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 (AI & ML) V and VI Semesters

With effect from 2022-23
(For the batch admitted in 2020-21)
(R-20)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
Phones: +91-40-23146020, 23146021
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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.

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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.
P1O	**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.

B.E (CSE) PROGRAM SPECIFIC OUTCOMES (PSO's)	
PSO I	Graduates will have knowledge of programming and designing algorithms to develop solutions for engineering problems pertaining to AI&ML.
PSO II	Graduates will be able to develop models in Machine Learning, Deep Learning using knowledge of AI and modern tools.
PSO III	Graduates will apply AI&ML techniques for real world applications in the areas of Cyber Security, Image processing, Natural Language Processing and IoT.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION(R-20)
FOR B.E 2020-21 ADMITTED BATCH V SEMESTER (A.Y. 2022-23)

B.E. CSE (AI&ML) V 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								
UII20PC510CS	Microprocessors, Microcontrollers & Interfacing	3	-	-	3	60	40	3
UII20PC520CS	Computer Networks	3	-	-	3	60	40	3
UII20PC530CS	Artificial Intelligence	3	-	-	3	60	40	3
UII20PC540CS	Automata, Languages and Computation	3	-	-	3	60	40	3
UII20HS040EH	Economics and Finance for Engineers	2	-	-	3	60	40	2
UII20OE5XXXX	Open Elective-III	3	-	-	3	60	40	3
UII20HS510EH	Skill Development Course-V-(Communication Skills in English-II)	1	-	-	2	40	30	1
UII20PE510CS	Skill Development Course –VI-(Technical Skills –II)	1	-	-	2	40	30	1
UII20HS010EH	Human Values and Professional Ethics-II	1	-	-	2	40	30	1
PRACTICALS								
UII20PC511CS	Microprocessors, Microcontrollers & Interfacing Lab	-	-	2	3	50	30	1
UII20PC521CS	Computer Networks Lab	-	-	2	3	50	30	1
UII20PC531CS	Artificial Intelligence and Machine Learning Lab	-	-	2	3	50	30	1
	TOTAL	**20**	**0**	**6**		**630**	**420**	**23**
	GRAND TOTAL	**26**				**1050**		
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 Computer Science & Engineering

MICROPROCESSORS, MICROCONTROLLER & INTERFACING
SYLLABUS FOR B.E. V-SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks : 60	Course Code: **UII20PC510CS**
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 Explain the architecture of 8086 microprocessor, 8051 microcontroller and ARM processor 2 Write assembly language programs to interface I/O devices with processor and controller	1 Explain the architecture, addressing modes and instruction set of 8086 microprocessor 2 Explain interrupt handling mechanisms of 8086 microprocessor 3 Interface analog and digital I/O devices with8086 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 andstepper 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).

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	:	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 : 1 Hour 30 Minutes

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IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

COMPUTER NETWORKS
SYLLABUS FOR B.E. V-SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks : 60	Course Code: **UI20PC520CS**
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 Apply networking concepts to work on networked systems using the existing protocols and evaluate the role of security for developing end user applications	1 Compare OSI and TCP/IP reference models and explain functionalities of Data Link Layer 2 Explain MAC protocols and networking devices. 3 Analyze the design issues of network layer 4 Describe the services of transport layer 5 Apply application layer protocols for providing network services to the end user

UNIT-I:
Introduction: Network Hardware, Network Software, Reference Models, Comparison of the OSI and TCP/IP Reference Models
Physical Layer: Guided transmission media, Wireless transmission media.
Data Link Layer: Design Issues, Error Detection and Correction, Elementary Data Link Layer Protocols, Sliding Window Protocols

UNIT-II:
Multiple Access Protocols : ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer, data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

UNIT-III:
Network Layer: Network Layer Design Issues.

Routing Algorithms: Shortest path routing, flooding, distance vector routing, link state routing.
IP Addresses: IPV4, Subnetting, Supernetting, CIDR, NAT, IPV6.
Internet Control Protocols: ICMP, ARP, DHCP.

UNIT-IV:
Transport Layer: The Transport Service, Elements of Transport Protocols
The Internet Transport Protocols (TCP and UDP): UDP, TCP: Introduction, The TCP service model, The TCP protocol, The TCP Segment Header, TCP connection establishment, connection release, TCP sliding window, TCP Timer management, TCP Congestion control, Performance issues.

