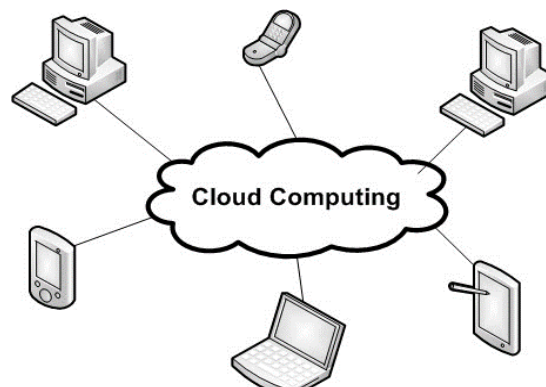# VASAVI COLLEGE OF ENGINEERING
(Autonomous)
IBRAHIMBAGH, HYDERABAD-500 031

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. (IT) III and IV Semesters with effect from 2019-2020
(For the batch admitted in 2018-19)
(R-18)

DEPARTMENT OF INFORMATION TECHNOLOGY
+91-40-23146050, 23146051
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VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION (R-18)
B.E. – INFORMATION TECHNOLOGY : THIRD SEMESTER (2019 - 2020)

Course Code	Course Name	Scheme of Instruction			Scheme of Examination			Credits
		Hours per week			Duration in Hrs	Maximum Marks		
		L	T	P/D		SEE	CIE	
U18HS330EH	Skill Development-I : Communication Skills in English	2	-	-	3	60	40	2
U18BS340MA	Discrete Mathematics	3	-	-	3	60	40	3
U18ES310IT	Basic Electronics	3	-	-	3	60	40	3
U18ES320IT	Digital Electronics and Logic Design	3	-	-	3	60	40	3
U18PC310IT	Advanced Data Structures	2	-	-	3	60	40	2
U18PC320IT	Object Oriented Programming	3	-	-	3	60	40	3
U18OE3XXXX	Open Elective – I	2	-	-	3	60	40	2
U18MC010CE	Environmental Science	2	-	-	3	60	40	0
U18MC310ME	Introduction to Entrepreneurship	1	-	-	2	40	30	0
PRACTICALS								
U18ES311IT	Basic Electronics Lab	-	-	2	3	50	30	1
U18PC311IT	Advanced Data Structures Lab	-	-	2	3	50	30	1
U18PC321IT	Object Oriented Programming Lab	-	-	2	3	50	30	1
Student should complete one online certificate course during III-VIII Semester.								
Total		**21**	**-**	**6**	**-**	**670**	**440**	**21**
Grand Total		**27**		**-**		**1110**		

Note:

1. One hour is allotted to Library / Sports / Proctorial Interaction.
2. The left over hours are to be allotted to ECA–I / CCA-I / RC / CC / TC based on the requirement .

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

SKILL DEVELOPMENT-I: COMMUNICATION SKILLS IN ENGLISH
SYLLABUS FOR BE 2/4-III SEMESTER
(COMMON FOR ALL BRANCHES)

L:T:P(Hrs/Week):2:0:0	SEE Marks : 60	Course Code: **UI8HS330EH**
Credits: 2	CIE Marks : 40	Duration of SEE : Hours : 03

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

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

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

Unit1 – Fundamentals of Communication

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

Learning Outcome:
The students should be able to:
Respond to questions
Engage in informal conversations.
Speak appropriately in formal situations
Write formal and informal emails/letters

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

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

Unit 2 - Narrations and Dialogues

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

Learning Outcome:
The students should be able to

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

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

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

Unit 3 - Rational Recap

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

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

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

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

Unit 4: Technical Expositions and Discussions

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

Learning Outcome:
The students should be able to:
- Participate in technical and forum discussions by providing factual information, possible solutions, and examples.

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

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

Unit 5: Drawing Conclusions

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

Learning Outcome:
Students should be able to:
- Provide logical conclusions to the topics under discussion.
- Prepare, present, and analyze reports.

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

Sessions:
1. Reasoning
2. Analyzing
3. Generalization and Prediction

Students are given workbooks prepared by Talent sprint.

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

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

Duration of Internal Tests   : 90 Minutes

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

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

L:T: P(Hrs/week):3:0:0	SEE Marks: 60	Course Code : **U19BS340MA**
Credits :3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
1. **Understand** Propositions and their equivalences, predicates and quantifiers and learn various proof strategies.	1. **Use** logical notation to define and reason about fundamental mathematical concepts and synthesize induction hypothesis and simple Induction proofs.
2. **Study** the concepts of number theory such Modular Arithmetic, Congruences and basic cryptography etc.,	2. **Prove** elementary properties of modular arithmetic and basic cryptography and apply in Computer Science.
3. **Understand** the basics of counting, combinatory, and various methods of solving Recurrence relations.	3. **Calculate** number of possible outcomes of elementary combinatorial processes such as permutations and combinations Model and analyze computational processes using analytic and Combinatorial methods.
4. **Understand** Relations, Equivalence relations, Posets and Hasse diagrams.	4. **Prove** whether a given relation is an equivalence relation/poset and will be able to draw a Hasse diagram.
5. **Analyze** the concepts of Graphs.	

