac.in/courses/106102157/>
7. <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-823-computer-system-architecture-fall-2005/>

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	:	1 Hour 30 Minutes			

With effect from the Academic Year 2020-21

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Mechanical Engineering

INTRODUCTION TO ENTREPRENEURSHIP

SYLLABUS FOR B.E.III-SEMESTER

L:T:P(Hrs/week):1:0:0	SEE Marks:40	Course Code: U19MC310ME
Credits :0	CIE Marks:30	Duration of SEE:02Hours

COURSE OBJECTIVE	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
The objective of this course is to inspire students to develop entrepreneurial mind-set, provide the information about the facilities, schemes available to start enterprise in India.	<ol style="list-style-type: none">1 demonstrate awareness about entrepreneurship and potentially be an entrepreneur.2 generate and analyse the business ideas3 know about the supporting organizations available to establish the business in the country4 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 generation, Sources of New Ideas, Techniques for generating ideas, Opportunity Recognition, Steps in tapping opportunities.

UNIT-II:

INSTITUTIONS SUPPORTING SMALL BUSINESS ENTERPRISES

Central level Institutions: NABARD, SIDBI, NIC, KVIC, NIESBUD, SIDO, DST, EDI, FICCI, CII, ASSOCHAM etc., State Level Institutions: DICs, SFC, SIDC, Other financial assistance.

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

Learning Resources:

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

Web Resources:

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

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

1	No. of Internal Tests	:	<input type="text" value="1"/>	Max. Marks for each Internal Test	:	<input type="text" value="20"/>
2	No. of Assignments	:	<input type="text" value="1"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3	No. of Quizzes	:	<input type="text" value="1"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Tests : 1 Hour 30 minutes

With effect from the Academic Year 2020-21

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

DATA STRUCTURES LAB

SYLLABUS FOR B.E. III-SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks : 50	Course Code: U19PC321CS
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
1 Design and analyze linear and nonlinear data structures	1 Implement insert, delete, search, sort and traverse operations on array and linked list
2 Acquire programming skills to implement sorting and searching techniques	2 Develop applications using stack and queue
3 Identify and apply the suitable data structure for the given real world problem	3 Apply nonlinear data structures to solve a problem
	4 Implement appropriate sorting technique for a given data set
	5 Implement hashing techniques to perform dictionary operations

Programming Exercise:

1. Implementation of Formula based representation.
2. Implementation of Singly Linked List, Doubly Linked List and Circular Linked List.
3. Implementation of Polynomial Arithmetic using Linked List.
4. Implementation of String Matching algorithms.
5. Implementation of Stacks, Queues.(Using both Arrays and Linked Lists)
6. Implementation of Infix to Postfix Conversion, Postfix Expression Evaluation.
7. Implementation of Recursive and Iterative Traversals on Binary Tree.
8. Implementation of Binary Search Tree.
9. Implementation of Operations on Binary Tree (Delete Entire Tree, Copy Entire Tree, Mirror Image, Level Order, Search for a Node etc.)
10. Implementation of Traversal on Graphs.
11. Implementation of Selection, Merge, Quick, Heap, and Insertion Sort.

12. Implementation of Binary Search and Hashing
13. Implementation of operations on AVL Trees.
14. Implementation of B-Trees.
15. Develop application using appropriate data structures.

Learning Resources:

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

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

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

OBJECT ORIENTED PROGRAMMING LAB

SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks: 50	Course Code: U19PC331CS
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
1 Implement object oriented system development using Java constructs 2 Develop robust Java application applying right data structures and streams .	1 Implement a use-case using OOP concepts 2 Develop applications using multi threaded programming 3 Implement I/O operations using console and file streams 4 Apply collection framework to implement a given scenario 5 Apply functional programming constructs

Programming Exercise:

1. A program to illustrate the concept of class with constructors, methods and overloading.
2. A program to illustrate the concept of inheritance and dynamic Polymorphism
A program to illustrate the usage of abstract class & Interface
3. A program to create Packages.
4. A program to illustrate Exception Handling.
5. A program to illustrate Thread Synchronization.
6. A program to work on strings using String classes.
7. A program to illustrate the usage of Filter and Buffered I/O streams
8. A program to demonstrate Serialization and Deserialization
9. A program using List & Set interfaces, Iterator & ListIterator
10. A program using Map interface, Date, Calendar & Timer.
11. A program to implement object comparison using comparator
12. A program to implement Lambda Functions

With effect from the Academic Year 2020-21

13. A program to implement Stream API
14. A program to demonstrate usage of Regular Expressions
15. A program to implement event handling using JFrame

Learning Resources:

1. Herbert Schildt, The Complete Reference Java, 10th Edition, Tata McGraw Hill 2018.
2. Joshua Bloch, Effective Java, 3rd Edition, Pearson, 2017
3. Timothy Budd, An introduction to Object-Oriented Programming, 3rd Edition, Pearson Education, 2008
4. Eric Freeman, Bert Bates, Kathy Sierra , Head First Design Patterns: A Brain-Friendly Guide, 1st Edition, O'Reilly, 2016
5. P. Radha Krishna, Object Oriented Programming through Java, Universities Press, 2007.
6. Sachin Malhotra, Saurabh Choudhary, Programming in Java, 2nd Edition, Oxford Press, 2014.
7. <https://docs.oracle.com/javase/tutorial/java>

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

OPEN ELECTIVES OFFERED BY CSE DEPARTMENTS IN

B.E. III SEMESTER (2020-21)

Dept	Title (Open Elective-I)	Code	credits
CIVIL	Green Buildings	U19OE310CE	2
CSE	Fundamentals of Scripting Language	U19OE310CS	2
CSE	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

With effect from the Academic Year 2020-21

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:
<ol style="list-style-type: none">1. Learn the principles of planning and orientation of buildings.2. Environmental implications of natural and building materials along with green cover3. Acquire knowledge on various aspects of green buildings	<ol style="list-style-type: none">1. Explain the principles of building planning, its bylaws and provide facilities for rainwater harvesting2. Relate safety to Green Technology3. Understand the concepts of green buildings4. Understand rating systems of GRIHA and LEED

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

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

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

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

Learning Resources:

1. Kumara Swamy N.Kameswara Rao A., Building Planning And Drawing, Charotar, Publications, 2013.
2. Shahane, V. S, "Planning and Designing Building", Poona, Allies Book Stall, 2004.
3. Michael Bauer, Peter Mösle and Michael Schwarz "Green Building – Guidebook for Sustainable Architecture" Springer, 2010.
4. Tom Woolley, Sam Kimmins, Paul Harrison and Rob Harrison "Green Building Handbook" Volume I, Spon Press, 2001.
5. Mili Majumdar, "Energy-efficient buildings in India" Tata Energy Research Institute, 2002.
6. TERI "Sustainable Building Design Manual- Volume I & II" Tata Energy Research Institute, 2009.

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

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

Duration of Internal Tests : 90 Minutes

With effect from the Academic Year 2020-21

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 5 Illustrate operations on Efficient Binary Search Trees and Multiway Search Trees.

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

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

Iteration: while statement

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

With effect from the Academic Year 2020-21

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

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

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

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

Learning Resources:

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

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

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

Duration of Internal Tests : 90 Minutes

With effect from the Academic Year 2020-21

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	<ol style="list-style-type: none">1 Explain the concepts of confidentiality, availability and integrity2 Explain the basics of fraud techniques used by a hacker3 Explore the common exploitation mechanisms and inspect data sniffing over the network4 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

With effect from the Academic Year 2020-21

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**

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
<ol style="list-style-type: none">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.	<p><i>On completion of the course, students will be able to</i></p> <ol style="list-style-type: none">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 versus Amplitude Modulation, Applications of FM.

UNIT – III

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

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

UNIT – IV

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

Learning Resources :

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

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

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

Duration of Internal Tests: 90 Minutes

With effect from the Academic Year 2020-21

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: U190E330EC
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<ol style="list-style-type: none">1. Acquire problem solving skills2. Write programs using Python language	<p><i>On completion of the course, students will be able to</i></p> <ol style="list-style-type: none">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	: 2	Max. Marks for each Internal Tests	: 30
2. No. of Assignments	: 2	Max. Marks for each Assignment	: 5
3. No. of Quizzes	: 2	Max. Marks for each Quiz Test	: 5

Duration of Internal Tests: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Non Conventional Energy Sources

Open Elective-I

SYLLABUS FOR B.E. III SEMESTER

L: T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code: 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.	<ol style="list-style-type: none">1. Demonstrate the generation of electricity from various Non-Conventional sources of energy and solar power generation2. Illustrate the generation of energy from wind and generation of energy from waste3. Demonstrate the generation of energy by biomass and fuel cells4. Illustrate the ocean and geo thermal energy generation

UNIT-I: Introduction and Solar Energy:

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

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

UNIT-II: Wind Energy and Waste to Energy:

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

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

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

Duration of Internal Tests :90 Minutes

With effect from the Academic Year 2020-21

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		

With effect from the Academic Year 2020-21
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**

With effect from the Academic Year 2020-21

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				

With effect from the Academic Year 2020-21

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.	<ol style="list-style-type: none">1. Identify appropriate linear data structure to solve a problem.2. Illustrate the usage of linked lists for various applications3. Demonstrate the usage of non-linear data structures – graphs & trees

UNIT – I: Introduction to Data Structures: Performance Analysis: Time and Space complexity.