UNIT-V:
Application Layer: Domain Name System -DNS Name Space, Domain Resource Records, Name Servers, FTP,TELNET
Network Security: Cryptography, Symmetric Key Algorithms: DES, AES, Cipher modes.
Public Key Algorithms: RSA. Digital Signatures, Management of Public Keys.

Learning Resources:

1. Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, 5thEdition Pearson, 2012.
2. Data Communications and Networking, 4th Edition, Behrouz Forouzan, Tata McGraw Hill, 2011
3. James F. Kurose and Keith W. Ross, Computer Networking: A Top-Down Approach Featuring the Internet, 5th Edition, Addison-Wesley, 2012
4. Chwan-Hwa (John) Wu, J. David Irwin, Introduction to Computer Networks and Cyber Security, CRC Press, 2013
5. Alberto Leon-Garcia and Indra Widjaja, Communication Networks: Fundamental Concepts and Key Architectures, Tata McGraw-Hill, 2004.
6. http://nptel.ac.in/courses/106105081/1
7. https://www.youtube.com/watch?v=WabdXYzCAOU

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 : 1 Hour 30 Minutes

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Department of Computer Science & Engineering

ARTIFICIAL INTELLIGENCE
SYLLABUS FOR B.E. V-SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks : 60	Course Code: **UII20PC530CS**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVE	**COURSE OUTCOMES** *On completion of the course, students will be able to*
Understand issues and techniques involved in the creation of intelligent systems.	1 Solve searching problems using A*. 2 Develop an algorithm for playing games. Represent the knowledge using propositional logic. 3 Create logical agents to do inference using first order logic. 4 Perform planning and solve problem with constraints. 5 Explain Bayesian Networks to do probabilistic reasoning

UNIT I:

Introduction: Introduction to AI

Intelligent Agents: Agents and Environments, Good Behavior: The Concept of Rationality, The Nature of Environments, The Structure of Agents.

Solving Problems By Search: Problem Solving Agents, Example problems, Searching for Solutions, Uninformed Search Strategies: Breadth-first search, Depth-first search, Depth limited search, Iterative deepening depth first search, Informed (Heuristic) Search Strategies: Greedy best-first search, A* Search: Minimizing the total estimated solution cost, Heuristic Functions, Local Search Algorithms and Optimization Problems.

UNIT II:

Adversarial Search: Games, Optimal decisions in games, Alpha-BetaPruning, Imperfect real time decisions.

Logical Agents – Knowledge-Based agents, The Wumpus World, Logic, Propositional Logic: A Very Simple Logic, Propositional theorem proving.

UNIT III:

First Order Logic: Syntax and Semantics of First-Order Logic, Using First-Order Logic, Knowledge Engineering in First-Order Logic.

Inference In First Order Logic: Propositional vs. First-Order Inference, Unification and Lifting, Forward Chaining Algorithm , Backward Chaining algorithm, Resolution.

UNIT IV:

Constraint Satisfaction Problems: Defining Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search for CSPs, Local Search for CSPs, The Structure of Problems.

Classical Planning: Definition of Classical Planning, Algorithms for Planning with State-Space Search, Planning Graphs, other Classical Planning Approaches, Analysis of Planning approaches.

UNIT V:

Uncertainty: Acting under Uncertainty, Basic Probability Notation, Inference Using Full Joint Distributions, Independence, Bayes' Rule and its Use.

Probabilistic Reasoning – Representing Knowledge in an Uncertain Domain, The Semantics of Bayesian Networks, Efficient Representation of Conditional Distribution, Exact Inference in Bayesian Networks.