UNIT-I:
Logic: Logic- Logical connectives- Propositional equivalences– Predicates and quantifiers – Nested quantifiers.
Mathematical Reasoning, Induction: Proof Strategy- Methods of Proofs- Mathematical Induction- Second Principle of Mathematical Induction.
UNIT-II
Number Theory: The Integers and Division- Division Algorithm- Fundamental Theorem of Arithmetic –Modular Arithmetic-Integers and Algorithms- Euclidean Algorithm. Applications of Number Theory-Linear Congruences- The Chinese Remainder Theorem (without Proof)- Fermat's Little Theorem- Public key cryptography- RSA Encryption and Decryption.
UNIT-III:
Counting: Basics of counting- Pigeonhole principle- Permutations and combinations – Pascal's Identity- Vandermonde's Identity- Generalized Permutations and combinations.
Advanced Counting Techniques: Recurrence relations: Solving Recurrence Relations- Linear Homogeneous and Non-Homogeneous Recurrence relations.
UNIT-IV:
Relations: Relations – Properties -Representing relations - Equivalence Relations - Partial Orderings- Poset- Hasse diagrams – Maximal & Minimal Elements.
UNIT-V:
Graph Theory: Introduction- Types of graphs- Graph terminology- Basic theorems- Representing Graphs and Graph Isomorphism - Connectivity- Euler and Hamiltonian paths - Planar graphs- Euler's Formula- Graph coloring- Basic Definitions.

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

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

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

Duration of Internal Tests   : 90   Minutes

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

BASIC ELECTRONICS
SYLLABUS FOR III-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code : **U18ES310IT**
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
Identify different electronic devices, their characteristics and use them in building simple electronic circuits.	1. Design simple circuits like rectifiers, voltage regulators, clipping and clamping circuits for the given specifications based on the operating principles of the diode. 2. Analyze different bipolar junction transistor circuits to determine Input impedance, output impedance, Voltage gain, current gain using exact and approximate h parameter models. 3. Verify the implementation of simple Boolean functions using CMOS circuits with the help of Truth table indicating the different transistors ON/OFF conditions. 4. Determine the kind of feedback used in a given negative feedback amplifier circuit and determine the frequency of oscillation of Hartley, Colpitt and RC phase shift oscillators. 5. Analyze simple operational amplifier circuits to determine the voltages at specific points in the circuit and design simple operational amplifier circuits for given application.

UNIT – I: Diodes:
PN junction diode, Biasing, Zener diodes, Rectifier Circuits, Limiting and clamping circuits, Schottky Barrier diode and Varactor diode.

UNIT – II: Bipolar Junction Transistors:
Bipolar junction transistors –characteristics, analysis of transistor circuits at DC, biasing, transistor as amplifier, effect of emitter bypass capacitance, h-parameter model of BJT, approximate analysis of BJT circuits using h-parameter model, transistor as switch, internal capacitance. Pi equivalent circuit, low frequency and high frequency operation, thermal run away

UNIT – III: Field Effect Transistors:
MOSFET current-voltage characteristics, MOSFET as an amplifier and as a switch, Digital CMOS logic circuits: Introduction, digital IC technologies and logic circuit families, Voltage Transfer Characteristic (VTC) of inverter, Noise Margins, Propagation delay, static and dynamic operation of CMOS inverter. CMOS logic gate circuits: Basic structure (PUN and PDN), Implementation of 2-input NOR gate, NAND gate, complex gates and exclusive OR gate.

UNIT – IV: Feedback Amplifiers and oscillators
Feedback – Structure, Properties of negative feedback, Topologies, Advantages of negative feedback amplifiers Sinusoidal Oscillators – Loop gain, Barkhausen criteria, RC Phase shift, LC and Crystal Oscillators.
Power Amplifiers: class A, B and C amplifiers.

UNIT – V: Operational Amplifiers:
Operational Amplifiers: Ideal characteristics, op. amp. as adder, Subtractor, Integrator, differentiator and comparator using op. amp. generation of square and Triangular waveforms, Monostable multi vibrator.
Op. Amp. As Voltage –controlled current switch(VCCS), Current-controlled Voltage source(CCVS), Instrumentation Amplifier, antilogarithmic amplifiers and analog multipliers.