Introduction to Data Structures: Stacks, Representation of a Stacks using Arrays, Applications.

Queues: Representation of a Queue using array ,Applications.

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

With effect from the Academic Year 2020-21

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.	<ol style="list-style-type: none">1. Install Linux operating system and use desktop environment.2. Identify and use Linux utilities to create and manage simple file processing operations.3. Organize directory structures with appropriate security.4. Configure and use Linux shell.

UNIT – I:

Introduction to Linux, Installing Linux, Running Linux from USB Drive, Understanding X Windows System and Desktop, Navigating through 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)
SCHEME OF INSTRUCTION AND EXAMINATION (R-19)B.E 2019-20 ADMITTED BATCH
B.E. – COMPUTER SCIENCE & ENGINEERING : IV SEMESTER (2020 - 2021)

B.E (CSE) IV Semester								
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
THEORY								
U19HS430EH	Skill Development - II : Communication Skills in English	2	-	-	3	60	40	2
U19PC410CS	Microprocessors, Microcontroller & Interfacing	3	-	-	3	60	40	3
U19PC420CS	Operating Systems	3	-	-	3	60	40	3
U19PC430CS	Design & Analysis of Algorithms	3	-	-	3	60	40	3
U19PC440CS	Automata, Languages and Computation	3	-	-	3	60	40	3
U19OE4XXXX	Open Elective-II	3	-	-	3	60	40	3
U19MC010CE	Environmental Science	2	-	-	3	60	40	0
PRACTICALS								
U19PC411CS	Microprocessors, Microcontroller & Interfacing Lab	-	-	2	3	50	30	1
U19PC421CS	Operating Systems Lab	-	-	2	3	50	30	1
U19PC431CS	Design & Analysis of Algorithms Lab	-	-	2	3	50	30	1
U19PW419CS	Mini Project-I	-	-	2	-	-	30	1
TOTAL		19	-	8	-	570	400	21
GRAND TOTAL		27			-	970		-
Student should acquire one online course certification equivalent to two credits during III Sem to VII Sem								
Left over hours are allocated for Extra Curricular Activities, Co-Curricular Activities, Sports / Library / Mentor Interaction / CC / RC / TC								

With effect from the Academic Year 2020-21

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

Department of Humanities and Social Sciences
Skill Development - II : Communication Skills in English

SYLLABUS FOR B. E -IV SEMESTER
(COMMON FOR ALL BRANCHES)

L:T : P(Hrs/Week):2:0:0	SEE Marks : 60	Course Code: U19HS430EH
Credits: 2	CIE Marks : 40	Duration of SEE: 3 Hours

Course Overview:

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

Course Objective:

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

Overview of the delivery Methodology:

- 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 : Max. Marks for each Internal Test :

2 No. of Assignments : Max. Marks for each Assignment :

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

Duration of Internal Tests : 90 minutes

With effect from the Academic Year 2020-21

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

MICROPROCESSORS, MICROCONTROLLER & INTERFACING

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code :U19PC410CS
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 Explain the architecture of 8086 microprocessor, 8051 microcontroller and ARM processor	1 Explain the architecture, addressing modes and instruction set of 8086 microprocessor
2 Write assembly language programs to interface I/O devices with processor and controller	2 Explain interrupt handling mechanisms of 8086 microprocessor
	3 Interface analog and digital I/O devices with 8086 microprocessor
	4 Write assembly language programs using instruction set of 8051 and ARM controller
	5 Write programs to interface 8051 microcontroller with I/O devices such as keyboard and stepper motor

UNIT-I:

Microprocessor: Introduction, Overview of Micro computer structure and Operation, Microprocessor Evolution and Types, 8086 Internal Architecture, Pin Configuration, Minimum and Maximum mode, addressing modes, Instruction set, Programming the 8086, Accessing Data in Memory.

UNIT-II: Implementing standard program structures in 8086, Strings, Procedures and Macros, Assembler directives, Interrupts and Interrupt Applications, Hardware and software interrupt applications, Interrupt examples.

UNIT-III:

Digital Interfacing: Programmable Parallel Ports and Handshake Input/Output, Keyboard and display Controller(8279)Interfacing, Programmable Interrupt Controller(8259),Interfacing to Alpha Numeric Displays, Interfacing LCD displays.

Analog Interfacing – A/D & D/A interfacing, DMA Controller(8257), Dynamic RAMs.

UNIT-IV: Introduction to Microcontrollers, 8051 Architecture, Instruction set, Addressing modes and Programming techniques. Comparison of various families of 8-bit micro controllers, System Design Techniques.

UNIT-V: Interfacing of LCD, ADC, Sensors, Stepper motor, keyboard and DAC using 8051 microcontrollers.

ARM Processor: Introduction, Processor and Memory Organization, Data Operations, Flow of Control.