Learning Resources:

1. Stuart Russell, Peter Norvig, Artificial Intelligence – A Modern Approach, Third Edition (2019), Pearson
2. Nils J. Nilsson, Artificial Intelligence: A New Synthesis, (1998),Elsevier
3. Daniela Witten, Gareth James, Robert Tibshirani, and Trevor Hastie, An Introduction to Statistical Learning with Applications in R (Springer Texts in Statistics)
4. George F Luger , Artificial Intelligence, Structures and strategies for ComplexProblem Solving, Sixth Edition,(2009), Pearson
5. Elaine Rich, Kevin Knight, Shivashankar B Nair, Artificial

Intelligence, ThirdEdition(2009), Tata McGraw Hill
6. http://www.nptel.ac.in/courses/106105077
7. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6- 034-artificial-intelligence-spring-2005
8. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6- 034-artificial-intelligence-fall-2010/lecture-videos

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

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

Duration of Internal Tests : 1 Hour 30 Minutes

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

Department of Computer Science & Engineering

AUTOMATA, LANGUAGES AND COMPUTATION

SYLLABUS FOR B.E. V-SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks : 60	Course Code :**UII20PC540CS**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 Understand the relationships among machines, languages and computational problems. 2 Design abstract models for formal languages. 3 Determine the decidability of computational problems.	1 Design Finite Automata for Regular Languages. 2 Apply formal mathematical methods to prove properties of languages, grammars and Automata. 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 Chandrashekaran, '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/
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	:	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 : 1 Hour 30 Minutes

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

Department of Humanities and Social Sciences

ECONOMICS AND FINANCE FOR ENGINEERS
SYLLABUS FOR B.E-V SEMESTER

L:T:P(Hrs/Week): 2:0:0	SEE Marks : 60	Course Code: **UII20HS040EH**
Credits: 2	CIE Marks : 40	Duration of SEE : 03 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
The objective of the Course is to equip the prospective engineers with the concepts and tools of economics, finance, cost and taxes for business decisions	1. Enable students to identify the essential components such as production quantity limits, elasticity, demand and supply in business decision making. 2. Facilitate students in calculation of cost components to enable control of costs. 3. Make better investment decisions both in short and long run by understanding the financial viability of given investment proposals. 4. Analyze the given financial statements of a firm to understand the past performance and to make decisions for future. 5. Identify the impact of the new tax policies on the company's financial structure/ individual's incomes

Unit I:
Basics of Economics: Scarcity Definition of Economics - Macro and Micro Economics -Managerial Economics - Meaning of a Firm - Objectives of a Firm - Demand Concept and Law of Demand -Price Elasticity of Demand (types), Income elasticity - cross elasticity - advertising elasticity - Meaning of Supply -Equilibrium Price and Quantity -Production -Cobb Doughlas Production Function - Economies of Scale. (Simple problems on computation of elasticity)

Unit II:
Cost and Price: Cost - Meaning -Classification of Costs -Short run and Long run costs -Cost Sheet - Break even Analysis - Methods of Pricing (Problems on Cost Sheet, Breakeven Analysis and Methods of Pricing can be asked).

Unit III:
Sources and uses of Finance: RBI and its role - Commercial Banks - Functions -Capital Budgeting -Discounting and Non discounting Techniques (including simple problems) - Working Capital Management - Concepts and Components of Working Capital –determinants of working capital - Operating Cycle - estimation of working capital.

UNIT IV:
Understanding Financial Statements: Financial Statements- Meaning - Types -Purpose - Ratios(Liquidity, Solvency & Profitability Ratios including problems)

Unit V:Direct & Indirect Taxes: Heads of Income - Income from Salaries - Income from House Property - Income from Business - Income from Capital Gains -Income from Other Sources –old and new regime tax rates and calculation of tax - Latest Tax Rates - GST -CGST - SGST - IGST - GST network.

Learning Resources:
1. S.P.Jain and K.LNarang., "Cost Accounting", Kalyani Publishers, Twentieth Edition Revised– 2008.
2. S.P.Jain and K.L Narang., "Financial Accounting", Kalyani Publishers – 2002.
3. Mehta P.L.,"Managerial Economics: Analysis,Problems and Cases", Thirteenth Edition, Sultan Chand and Sons, Nineteenth Edition - 2013.
4. M.Y.Khan and P.K. Jain., "Financial Management – Text, Problems and Cases", Mc Graw Hill Education Private Limited, New Delhi.
5. Vinod KSinghania and Kapil Singhania., "Direct Taxes Law and Practice", Taxmann Publications, Sixtieth Edition - 2018.
6. Dr,Vinod K Singhania., "Students' Guide to GST and Customs Law", Taxmann Publications, Edition - 2018.
7. Muralidharan., "Modern Banking", Prentice Hall of India.
8. Accounting for Managers by Narayana swamy