<u>**Learning Resources :**</u>
1. Jacob Millman, Christos C Halkais, Satybrata jit, Electronic Devices and Circuits,Mc Graw Hill India Private Ltd, 3rd Edition
2. Adel S. Sedra, Kenneth C. Smith, Microelectronic Circuits, 5th Edition, Oxford International Student Edition, 2006
3. D. Roy Choudhury, Shail B. Jain, Linear Integrated Circuits, New Age International Publishers, 4th Edition.
4. Jocob Millman, Arvin grable–Micro Electronics – 2nd Edition, McGraw Hill 1987.
5. Donald L. Schilling, Charles Belove, Electronic Circuits Discrete and Integrated, Tata Mc Graw Hill Education, 3rd Edition
6. https://nptel.ac.in/courses/117103063/

The break-up of CIE: Internal Tests + Assignments + Quizzes
1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

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

DIGITAL ELECTRONICS AND LOGIC DESIGN
SYLLABUS FOR III-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code : **U18ES320IT**
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
The Course will enable the students to design combinational and sequential circuits.	1. Simplify Boolean Functions using algebraic and K-map techniques to s specific number of literals. 2. Design combinational circuits using fundamental logic gates and programmable logic devices for a given problem. 3. Draw the circuits of different types of flipflops and explain their operation using Truth tables and excitation tables. 4. Analyze any given synchronous or asynchronous sequential circuit and design synchronous or asynchronous sequential circuits for a given specification of the problem. 5. Implement combinational and sequential circuits using VHDL programming language.

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

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

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

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

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

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

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

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

Duration of Internal Tests   : 90 Minutes

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

ADVANCED DATA STRUCTURES
SYLLABUS FOR III-SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks :60	Course Code : **U18PC310IT**
Credits : 2	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
Explore efficient storage mechanisms for easy access, design and implementation of various non-linear data structures.	1. Implement operations on Binary Trees and Efficient Binary Search Trees and graphs. 2. Choose the right non-linear data structure based on the requirements of the problem. 3. Implement hashing techniques.

UNIT – I:Non Linear Data Structures:
Review of Linear Data Structures.
Trees: Introduction, Binary Trees, Binary Tree Traversals,Heaps. Binary Search trees (BST) : Definition, Searching a BST, Insertion into a BST, Deletion from a BST.

UNIT – II: 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.

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

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

Learning Resources :
1. Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, 2/e, Universities Press, 2008
2. Mark A Weiss, Data Structures and Algorithm Analysis In C, Second Edition (2002), Pearson
3. Richard F, Gilberg, B.A. Forouzan, "Data Structures, A Pseudocode Approach with C", Cengage, 2nd Edition
4. Data Structures through C in depth,S K Srivastava,Deepali Srivastava,BPB publications,2nd Edition
5. http://nptel.ac.in/courses/106106127/
6. http://nptel.ac.in/courses/106103069/

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

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

Duration of Internal Tests   :   90 Minutes

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

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

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **U18PC320IT**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

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

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

UNIT-II: Exception Handling: Introduction, types of exceptions, syntax of exception handling code, multiple catch statements, using finally statement, user-defined exceptions.
Multithreaded Programming: Introduction to threads, creating threads, extending the Thread class, implementing the Runnable interface, life cycle of a thread, priority of a thread, synchronization, and Inter-thread Communication.

UNIT-III: Exploring java.io : Java I/O classes and interfaces, Files, Stream and Byte classes, Character Streams, Serialization.
Exploring java.lang: Object, Wrapper classes, String, StringBuffer, System.
Exploring java.util: Scanner, StringTokenizer, Date, Calendar.

UNIT-IV: Introduction to Generics: Defining Generics, Generics and Subtyping, Wildcards, Generic Methods.
Introduction to Collections: Collection Framework, Benefits of Collections Framework, Collection Framework Interfaces :   Collection , Set, List, Queue, Deque, Sorted Set, Map, Sorted Map.   Collection Framework Implementations : HashSet, TreeSet, ArrayList, LinkedList, PriorityQueue, ArrayDeque, HashMap, TreeMap. Traversing Collections.Collection Framework Algorithms : Sorting, Searching.

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

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

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

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

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

ENVIRONMENTAL SCIENCE
SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week):2:0:0	SEE Marks:60	Course Code: **U18MC010CE**
Credits : 0	CIE Marks:40	Duration of SEE: 3 Hrs

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

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

UNIT-II
Ecosystems: Structure and function of an 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 Assesment, population explosion.