Case studies: Case study on Home protection system, Case study on closed loop DC motor speed control system.

Learning Resources:

1. Douglas V. Hall, Microprocessors and Interfacing, 2ndEdition (2006), McGraw Hill.
2. Kenneth J. Ayala, The 8051 Microcontroller Architecture, Programming and Application, Penram International (2007)
3. Marilyn Wolf, Computers as Components: Principles of Embedded Computing System Design, 3rd Edition (2012), Elsevier Morgan Kauffmann Publishers.
4. Yu-cheng Liu, Glenn A. Gibson, Microcomputer Systems The 8086/8088 Family - Architecture, Programming and Design 2ndEdition (2011)
5. Barry B. Brey, The Intel Microprocessor, 8086/8088,80186/80188, 80286, 80386, 80486, Pentium and Pentium pro-processors – Architecture, Programming and interfacing, 8thEdition (2013), Prentice Hall.
6. Ray A.K & Bhurchandhi K.M, Advanced Microprocessor and Peripherals,2ndEdition(2007),TMH.
7. K. Shibu, Introduction to Embedded Systems, (2009), Paperback.
8. Speed Control of 2-pole DC Motor Using Pwm PROTEUS VSM 7.9 & AVR STUDIO (SOFTWARE)By IJSTE - International Journal of Science Technology and Engineering.
9. <http://nptel.ac.in/courses/108107029/>

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 : 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

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

Department of Computer Science & Engineering
OPERATING SYSTEMS

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks: 60	Course Code: U19PC420CS
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 Operating system Structures, Services and threading models	1 Explain Operating system structures and compare CPU scheduling algorithms
2 Learn operating system services by considering case studies such as Linux, Windows and Android	2 Apply contiguous & non-contiguous techniques for main memory management and explain file system implementation
	3 Design solutions for classical synchronization problems and describe deadlock handling methods
	4 Explain device management and I/O operation implementation techniques
	5 Apply Access matrix for system protection. Describe the features of Linux, Windows and Android Operating systems

UNIT-I:

Introduction to operating systems: Definition, User view and System view of the Operating system, Computer- system organization, Computer-system architecture, Operating system structure, Operating system operations, Operating system services, System calls

Process: Process concept, Process Scheduling, Operations on process, Inter-process communication, Threads, Multithreading Models, Multicore programming.

CPU Scheduling: Scheduling Criteria, Scheduling Algorithms, Multiprocessor scheduling.

UNIT-II:

Memory Management: Swapping, Contiguous memory allocation, Paging, Segmentation, Structure of the page table.

Virtual memory: Demand paging, Page replacement Algorithms, Thrashing.

File System Interface: File Concept, Access Methods, Directory and Disk Structure

File System Implementation: File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free Space management.

UNIT –III:

Process synchronization: The critical Section problem, Peterson's solution, Synchronization Hardware, Semaphores, Classic problems of Synchronization, Monitors.

Deadlocks: System model, deadlock characterization, Methods for handling deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from deadlock.

UNIT –IV:

Device Management: Disk Structure, Disk Attachment, Disk Scheduling, Disk Management, Swap Space Management, RAID structure.

I/O System: I/O hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O request to hardware operation.

UNIT-V:

Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix, Implementation of Access matrix

Case Studies: Linux System: Design Principles, Kernel Modules, Process Management, Scheduling

Windows - Design Principles, System components ,File system

Android: Architecture, Activity and Service life cycle.

Learning Resources:

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, *Operating System Concepts*, 9th Edition (2016), Wiley India.
2. Andrew S. Tanenbaum, *Modern Operating Systems*, 2nd Edition (2001), Pearson Education, Asia.
3. Dhananjay, Dhamdhare.M, *Operating System-concept based approach*, 3rd edition (2009), Tata McGraw Hill, Asia
4. Robert Love: *Linux Kernel Development*, (2004)Pearson Education
5. Richard Stevens, Stephen Rago, *Advanced Programming in the UNIX Environment*, 3rd Edition(2013), Pearson Education
6. <http://web.stanford.edu/~ouster/cgi-bin/cs140-spring19/index.php>
7. <https://nptel.ac.in/courses/106106144/>

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 : 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

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

Department of Computer Science & Engineering
DESIGN AND ANALYSIS OF ALGORITHMS

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week):3:0:0	SEE Marks : 60	Course Code: U19PC430CS
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 Analyze the asymptotic performance of algorithms 2 Apply algorithm design strategies to solve science and engineering problems.	1 Compare asymptotic behavior of functions derived from algorithms 2 Apply divide & conquer and greedy algorithmic design paradigms to solve problems 3 Design algorithms using Dynamic Programming strategy 4 Design algorithms for problems using backtracking and branch & bound algorithm design techniques 5 Identify the complexity class of a given problem

UNIT – I:

Introduction: Introduction to Algorithm, algorithm specification.