Reference Books:

1. M. L. Seth., “Micro Economics”, Lakshmi Narain Agarwal.
2. Dr. R.P. Rustagi., “Fundamentals of Financial Management”Taxmann Publications.
3. Dr. D.M. Mithani, “Money Banking International Trade & Public Finance”, Himalaya Publishing House - 2014.
4. Rajesh., “Banking Theory and Practice”, Tata Mc Graw Hill Publishing

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 : 1 Hour 20 Minutes

OPEN ELECTIVES OFFERED IN B.E. V SEMESTER (2022-23)

Dept	Title (Open Elective-III)	Code	Credits
Civil	Spatial Information Technology	U20OE510CE	3
ECE	Sensors for Engineering Applications	U20OE510EC	3
EEE	Solar Power and applications	U20OE510EE	3
Mech	Introduction to Robotics	U20OE510ME	3
	Introduction to Automobile Engineering	U20OE520ME	3
Maths	Numerical Methods	U20OE510MA	3
Physics	Thin Film Technology and Applications	U20OE510PH	3
H&SS	Design Thinking	U20OE510EH	3
	Technical Writing and Professional Presentations	U20OE520EH	3

VASAVI COLLEGE OF ENGINEERING (Autonomous)
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DEPARTMENT OF CIVIL ENGINEERING

SPATIAL INFORMATION TECHNOLOGY
(Open Elective-III)

SYLLABUS FOR B.E. V SEMESTER

L : T : P (Hrs./week):3:0: 0	SEE Marks:60	Course Code: **U20OE510CE**
Credits : 3	CIE Marks:40	Duration of SEE:3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to	Upon the completion of the course, students are expected to
1. To provide fundamental knowledge on geo spatial technology such as Remote sensing GPS and GIS.	1. Select the type of remote sensing technique/data, identify and analyze the earth surface features from the satellite images. 2. Identify GPS components, interpret the navigational message and signals received by the GPS satellites, Identify the error sources and apply corrections for accurate positioning. 3. Analyse the basic components of GIS, process spatial and attribute data, identify and rectify mapping inaccuracies and prepare thematic maps

Unit-I: Introduction and Basic Concepts of Remote Sensing : Introduction, Basic concepts of remote sensing, Airborne and space born sensors, Passive and active remote sensing, EMR Spectrum, Energy sources and radiation principles, Energy interactions in the atmosphere, Energy interactions with earth surface features, Atmospheric windows, Spectral reflectance curves

Unit-II: Remote Sensing Systems: Satellites and orbits, Polar orbiting satellites, Image characteristics and different resolutions in Remote Sensing, Multispectral, thermal and hyperspectral remote sensing. Some remote sensing satellites and their features, Map and Image, color composites, introduction to digital data, elements of visual interpretation techniques. Applications of Remote sensing in various fields.

Unit-III: Global positioning Systems (GPS) : Overview of GNSS and Introduction to GPS, GLONASS, GALILEO, COMPASS, IRNSS systems , Applications of GPS.
GPS: Basic concepts, Functional system of GPS – Space segment, control segment and user segment, Working principle of GPS, Signal structure and code modulation, Pseudo-range measurements and navigation message

Unit-IV: Errors and Positioning methods of GPS: Errors and biases in GPS measurements, Accuracy of navigation position: UERE and DOP, Intentional degradation of GPS signals: Selective availability (SA) and Anti-spoofing (AS) Differential GPS: Space based augmentation systems (e.g., SBAS, GAGAN) and Ground based augmentation systems (e.g., WASS, EGNOS). GPS Carrier Phase measurements: Single Differencing, Double Differencing and Triple Differencing in GPS measurements.
Unit-V:Basic Concepts: Introduction to GIS, History of GIS, Early development in GIS, Areas of GIS application, Components of GIS, Overview of GIS Software packages, Current issues and Trends in GIS. Variables-Point, line, polygon, Geographic coordinate system, Map projections, Map Analysis.
GIS Data: Data types – spatial, non-spatial (attribute data) – data structure, data format – point line vector – Raster – Polygon
Data Input : Keyboard entry, Manual Digitizing, Scanner, Remotely sensed data, Existing Digital data Cartographic database, Digital elevation data
Data Editing: Detection and correction of errors, data reduction, edge matching