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

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

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

Duration of Internal Tests   : 90 Minutes

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

INTRODUCTION TO ENTREPRENEURSHIP
SYLLABUS FOR B.E.III-SEMESTER

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

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

UNIT-I: **ENTREPRENEURSHIP**
Entrepreneurial characteristics, Classification of Enterprises, Incorporation of Business, Forms of Business organizations, Role of Entrepreneurship in economic development, Start-ups.
Idea Generation and Opportunity Assessment: Ideas generation, Sources of New Ideas, Techniques for generating ideas, Opportunity Recognition, Steps in tapping opportunities.

UNIT-II: **INSTITUTIONS SUPPORTING SMALL BUSINESS ENTERPRISES**
Central level Institutions: NABARD, SIDBI, NIC, KVIC, NIESBUD, SIDO, DST, EDI, FICCI, CII, ASSOCHAM etc., State Level Institutions: DICs, SFC, SIDC, Other financial assistance.
Entrepreneurial skills, design thinking, selling and communication. Project Formulation and Appraisal, Preparation of Project Report, Content; Guidelines for Report preparation, Project report and pitching

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

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

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

Duration of Internal Test: 90 Minutes

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

BASIC ELECTRONICS LAB
SYLLABUS FOR B.E. III SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks :50	Course Code:**U18ES311IT**
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
Identify the different electronic devices and use them in building different application circuits.	1. Identify and use different electronic devices and measuring equipments. 2. Use PN diode, Zener diode for applications like rectifiers, clipping and clamping circuits and voltage regulators. 3. Use BJT transistor in the design of amplifier circuit. 4. Implement different types of oscillator circuits. 5. Use operational amplifier for different applications and verify the operation of different digital circuits.

ANALOG:
1. CRO and its applications: Measurement of amplitude, frequency.
2. Characteristics of pn junction diode ,
3. Characteristics of zener diode .
4. Zener diode as a Voltage Regulator
5. Half-wave Rectifier,
6. Full-wave rectifier
7. Clipping Circuits
8. Clamping Circuits
9. Characteristics of Common Emitter Transistor configuration
10. Characteristics of Common Base Transistor configuration
11. Frequency response of Common Emitter amplifier
12. RC phase shift oscillators
13. Operational Amplifier as an adder, subtractor, and comparator

DIGITAL:
1. Truth table verification of logic gates using TTL 74 series ICs.
2. Implementation of Half Adder, Full Adder
3. Verification of Multiplexer Operation.
4. Implementation of Boolean logic using decoders and MUXes.
5. Truth table verification of D flip flop, T flip-flop and JK flip-flop

Learning Resources :
1. Paul B Zbar and Alber P Malvino, Michael A Miller, "Basic Electronics: A Text Lab Manual", 7th edition, Tata McGraw Hill, 2009.
2. David A Bell, "Laboratory Manual for Electronic Devices and Circuits", 4th edition, PHI, 2001.
3. Muhammed H Rashid, "SPICE for circuits and electronics using PSPICE", 2nd edition, PHI, 1995.
4. Mithal. G.K, "Practicals in Basic Electronics", G K Publishers Private Limited, 1997.
5. Maheswari. L.K and Anand.M.M.S, "Laboratory Manual for Introductory Electronic Experiments", New Age, 2010.
6. PoornachandraRao.S and Sasikala.B, "Handbook of Experiments in Electronics and Communication Engineering", Vikas publishers, 2003
7. http://www.nptelvideos.in/2012/11/basic-electronics-prof-tsnatarajan.html

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

Marks for assessment of each experiment   18
Duration of Internal Test: 2 Hours

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

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

L:T:P(Hrs./week):0:0:2	SEE Marks :50	Course Code: **U18PC311IT**
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
Design and implement of abstractions of non linear data structures and their practical applications.	1. Implement and perform different operations on trees. 2. Implement and perform different operations on graphs. 3. Implement heap sort technique for a given data set

1. Implementation of Operations on Binary Tree
   (a) Insert
   (b) Delete
   (c) Level Order
   (d) Search

2. Implementation of Tree Traversals on Binary trees.

3. Write a program to create a binary search tree(BST) by considering the keys in given order and perform the following operations on it.
   (a) Minimum key
   (b) Maximum key
   (c) Search for a given key

4. Write a program to create a binary search tree(BST) by considering the keys in given order and perform the following operations on it.
   (a) Find predecessor of a node
   (b) Find successor of a node
   (c) delete a node with given key

5. Write a program to construct an AVL tree for the given set of keys. Also write function for rotations and also apply these rotations to balance an AVL Tree while performing the following operations
   a)Insertion
   b)Deletion