Performance analysis: space complexity, time complexity. Asymptotic notations, amortized analysis

UNIT – II:

Divide and Conquer: General method, binary search, finding maximum and minimum, Merge sort, quick sort, performance measurement, Masters theorem.

The Greedy Method: The general method, Knapsack problem, Job sequencing with deadlines, minimum cost spanning trees, optimal Storage on Tapes, Optimal Merge Patterns, single Source Shortest Paths, network flows.

UNIT – III: Dynamic Programming: the general method, matrix-chain multiplication problem, multistage graph, All Pairs Shortest Paths, Optimal Binary Search Trees (OBST), 0/1 Knapsack, Reliability Design, Traveling Salesman Problem, Bi-connected Components and DFS, Longest Common Subsequence (LCS) problem.

UNIT – IV:

Backtracking: General method, the 8-Queens Problem, Graph Coloring, Hamiltonian Cycles, Knapsack Problem.

Branch and Bound: The method, 0/1 Knapsack problem, Traveling Salesperson problem.

UNIT – V: NP-Hard and NP-Complete problems: Tractable and intractable problems, Non-Deterministic search and sorting, classes P, NP, NP-Complete, NP-Hard, Satisfiability (SAT), Cook's theorem, reductions, procedure for NP-Complete, clique decision problem, graph coloring, node cover, Hamiltonian cycle, TSP.

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.
3. Michael T. Goodrich, Roberto Tamassia, Algorithm Design, foundations, analysis, and internet examples, WILEY student edition (2006).
4. Aho, Hopcroft, Ulman, The Design and Analysis of Computer Algorithms, (2000), Pearson Education.
5. Steven S. Skiena, The Algorithm Design Manual, Springer (1997).
6. Algorithm Design, 1st Edition, Jon Kleinberg and Éva Tardos, Pearson.
7. <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-046j-design-and-analysis-of-algorithms-spring-2015/index.htm>.
8. <http://openclassroom.stanford.edu/MainFolder/CoursePage.php?course=IntroToAlgorithms>
9. <http://nptel.ac.in/courses/106101060/>

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 : 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

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

Department of Computer Science & Engineering
AUTOMATA, LANGUAGES AND COMPUTATION

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : U19PC440CS
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 relationships among machines, languages and computational problems.	1 Design Finite Automata for Regular Languages.
2 Design abstract models for formal languages.	2 Apply formal mathematical methods to prove properties of languages, grammars and Automata.
3 Determine the decidability of computational problems.	3 Analyze the language and Design pushdown automata. 4 Design Turing machines for simple problems. 5 Describe and determine the Undecidability of a problem.

UNIT-I:

Automata: Introduction to Finite Automata, Central Concepts of Automata Theory.

Finite Automata: An Informal Picture of Finite Automata, Deterministic Finite Automata, Nondeterministic Finite Automata, An application, Finite Automata with Epsilon Transitions. Simulation of Finite Automata using JFLAP tool.

Regular Expressions and Languages: Regular Expressions, Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic Laws for Regular Expressions.

UNIT – II:

Properties of Regular Languages: Proving Languages not to be Regular, Closure properties of Regular Languages, Decision Properties of Regular Languages, Equivalence and Minimization of Automata.

Context Free Grammars and Languages: Context-Free Grammars, Parse Trees, Applications of CFG's, Ambiguity in Grammars and Languages.

UNIT – III:

Pushdown Automata: Definition, Languages of a PDA, Equivalence of PDA's and CFG's, Deterministic Pushdown Automata. Simulation of Pushdown Automata using JFLAP tool.

Properties of Context Free Languages: Normal Forms for Context-Free Grammars, Pumping Lemma for CFL's, Closure properties, Decision Properties of CFL's.

UNIT – IV:

Linear Bounded Automata: Context sensitive grammars and languages, Linear bounded automata.

Introduction to Turing Machines: Problems That Computers cannot Solve, The Turing Machine, Programming Techniques for Turing Machines, Extensions to the Basic Turing Machine, Restricted Turing Machines, Turing Machines and Computers. Simulation of Turing Machine using JFLAP tool

UNIT – V:

Undecidability: A Language that is not Recursively Enumerable, An undecidable Problem that is RE, Undecidable problems about Turing Machines, Post's Correspondence Problem, Other Undecidable Problems.