Learning Resources:

1. James B. Campbell & Randolph H. Wynne., Introduction to Remote Sensing, The Guilford Press, 2011
2. Lillesand, Kiefer, Chipman., Remote Sensing and Image Interpretation, Seventh Edition, 2015
3. Leick, A., GPS Satellite Survey, John Wiley: NJ, 2015
4. Hofmann, B., Lichtenegger H. and Collins J., Global Positioning System: Theory and Practice, Springer: Berlin, 2011.

5. Basudeb Bhatta, Remote Sensing and GIS, Oxford University Press, 2011.
6. Hofmann-Wellenh of, Bernhard, Lichtenegger, Herbert, Wasle, Elmar, GNSS – GPS, GLONASS, Galileo and more, 2013
7. Thanappan Subash., Geographical Information System, Lambert Academic Publishing, 2011.
8. Paul Longley., Geographic Information systems and Science, John Wiley & Sons, 2005
9. John E. Harmon & Steven J. Anderson., The design and implementation of Geographic Information Systems, John Wiley & Sons, 2003
10. ArcGIS 10.1 Manuals, 2013.
11. Kang Tsung Chang., Introduction to Geographic Information Systems, Tata Mc Graw Hill Publishing Company Ltd, New Delhi, 2008.
12. Burrough, P.A., Principles of GIS for Land Resource Assessment, Oxford Publications, 2005.
13. C.P.Lo & Albert K. W.Yeung, Concepts and Techniques of Geographic Information Systems, Prentice Hall India Pvt.Ltd, 2002.

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 ELECTRONICS AND COMMUNICATION ENGINEERING

SENSORS FOR ENGINEERING APPLICATIONS (OPEN ELECTIVE-III)

SYLLABUS FOR B.E. V - SEMESTER (for other branches)

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: **U20OE510EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. The student will come to know the various stimuli that are to be measured in real life instrumentation. 2. He will be able to select the right process or phenomena on which the sensor should depend on 3. He will be aware of the various sensors available for measurement and control applications.	*On completion of the course, students will be able to* 1. Appreciate the operation of various measuring and control instruments which they encounter in their respective fields. 2. Visualize the sensors and the measuring systems when they have to work in areas of interdisciplinary nature and also think of sensors and sensors systems when for a new situation they encounter in their career 3. Identify and select the right process or phenomena on which the sensor should depend on. 4. Know various stimuli that are to be measured in real life instrumentation.

UNIT - I

Introduction to sensors and transducers .Need for sensors in the modern world. Different fields of sensors based on the stimuli - various schematics for active and passive sensors. Static and dynamic characteristics of sensors - zero, I and II order sensors – Response to impulse, step, ramp and sinusoidal inputs. Environmental factors and reliability of sensors.

UNIT – II

Sensors for mechanical systems or mechanical sensors - Displacement - acceleration and force - flow of fluids - level indicators - pressure in fluids - stress in solids. Typical sensors - wire and film strain gauges, anemometers, piezo electric and magnetostrictive accelerometers, potentio metric sensors, LVDT.

UNIT – III

Thermal sensors – temperature – temperature difference – heat quantity. Thermometers for different situation – thermocouples thermistors – color pyrometry.

Optical sensors: light intensity – wavelength and color – light dependent resistors, photodiode, photo transistor, CCD, CMOS sensors.

Radiation detectors: radiation intensity, particle counter – Gieger Muller courter (gas based), Hallide radiation detectors.

UNIT – IV

Magnetic sensors: magnetic field, magnetic flux density – magneto resistors, Hall sensors, super conduction squids.

Acoustic or sonic sensors: Intensity of sound, frequency of sound in various media, various forms of microphones, piezo electric sensors.

UNIT – V

Electrical sensors: conventional volt and ammeters, high current sensors, (current transformers), high voltage sensors, High power sensors.

High frequency sensors like microwave frequency sensors, wavelength measuring sensors.

MEMs and MEM based sensors.

Learning Resources :

Doebelin, “Measurement Systems: Application and Design”, McGraw Hill Kogakusha Ltd.