6. Implementation of Breadth First search Traversal on Graphs.

7. Implementation of Depth First search Traversal on Graphs.

8. Implementation of Heap Sort.

Learning Resources :
1. Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, 2/e, Universities Press, 2008
2. Mark A Weiss, Data Structures and Algorithm Analysis In C, Second Edition (2002), Pearson
3. Richard F, Gilberg, B.A. Forouzan, "Data Structures, A Pseudocode Approach with C", Cengage, 2nd Edition
4. Data Structures through C in depth,S K Srivastava,Deepali Srivastava,BPB publications,2nd Edition
5. http://nptel.ac.in/courses/106106127/
6. http://nptel.ac.in/courses/106103069/

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

Marks for assessment of each experiment   18
Duration of Internal Test: 2 Hours

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

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

L:T:P(Hrs./week):0:0:2	SEE Marks : 50	Course Code : **U18PC321IT**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

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

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

JAVA API(java.io package)
12.a) A program to illustrate the use of FileInputStream and
       FileOutputStream
   b) A program to illustrate the use of BufferedInputStream and BufferedOutputStream.
   c) A program to illustrate the use of ObjectInputStream and ObjectOutputStream.

JAVA API(java.util package)
13.a) A program to demonstrate the use of Scanner class to read user
    input.
   b) A program to demonstrate the use of StringTokenizer.
   c) A program to demonstrate the use of Date and Calendar.

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

JAVA API(java.awt , java.awt.event and , javax.swing package)
15. a) An application involving GUI with different controls using AWT.
    b) An application involving GUI with different controls using Swing.
    c) An application using Applet.

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

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

Marks for continuous assessment of experiments   18
Duration of Internal Test: 2 Hours

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 : **U18OE310IT**
Credits : 2	CIE Marks :40	Duration of SEE : 3 Hours

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

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

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

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

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

Learning Resources :
1. Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, 2/e, Universities Press, 2008
2. Mark Allen Weiss, ―Data Structures and Algorithm Analysis in C, Second Edition, Pearson Education, 1996
3. Robert Kruse, C.L.Tondo, Bruce Leung, Shashi Mogalla , ― Data Structures and Program Design in C, Second Edition, Pearson Education, 2007
4. Jean-Paul Tremblay, Paul G. Sorenson,'An Introduction to Data Structures with Application', TMH, 2nd Edition.
5. Richard F, Gilberg, B.A. Forouzan, "Data Structures, A Pseudocode Approach with C", Cengage, 2nd Edition
6. http://nptel.ac.in/courses/106106127/

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

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

Duration of Internal Tests   :   90 Minutes

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

INTRODUCTION TO LINUX
(Open Elective – I)
SYLLABUS FOR –III SEMESTER
(for other Branches)

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

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

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

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

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

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

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

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

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

Duration of Internal Tests : 90 Minutes

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

Course Code	Course Name	Scheme of Instruction			Scheme of Examination			
		Hours per week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
U18HS010EH	Human Values and Professional Ethics – I	1	-	-	2	40	30	1
U18HS430EH	Skill Development-II : Communication Skills in English	2	-	-	3	60	40	2
U18BS420MA	Probability and Statistics	3	-	-	3	60	40	3
U18PC410IT	Computer Organization	3	-	-	3	60	40	3
U18PC420IT	Database Management Systems	3	-	-	3	60	40	3
U18PC430IT	Design and Analysis of Algorithms	3	-	-	3	60	40	3
U18PC440IT	Software Engineering	2	-	-	3	60	40	2
U18OE4XXXX	Open Elective – II	3	-	-	3	60	40	3
PRACTICALS								
U18PC411IT	Database Management Systems Lab	-	-	2	3	50	30	1
U18PC421IT	Design and Analysis of Algorithms Lab	-	-	2	3	50	30	1
U18PC431IT	Software Engineering Lab	-	-	2	3	50	30	1
Student should complete one online certificate course during III-VIII Semester								
Total		**20**	**-**	**6**	**-**	**610**	**400**	**23**
Grand Total		**26**			**-**	**1010**		

Note:
1. One hour is allotted to Library / Sports / Proctorial Interaction.
2. The left over hours are to be allotted to CCA-II / RC / CC / TC based on the requirement.