Intractable Problems: The Classes P and NP, An NP-Complete Problem, A Restricted Satisfiability Problem

Learning Resources:

1. John. E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Introduction to Automata Theory, Languages and Computation, 3rd edition (2009), Pearson Education.
2. John C.Martin, Introduction to Languages and the Theory of Computation, 3rd Edition (2003) Tata McGraw Hill.
3. Bernard M.Moret, The Theory of Computation (2002), Pearson Education.
4. Michael Sipser, Introduction to Theory of Computation, 3rd Edition (2012), Course Technology.
5. Mishra and Chandrashekar, 'Theory of computer science - Automata, Languages and Computation', 2nd Edition, PHI
6. Zvikohavi , Switching and finite Automata Theory,3rd Edition (1976),TMH.
7. <http://www.nptelvideos.in/2012/11/theory-of-computation.html>
8. <http://nptel.ac.in/courses/106106049/>

With effect from the Academic Year 2020-21

9. <http://user.it.uu.se/~pierref/courses/FLAT/>
10. <http://www.eecs.wsu.edu/~ananth/CptS317/Lectures/>
11. <http://www.ics.uci.edu/~goodrich/teach/cs162/notes/>

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 : 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

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 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>Upon the completion of this course students will be able to</i>
<ol style="list-style-type: none">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.	<ol style="list-style-type: none">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 ecosystems, 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:

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

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

1	No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Test	:	<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 : 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

MICROPROCESSORS, MICROCONTROLLER & INTERFACING LAB

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week): :0:2	SEE Marks : 50	Course Code: U19PC411CS
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>
<ol style="list-style-type: none">1 Implement assembly language programs in 8086 microprocessor, 8051 and ARM controller.2 Interface I/O devices to Microprocessor and Microcontroller.	<ol style="list-style-type: none">1 Implement programs using instruction set of 8086 microprocessor.2 Implement programs using macros and sub routines in 8086 microprocessor.3 Develop an application to interface I/O devices with 8086 microprocessor.4 Develop an application to interface I/O devices using 8051 microcontroller.5 Implement assembly language programs using ARM processor.

8086 PROGRAMMING USING MICROPROCESSOR TRAINER KIT

1. Execution of basic programs on 8086Microprocessor.
2. Programs using different addressing modes.
3. Programs using single byte, multi byte, binary, BCD addition and subtraction.
4. Programs on searching and sorting.
5. Generation of waveforms using DAC interface.
6. Interfacing and programming of 8255. (E.g. traffic light controller).
7. Interfacing keypad/display unit.

8051 PROGRAMMING

8. Execution of basic programs on 8051 Microcontroller.
9. Programs on searching and sorting.
10. Interfacing Stepper Motor.
11. Interfacing LCD Display.
12. Interfacing Keypad.
13. Execution of basic programs using ARM Processor
14. ARM's Barrel Shifter program

Learning Resources:

1. Douglas V. Hall, Microprocessors and Interfacing, 2ndEdition (2006), McGraw Hill.
2. Kenneth J. Ayala, "The 8051 Microcontroller Architecture, Programming and Application", Penram International (2007)
3. Marilyn Wolf, Computers as Components: Principles of Embedded Computing System Design, 3rd Edition (2012), Elsevier Morgan Kauffmann Publishers.
4. Yu-cheng Liu, Glenn A. Gibson, Microcomputer Systems The 8086/8088 Family - Architecture, Programming and Design 2ndEdition (2011)
5. Barry B. Brey, The Intel Microprocessor, 8086/8088,80186/80188, 80286, 80386, 80486, Pentium and Pentium pro-processors – Architecture, Programming and interfacing, 8thEdition (2013), Prentice Hall.
6. Ray A.K & Bhurchandhi K.M, Advanced Microprocessor and Peripherals,2ndEdition (2007),TMH.
7. <http://nptel.ac.in/courses/108107029/>

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

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

Department of Computer Science & Engineering
OPERATING SYSTEMS LAB

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week):0:0:2	SEE Marks : 50	Course Code: U19PC421CS
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
1 Apply system calls for process management and file management	1 Implement operations on Files and Process by using system calls
2 Implement techniques related to CPU Scheduling, Main memory management, Process synchronization and deadlock avoidance & detection	2 Implement CPU Scheduling methods 3 Implement Contiguous memory allocation techniques and Page Replacement techniques 4 Design and implement solutions for Inter-Process Communication 5 Implement deadlock handling techniques

Programming Exercise:

1. Implement system calls for
 - i) File system management
 - ii) Process management
2. Implementation of CPU scheduling algorithms (FCSF, SJF, Priority, RR, Multi level)
3. Implement contiguous Memory management techniques
 - i) Best Fit
 - ii) Worst Fit
 - iii) First Fit
4. Implementation of Page Replacement algorithms

- a) FIFO
- b) LRU
- c) OPTIMAL
- 5. Implement Inter-process communication using
 - i) Pipes
 - ii) Message Queues
 - iii) Shared Memory
- 6. Implementation of Process Synchronization for Bounded buffer, Readers-Writers and Dining philosophers problems
- 7. Implementation of Deadlock handling
 - i) Resource Allocation Graph
 - ii) Safety Algorithm
 - iii) Resource Request algorithm
 - iv) Wait for graph
- 8. Implementation of Disk Scheduling algorithms a) FCFS b) SSTF c) SCAN
- 9. Build a real operating system kernel by using an open source operating system (Linux) kernel to implement services such as Process Scheduling, Process synchronization, Virtual memory and File system