Julian W. Gardner, Vijay K. Varadan, Osama O. Awadelkarim “Microsensors, MEMS and Smart Devices”, New York: Wiley, 2001.

Henry Bolte, “Sensors – A Comprehensive Sensors”, John Wiley.

Jocob Fraden,” Handbook of Modern Sensors, Physics, Designs, and Applications”, Springer.

Manabendra Bhuyan,” Intelligent Instrumentation Principles and Applications”, CRC Press.

Randy Frank,” Understanding Smart Sensors”, Second edition, Artech House.

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 ELECTRICAL AND ELECTRONICS ENGINEERING

Solar Power and Applications
Open Elective-III
SYLLABUS FOR B.E. V SEMESTER

L: T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U20OE510EE**
Credits:3	CIE Marks: 40	Duration of SEE: 3Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
To impart the basics of solar energy harnessing and solar panel and array.	1. Compare different energy resources. 2. Identify and choose proper type of meter for solar radiation measurement. 3. Use proper solar thermal system according to the load requirements. 4. Categorize and compare photovoltaic cells. 5. Apply the knowledge of solar energy.

Unit – I

Fundamentals of Energy Sources: Oil crisis of 1973, Classifications of Energy Resources, Importance of Non-conventional energy sources, Advantages-disadvantages and salient features of Non-conventional energy sources.

Unit – II

Solar Energy Basics: Sun as a source of energy, the Earth, Radiation Spectrums, Extraterrestrial and Terrestrial Radiations, Depletion of solar Radiation, Pyranometer, Pyrheliometer, Sunshine Recorder.

Unit – III

Solar Thermal Systems: Solar Collectors, Solar Water Heater, Solar Passive space – heating and cooling systems, Solar Cookers, Solar furnaces, Solar thermal water pump, Vapour compression refrigeration and Solar pond Electric power plant.

Unit – IV

Solar Photovoltaic Systems: Solar Cell fundamentals, Cell characteristics, Cell classification, Module, Panel and Array, Maximizing the Solar PV output and load matching, MPPT.

Unit – V

Solar PV systems & Applications: Solar PV system classification - Stand-Alone Solar PV system and Grid-Interactive Solar PV system. Applications - Water Pumping, lighting, medical refrigeration, village power and Telecommunication.

Suggested Reading:

1. B H Khan, Non-Conventional Energy Resources, 2nd Edition, Tata McGraw Hill.
2. G. D. Rai, Non-Conventional Energy Sources, 13th Reprint 2014, Khanna Publications.

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

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

Duration of Internal Tests : 90 Minutes

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

DEPARTMENT OF MECHANICAL ENGINEERING

INTRODUCTION TO ROBOTICS (Open Elective-III)

SYLLABUS FOR B.E. V-SEMESTER

Instruction : 3 Hours	SEE Marks: 60	Course Code **: U20OE510ME**
Credits : 3	CIE Marks: 40	Duration of SEE: 3 Hours

Course objectives	**Course Outcomes**
The objectives of this course are to: Identify robots and its peripherals for satisfactory operation and control of robots for industrial and non-industrial applications.	On completion of the course, the student will be able to 1. understand the anatomy of the robot and various robot configurations for it's selection depending on the task. 2. classify the end effectors , understand different types of joints, various types of robot drive systems for carrying out the assigned job effectively. 3. analyze a planar manipulator through forward kinematics and understand the control of robot manipulator for better reliability and efficiency using python programming. 4. Classify the various sensors used in robots for proper selection to an application. 5. summarize various industrial and non-industrial applications of robots for their selection to a particular task.

UNIT-I
ROBOT BASICS

Robot-Basic concepts, Definition, Need, Law, History, Anatomy, specifications.

Robot configurations-cartesian, cylindrical, polar ,articulated and SCARA, Serial manipulator &Parallel Manipulator
Robot wrist mechanism, Precision and accuracy of robot.