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
Department of Humanities & Social Sciences

HUMAN VALUES AND PROFESSIONAL ETHICS-1
SYLLABUS FOR BE III/IV SEMESTER
(COMMON FOR ALL BRANCHES)

L:T:P (Hrs/Week): 1:0:0	SEE Marks: 40	Course Code: **U18HS010EH**
Credits: 1	CIE Marks: 30	Duration of SEE: 2 Hours

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

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

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

MODE Of DELIVERY

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

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

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

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

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

Duration of Internal Tests   :   90 Minutes

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

Department of Humanities and Social Sciences

SKILL DEVELOPMENT-II: COMMUNICATION SKILLS IN ENGLISH
FOR B.E. IV SEMESTER
(COMMON FOR ALL BRANCHES)

L:T:P(Hrs/Week): 2:0:0	SEE Marks : 60	Course Code: **U18HS430EH**
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	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	2	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	2	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests   :   90 Minutes

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

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

L:T:P(Hrs/week):3:0:0	SEE Marks :60	Course Code : **U19BS420MA**
Credits :3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
1. **Study** the concepts and application of conditional probability 2. **Understand** various concepts of Random variables and standard Statistical Distributions 3. **Study** various methods of testing large samples 4. **Analyze** standard statistical tests employed for small samples 5. **Understand** fitting of a straight line to a given data and measuring Correlation between variables.	1. **Apply** conditional probability to the real world problems 2. **Apply** various statistical distributions to solve practical problems,to estimate unknown parameters of populations and apply the tests of hypotheses. 3. **Infer** properties of population conducting tests on samples 4. **Categorize** population based on tests on small samples 5. **Solve** problems on fitting of a straight line to the given data and also to find co-efficient of correlation and to determine regression lines and their application problems.

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

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

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

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

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

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

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

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

Duration of Internal Tests   :   90 Minutes

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

COMPUTER ORGANIZATION
SYLLABUS FOR IV-SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code : **U18PC410IT**
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

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

UNIT – I: Basic Structure of Computers :
Computer Types, Functional Units, Basic Operational Concepts, Bus Structures, Software, Performance, Multiprocessors and Multicomputer, Memory locations and Addresses, Memory operations, Instructions and Instruction Sequencing, Addressing Modes, Assembly language, Additional Instructions

UNIT – II: Basic Processing Unit:
Register Transfer Language and Micro operations: Register Transfer Language, Register Transfer, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Arithmetic logic shift unit.
MICROPROGRAMMED CONTROL: Control memory, address sequencing, micro program example, Design of control unit, hardwired control, micro programmed control.

UNIT – III: Input Output Organization:
Peripheral devices, Input-output Interface, Asynchronous Data Transfer, Modes of Transfer, and Priority interrupt, Direct Memory Access.

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

UNIT – V: Pipelining:
Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction sets, Data path and control considerations, Super Scalar Operation.

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

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

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

Duration of Internal Tests   :   90 Minutes

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

Department of Information Technology

DATABASE MANAGEMENT SYSTEMS
SYLLABUS FOR IV-SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code : **U18PC420IT**
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
Apply the concepts of database management systems and design relational databases.	1. Understand functional components of the DBMS and develop ER model for a given problem and map ER it to Relational model 2. Devise queries using Relational Algebra and SQL 3. Design a normalized database schema using different normal forms. 4. Apply indexing and hashing techniques for effective data retrieval. 5. Understand transaction processing, concurrency control and recovery techniques

UNIT – I:
Introduction to DBMS: Overview, File system vs DBMS, Advantages of DBMS, Database System Applications, Relational Databases, Object – Based and Semi-structured Databases, Data Storage and Querying, Database Architecture, Database Users and Administrators.
Database Design and the E-R Model: Overview of the Design Process,   The E-R Model, Constraints, E-R Diagrams, E–R Design Issues, Weak Entity Sets, Extended E-R Features.

UNIT – II:
Relational Model: Structure of Relational Databases, Reduction to Relational Schemas, Other Aspects of Database Design. Relational Algebra: Fundamental Relational-Algebra Operations, Additional Relational – Algebra Operations, Extended Relational -Algebra Operations, Null Values, Modification of the Databases.
Structured Query Language: Data Definition, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Complex Queries, Views, Joined Relations.

UNIT – III:
Advanced SQL and PLSQL: SQL Data Types and Schemas, Integrity Constraints, Authorization, SQL functions, procedural SQL, embedded SQL, cursors, ODBC and JDBC, triggers
Schema Refinement: Features of Good Relational Design, Functional-Dependency Theory, Decomposition Using Functional Dependencies, Normalization, First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form, Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form.

UNIT – IV:
Indexing and Hashing: Basic Concepts, Ordered Indices, B+-tree Index Files, B-tree Index Files, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices, Index Definition in SQL.
Transactions: ACID properties, Transaction States, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability.

UNIT – V:
Indexing and Hashing: Basic Concepts, Ordered Indices, B+-tree Index Files, B-tree Index Files, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices,Index Definition in SQL
Transactions: ACID properties, Transaction States, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability.