Learning Resources:

- 1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, *Operating System Concepts*, 9th Edition (2016), Wiley India.
- 2. Andrew S. Tanenbaum, *Modern Operating Systems*, 2nd Edition (2001), Pearson Education, Asia.
- 3. Dhananjay, Dhamdhere.M, *Operating System-concept based approach*, 3rd edition (2009), Tata McGraw Hill, Asia
- 4. Robert Love: *Linux Kernel Development*, (2004)Pearson Education
- 5. Richard Stevens, Stephen Rago, *Advanced Programming in the UNIX Environment*, 3rd Edition(2013), Pearson Education
- 6. <http://web.stanford.edu/~ouster/cgi-bin/cs140-spring19/index.php>
- 7. <https://nptel.ac.in/courses/106106144/>

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

With effect from the Academic Year 2020-21

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

DESIGN & ANALYSIS OF ALGORITHMS LAB

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week):0:0:2	SEE Marks : 50	Course Code : U19PC431CS
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
1 Implement solutions for the given problems using divide and conquer	1 Implement searching, sorting and hashing using basic data structures.
2 Implement solutions for the given problems using greedy and dynamic programming	2 Apply divide and conquer strategy to implement algorithm for a given problem.
3 Implement solutions for the given problems using backtracking and branch and bound.	3 Implement an algorithm for a given problem using Greedy design strategy
	4 Apply dynamic programming to implement algorithms for a set of problems.
	5 Implement algorithms for set of problems using backtracking and branch and bound.

Programming Exercise:

1. Implementation of Merge Sort, Quick Sort, Heap Sort, Binary Search and Hashing.
2. Implementation of Traversal on Graphs.
3. Implementation of Traversal on Trees and DAG.
4. Implement Single source shortest path algorithm.
5. Implement Minimum cost spanning tree algorithm.
6. Implement fractional Knapsack algorithm.
7. Implement Optimal merge patterns -Huffman encoding algorithm.
8. Implement Matrix-chain multiplication algorithm with dynamic programming.

With effect from the Academic Year 2020-21

9. Implement LCS algorithm and print Longest common subsequence.
10. Implement All-pairs shortest path algorithm.
11. Implement 0/1 Knapsack algorithm.
12. Implement multi-stage graph.
13. Implementation of N-queens problem with back tracking.
14. Implement Graph coloring problem with back tracking.
15. Implement TSP by branch and bound.
16. Implement 0/1 knapsack by branch and bound.

Learning Resources:

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

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

With effect from the Academic Year 2020-21

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

Department of Computer Science & Engineering
MINI PROJECT-I

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : --	Course Code :U19PW419CS
Credits : 1	CIE Marks : 30	Duration of SEE : --

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
1 Develop an application in the relevant area of Computer Science.	1 Review the literature survey to identify the problem.
2 Learn contemporary technologies.	2 Design a model to address the proposed problem.
	3 Develop and test the solution.
	4 Demonstrate the work done in the project through presentation and documentation.
	5 Adapt to contemporary technologies.

The students are required to carry out mini projects in any areas such as Data Structures, Microprocessors & interfacing, Database Management Systems, Operating Systems and Design & Analysis of Algorithms.

Students are required to submit a report on the mini project at the end of the semester.

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

Dept	Title Open Electives-II	Code	credits
CIVIL	Disaster Management	U19OE410CE	3
CSE	Introduction to Data Structures	U19OE410CS	3
CSE	Introduction to Software Engineering	U19OE420CS	3
ECE	Introduction to Communication Systems	U18OE420EC	3
Mech	Optimization Methods	U19OE410ME	3
IT	Introduction to Object Oriented Programming	U19OE410IT	3
	Introduction to Scripting Languages	U19OE420IT	3
H&SS	Critical Thinking	OE410EH	3

With effect from the Academic Year 2020-21

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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
<i>Objectives of this course are to:</i>	<i>Upon the completion of this course the students will be expected to:</i>
<ol style="list-style-type: none">1. Know about the state of art of disaster management in world and explore the history of the disasters and comprehend how past events have helped shape the future.2. Study the various natural and manmade disasters and apply the mitigation measures3. Expose students to various technologies used for disaster mitigation and management.	<ol style="list-style-type: none">1. Attain knowledge on various types, stages, phases in disaster with international & national policies and programmes with reference to the disaster reduction.2. Understand various types of natural disaster, their occurrence, Effects, Mitigation and Management Systems in India3. Understand different types of manmade disasters, their occurrence, Effects, Mitigation and Management Systems in India.4. Explain the utility of geography information systems (GIS), Remote sensing technology in all phases of disaster mitigation and management.5. Understand the Role of Remote Sensing and Geographical Information Systems (GIS) in Disaster Management

UNIT-I

Introduction: Hazard, vulnerability and risk, Types of disasters, Disaster management cycle, Progress of disaster management in

world, vulnerability profile of India, Disaster management act, Disaster management in India

UNIT-II

Natural Disasters – Hydro- meteorological based disasters:

Tropical cyclones, floods, drought and desertification zones - Causes, Types, effects and Mitigation measures.