UNIT-II
ROBOT ELEMENTS
End effectors-Classification, Robot drive system types: Electrical, pneumatic and hydraulic. Robot joints and links-Types, Motion interpolation, Robot trajectories2D and 3D Transformation- Scaling, Rotation and Translation, Homogeneous transformation

UNIT-III
ROBOT KINEMATICS AND CONTROL
Robot kinematics – Basics of direct and inverse kinematics. D-H matrix. Forward kinematics for a 2-link RR planar manipulator.
Control of robot manipulators – Point to point and Continuous Path Control. Robot programming methods. Introduction to Solve any robotic kinematic problem using python programming.

UNIT-IV
ROBOT SENSORS
Sensors in robots – Touch sensors-Tactile sensors – Proximity and range sensors. Force sensors, Light sensors, Pressure sensors, position and velocity feedback devices.
Introduction to Machine Vision and Artificial Intelligence.

UNIT-V
ROBOT APPLICATIONS
Applications of robots in Industries, Medical, Household, Entertainment, Space, Underwater, Defense, and Disaster management.
Applications of Micro and Nanorobots, Future Applications of robots.

Learning Resources:
1. Mikell P. Groover, Mitchell Weiss, Roger N Nagel and Nicholas G Odrey, “Industrial Robotics Technology, Programming and Applications”, TataMcGraw-Hill Publishing Company Limited , 2008.
2. Deb.S.R and Sankha Deb, "Robotics Technology and Flexible Automation", Tata McGraw HillPublishing Company Limited, 2010.
3. KlafterR.D, Chmielewski T.A, and Negin. M, “Robotic Engineering: An Integrated Approach”, Prentice Hall of India Pvt. Ltd.,1994.
4. K.S. Fu,R.C. Gonzalez and C.S.G.Lee , “Robotics control, sensing, vision and intelligence”,TataMcGraw-Hill Publishing Company Limited, 2008

5. R.K. Mittal and I.J.Nagrath “Robotics and Control”, Tata McGraw-Hill Publishing Company Limited, 2003.

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

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

Duration of Internal Test: 1 Hour 30 Minutes

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

DEPARTMENT OF MECHANICAL ENGINEERING

INTRODUCTION TO AUTOMOBILE ENGINEERING (OE-III)

SYLLABUS FOR B.E. V-SEMESTER

Instruction :3Hours	SEE Marks: 60	Course Code : **U20OE520ME**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

Course objectives	**Course Outcomes**
The objectives of this course are to: 1. familiarize the student with the different types of automobiles and engine components along with its working. 2. impart adequate knowledge in fuel supply, cooling, lubrication and ignition of IC engines. 3. understand the steering geometry, steering mechanism and types of suspension systems. 4. gain the knowledge about working of clutch, gear mechanism, brakes 5. make the student conversant with types of wheels, tyres and pollution control techniques.	On completion of the course, the student will be able to: 1. identify types of Automobiles and engine components and describe its working. 2. describe the engine fuel system in petrol and Diesel engines, cooling, lubrication systems. 3. describe the steering mechanism, suspension systems 4. describe the working principle and operation of clutch, gear mechanism and brakes. 5. know the pollutants from automobile and pollution control techniques and identify the types of wheels, tyres.

UNIT-I

Introduction: Types of automobiles: Hybrid Vehicles, Electrical, gas and Fuel cell vehicles. Chassis and body, Lay out of transmission system, Engine components: cylinder block, cylinder head, crankcase, crank shaft and cam shaft. Types and working of IC Engines: SI and CI engines, two stroke and four stroke engines.

UNIT-II

Fuel system: Fuel supply system for SI engines and CI engines. Simple carburettor, Introduction to Multipoint fuel injection system (**MPFI**) of petrol engines, Introduction to **CRDI** system for diesel engines.
Cooling system: air cooling, water cooling: Thermo syphon, pump circulation system.
Lubrication system: Petroil System, splash system, pressure lubrication: Wet sump and Dry Sump.
Ignition system: Battery Ignition System, Magneto Ignition System and Electronic Ignition System.

UNIT-III

Suspension system: Rigid axle, Independent suspension system:Double wish bone type, Macpherson strut system, Air suspension system.
Steering system: wheel alignment, Ackermann steering mechanism,steering geometry: camber, caster, toe-in, toe-out, steering linkage for vehicle with rigid axle front suspension, steering linkage for vehicle with independent front suspension.