Learning Resources:

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

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

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

Duration of Internal Tests : 90 Minutes

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

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

L:T:P(Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **U18PC430IT**
Credits : 3	CIE Marks : 40	Duration of SEE: 3 Hrs

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

UNIT 1:
Introduction: Characteristics of algorithm. Analysis of algorithm: Asymptotic analysis of complexity bounds – best, average and worst-case behavior; Performance measurements of Algorithm, Analysis of recursive algorithms through recurrence relations: Substitution method, Recursion tree method, Amortized analysis.

UNIT 2:
Divide and conquer: The general method, Iterative and Divide and conquer for Binary search, Merge sort, Quick sort, Masters' theorem.
Greedy Method: The general method, Knapsack problem, Job sequencing with deadlines, Optimal storage on tapes, Optimal merge patterns, Huffman Codes, Dijikstra's algorithm.

UNIT 3:
Dynamic Programming: The general method, Bellman-Ford Algorithm, Multistage graph, All-Pairs Shortest Paths, Matrix chain multiplication, Optimal Binary Search trees, 0/1 Knapsack, Reliability design, Traveling Salesman Problem, Bi-connected components and DFS.

UNIT 4:
Backtracking: The general method, 8-Queens Problem, Graph Coloring, Hamiltonian cycles, Knapsack Problem
Branch and Bound: The general method, 0/1 Knapsack Problem, Traveling salesperson problem

UNIT 5:
NP-Hard and NP-Completeness: Basic concepts, NP-hard graph problems-Clique Decision Problem, Node Cover Decision Problem, NP-Hard Scheduling Problem - scheduling identical processors, NP-Hard code scheduling problems – Code generation with common sub-expression.

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

The break-up of CIE : Internal Tests   + Assignments + Quizzes
1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests   : 90 Minutes

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

SOFTWARE ENGINEERING
SYLLABUS FOR B.E IV- SEMESTER

L:T:P (Hrs/week): 2:0:0	SEE Marks : 60	Course Code : **U18PC440IT**
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
Understand the various SDLC models and stages in Software design lifecycle.	1. Select the most suitable software process model out of several, for the development of a given software project. 2. Develop the ability to elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project. 3. Understand the software design principles and learn how to apply them towards implementation. 4. Compare different ways and techniques of ensuring software quality and apply various test processes and techniques on conventional applications.

UNIT I
Introduction to Software Engineering: Definition of Software Engineering, application areas of software engineering, Process Framework, Process Patterns, Process Assessment, Personal and Team Process Models, Process Technology, Product and Process.
Process Models: Prescriptive Models, Waterfall Model, Incremental Process Models, Evolutionary Process Models, Specialized Process Models, and the Unified Process.
An Agile view of Process: What is Agility. What is an Agile Process, and Agile Process Models.

UNIT II
Understanding requirements: Requirement Analysis, Data Modeling Concepts, Scenario-Based Modeling, Flow-Oriented Modeling, Class-Oriented Modeling, Creating a Behavioral Modeling
Design Engineering: Design within the context of SE, Design Process, Design Concepts, and the Design Model.

UNIT III
Architectural Design: Software Architecture, Architecture Genres, Architecture Styles, Architectural Design.
Component level Design: What is a Component,Designing Class-Based Components, Conducting Component-Level Design, Component-Based development and Object Constraint Language.
Performing User Interface Design: The Golden rules, User Interface Analysis and Design, Interface Design Steps, and design Evaluation.

UNIT IV
Software Testing Strategies: A Strategic Approach to Software Testing, Strategic Issues, Validation Testing, System Testing, Black-box and White-box testing, Basis path testing, and Control Structure testing and the Art of Debugging.
Software Quality Assurance (SQA): Elements of Software Quality Assurance, SQA Tasks, Goals and Metrics, and SQA Plan, Software Configuration Management CMMI, ISO 9000 Quality Standards.

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

The break-up of CIE: Internal Tests+ Assignments + Quizzes
1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests   :   90 Minutes

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

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

L:T:P(Hrs/week): 0:0:2	SEE Marks :50	Course Code: **U18PC411IT**
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
Implement various SQL and PL/SQL constructs and develop small size database application.	1. Design and implement a database schema 2. Devise queries using SQL commands 3. Develop application programs using PLSQL 4. Generate reports for given requirements

1.   DDL Commands:
a. Creation of tables with appropriate integrity constraints
b. Usage of alter, drop commands

2.   DML Commands:
a. Data Insertion and Updating
b. Usage of truncate command

3.   TCL and DCL Commands:
a. Setting privileges
b. save point, commit and rollback commands

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

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

6.   PL/SQL:
a. Blocks, Select Statement and control statements
b. Stored procedures and functions
c. Packagesd. Exception Handling
e. Cursors
f. Triggers

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

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

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

Day-to-day laboratory class work which will be awarded based on the average of assessment for each experiment considering at the end of the course   18
Duration of Internal Test: 2Hours