UNIT-III

Natural Disasters – Geographical based disasters:

Earthquake, Tsunamis, Landslides and avalanches – Causes, Types, effects and Mitigation measures.

UNIT-IV

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

UNIT-V

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

Suggested Books:

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:	02	Max.Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05
Duration of Internal Test: 90 Minutes				

With effect from the Academic Year 2020-21

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

UNIT – I:

Arrays: Arrays - ADT, Polynomials, Sparse matrices,

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

UNIT – II :

Stacks: Array Representation, Linked Representation, Applications.

Queues: Array Representation, Linked Representation, Applications.

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

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

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

Learning Resources:

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

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

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

Duration of Internal Tests : 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

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

UNIT-I:

Introduction to Software Engineering:

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

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

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

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

UNIT-III:

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

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

UNIT-IV:

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

Architectural Modelling: Artifacts, Artifact diagrams, Deployment diagrams.

UNIT-V:

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

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

Learning Resources:

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

2 No. of Assignments : Max. Marks for each Assignment :

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

Duration of Internal Tests : 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

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: U18OE420EC
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<ol style="list-style-type: none">1. Distinguish between Amplitude and Frequency modulation methods and their application in Communication Receivers2. Explain why multiplexing methods are necessary in communications and compare FDM with TDM3. Compare and contrast FSK and BPSK modulation schemes employed in digital data transmission4. Draw the block diagrams of different types of communication systems and explain their operation	<p>On completion of the course, students will be able to</p> <ol style="list-style-type: none">1. Identify the Radio frequency spectrum and the bands of different types of radio systems2. 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 systems5. Detect and correct errors present in bit stream data using parity check6. Explain the basic principles of different types of communication systems.

UNIT - I :

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

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

Domain, AM Power

UNIT - II :

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

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

UNIT - III :

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

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

UNIT - IV :

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

UNIT - V :

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

Learning Resources:

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

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

- | | | | |
|----------------------------|--------------------------------|-------------------------------------|---------------------------------|
| 1. No. of Internal Tests : | <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

With effect from the Academic Year 2020-21

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
The objectives of this course are to: understand Linear & non-linear programming, transportation modeling , CPM & PERT for project scheduling and control, and application of various optimization techniques for respective field engineering (Inter disciplinary)	On completion of the course, the student will be able to: <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. Paneerselvam, "Operations Research", PHI Learning Pvt Ltd., 2009.
5. Kalyanmoy Deb, Optimization for Engineering Design- algorithms and examples, PHI pvt ltd, 1st edition 2003, Delhi.

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

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

Duration of Internal Test: 1 Hour 30 Minutes

With effect from the Academic Year 2020-21

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.	<ol style="list-style-type: none">1. Understand fundamental concepts in Object oriented approach.2. Develop object-oriented programs using the concepts of exception handling and multi threading.3. Demonstrate the usage of Java I/O streams to handle user input and output.4. Design and develop GUI programs.5. Develop Applets for web applications.

UNIT- I

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

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

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

Interfaces: Defining interfaces, extending interfaces, implementing interfaces.

UNIT- II

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

UNIT- III

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

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

UNIT- IV

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

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

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

UNIT- V

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

Learning Resources:

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

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

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

With effect from the Academic Year 2020-21

With effect from Academic Year 2020-21 (R19)

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 :U190E420IT
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 constructs2. Write a python script to solve a basic problem using object oriented programming constructs3. Create and use python modules4. Handle file related operations5. 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)

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

OPEN ELECTIVE B.E.- IV Semester

CRITICAL THINKING

Instruction : 3 Hours	SEE : 60	Course code : OE410EH
Credits : 3	CIE : 40	Duration of SEE : 3 Hours

<p>Course Objectives 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 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
--	---

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
Presentations
Expert lectures

ASSESSMENT :-

Online assignments
Individual and Group

Writing and Audio-visual lessons

Learning Resources:-

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

With effect from the Academic Year 2020-21

The break-up of marks for CIE:

Internal Tests (2); Quiz Tests (3) + Assignments (3)

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

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

2. No. of Assignments : Max. Marks for each Assignment :

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

Duration of Internal Tests: 90 Minutes

Duration of Internal Tests : 90 minutes