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

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

L:T:P (Hrs/week):0:0:2	SEE Marks : 50	Course Code : **U18PC421IT**
Credits : 1	CIE Marks : 30	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
Develop skills in design and implementation of abstractions of various algorithm strategies and their practical applications.	1. Apply divide and conquer approach to solve searching and sorting problems. 2. Design and implement algorithms using Greedy strategy for the problems; Fractional knapsack, Huffman codes, shortest path finding (Dijkstra's algorithm). 3. Use Dynamic programming approach to solve problems including, shortest path finding (Bellman ford algorithm, All pair shortest path), Matrix chain multiplication, 0/1 Knapsack problem. 4. Solve N-Queens problem and Graph colouring problem using Backtracking approach. 5. Implement Branch & Bound algorithm for 0/1 Knapsack problem and Travelling Salesman problem.

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

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

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

Learning Resources:
1. Ellis Horowitz, Sartaj Sahani, Sanguthevar Rajasekaran," Fundamentals of computer Algorithms", Second edition (2008),Universities Press
2. Thomas H. Cormen, Leiserson C.E, Rivest.R.L , Stein.C, Introduction to Algorithm, 2nd edition (2001), MIT press, USA.Introduction to Algorithms, 4TH Edition, Thomas H Cormen, Charles E Lieserson,
3. Algorithm Design, 1ST Edition, Jon Kleinberg and ÉvaTardos, Pearson.

4. Algorithm Design: Foundations, Analysis, and Internet Examples, Second Edition, Michael T Goodrich and Roberto Tamassia, Wiley.
5. Algorithms -- A Creative Approach, 3RD Edition, UdiManber, Addison-Wesley, Reading, MA.
6. B.A.Forouzan & Richard F.Gilberg, "A Structured Programming Approach using C" 2nd Edition, Cengage Learning, 2007.
7. Mark A Weiss, Data Structures and Algorithm Analysis In C, Second Edition(2002), Pearson
8. https://ocw.mit.edu/courses/electrical-engineering-and-computerscience/6-006-introduction-to-algorithms-fall-2011/lecture-videos
9. http://nptel.ac.in/courses/106106127/
10. http://www.nptel.ac.in/courses/106102064

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

Day-to-day laboratory class work which will be awarded based on the average of assessment for each experiment considering at the end of the course   18

Duration of Internal Test: 2Hours

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

SOFTWARE ENGINEERING LAB
SYLLABUS FOR B.E. IV SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks : 50	Course Code : **U18PC431IT**
Credits : 1	CIE Marks : 30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
Understand the concepts related to analysis, design, testing and Management techniques related to Object Oriented Software development.	1. Understand fundamental concepts and object-oriented techniques of systems analysis and design. 2. Be able to gather and document system requirements. 3. Generate and run test cases for various levels of testing by applying different testing methods. 4. Demonstrate the ability to use project management tools 5. Use of computer based tools to aid in system analysis and design.

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

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

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

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

Department of Information Technology

INTRODUCTION TO OBJECT ORIENTED PROGRAMMING
(Open Elective-II)
SYLLABUS FOR B.E. IV SEMESTER
(for other Departments)

L:T:P (Hrs/week):3:0:0	SEE Marks: 60	Course Code: **U18OE410IT**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
Explain the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, building simple GUI applications.	1. Understand fundamental concepts in Object oriented approach. 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.
Multithreaded Programming: Introduction to threads, creating threads, extending the Thread class, implementing the Runnable interface, life cycle of a thread, priority of a thread, synchronization, and Inter-thread Communication.

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

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

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

Learning Resources:
1. Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill, 2006.
2. James M Slack, Programming and Problem solving with JAVA, Thomson Learning, 2002.
3. C Thomas Wu, An Introduction to Object Oriented Programming with Java 5th edition, McGraw Hill Publishing, 2010.
4. Y. Daniel Liang , An Introduction to JAVA Programming, Tata McGraw Hill, 2009.

5. Kathy Sierra, Head First Java, 2/e, Shroff Publishers, 2012.
6. https://docs.oracle.com/javase/tutorial/
7. https://nptel.ac.in/courses/106105191/

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

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

Duration of Internal Tests : 90 Minutes

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

INTRODUCTION TO SCRIPTING LANGUAGES
(Open Elective-II)
SYLLABUS FOR B.E. IV SEMESTER
(for other Departments)

L:T:P(Hrs./week): 3:0:0	SEE Marks: 60	Course Code :**U18OE420IT**
Credits : 3	CIE Marks: 40	Duration of SEE : 3 Hours

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

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

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

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

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

Unit – V
File handling, serialization using JSON and pickle, encoding and decoding.

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

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

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