UNIT –IV

Power Train: Single plate clutch, Multi plate clutch. Manual Gear Box: sliding mesh gear box, constant mesh gear box, synchromesh gear box and Automatic Gear Box. Working principle of Differential.
Brakes: Types: Drum and Disc brakes, Mechanical and Hydraulic Brakes, **ABS** system.

UNIT –V

Wheels and Tyres: Types of Wheels: wire wheels, disc wheels, alloy wheels. Types of tyres: Tube type, tubeless type.
Automobile Emissions and control: Automobile pollutants and sources of pollution. Pollution Control Techniques: Catalytic Converters, EGR and PCV. Bharath emission Norms.

Learning Resources:

1. Crouse & Anglin, “Automobile Engineering”, 10th Edition, Tata McGraw Hill Publishing Co. Ltd., New Delhi,. 2007.
2. Kirpal Singh, “Automobile Engineering”, Vol.I& II, 13th Edition, Standard Publishers, New Delhi 2013.
3. R.B Gupta, “Automobile Engineering” 7th Edition, Satya Prakashan, New Delhi, 2015.
4. Joseph Heitner, “Automotive Mechanics”, 2nd Edition, Affiliated East West Pvt. Ltd., 2013.

5. C.P. Nakra, “Basic Automobile Engineering”, 7th Edition, Dhanpat Rai Publishing C (P) Ltd., 2016.

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

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

Duration of Internal Test: 1 Hour 30 Minutes

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

DEPARTMENT OF MATHEMATICS

COURSE NAME: NUMERICAL METHODS
OPEN ELECTIVE –III, B.E. V Semester
(for CSE & IT only)

L:T: P (Hrs/Week):3	SEE Marks:60	Course Code: **U20OE510MA**
Credits: 3	CIE Marks:40	Duration of SEE:Hours:03

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	*At the end of the course students will be able to:*
1. Study various numerical methods to solve Algebraic and Transcendental equations. 2. Understand the methods to solve linear system of equations. 3. Understand the numerical methods in interpolation and extrapolation. 4. Understand the numerical methods in interpolation using central differences. 5. Understand numerical methods in solving ordinary differential equations.	1. Apply numerical methods to solve Algebraic and Transcendental equations which cannot be solved by traditional algebraic methods 2. Solve linear system of equations using direct and iteration methods. 3. Use various numerical methods in interpolation and extrapolation. 4. Use various numerical methods in interpolation using central differences. 5. Find numerical solutions of ordinary differential equations.

Unit – I: (8 Hours)

Solution of Algebraic and Transcendental equations:

Intermediate value property of equations-Solution of Algebraic and Transcendental equations: Bisection method, Newton-Raphson method Regula-Falsi method.

Unit – II: (8 Hours) Solution of linear system of equations:

Direct methods- Gauss elimination method- Factorization method- Iterative methods: Jacobi's Iteration method- Gauss - Seidel Iteration method-Ill-conditioned system of equations.

Unit – III: (8 Hours) Numerical differences-I

Introduction to finite differences - Interpolation- Newton's Forward and Backward Interpolation Formulae – Interpolation with unequal intervals – Lagrange's Interpolation Formula – Divided differences- Newton's divided difference formula.

Unit – IV: (8 Hours) Numerical differences-II

Central differences interpolation-Gauss's forwards and backward difference formulae-Stiriling's formula- Bessel's formula.

Unit – V: (8 Hours) Numerical Solutions of Ordinary Differential Equations

Numerical Solutions of Ordinary Differential Equations: Taylor's Series Method - Euler's Method - Modified Euler's Method – Runge-Kutta Method of 4^{th} order (without proofs).

Text Books:

1. Numerical methods in engineering and science by B.S.Grewal, Khanna publishers
2. Advanced Engineering Mathematics by R.K.Jain & S.R.K.Iyengar, Narosa publishing house.

Reference Books:

1. Numerical Analysis by S.S.Sastry, PHI Ltd.

Online Resources :

2. http://mathworld.wolfram.com/topics
3. http://www.nptel.ac.in/course.php

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

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

Duration of Internal Test: 90 Minutes

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

DEPARTMENT OF PHYSICS

THIN FILM TECHNOLOGY AND APPLICATIONS
(Open Elective-III)

SYLLABUS FOR B.E. V-SEMESTER

L:T:P (Hrs/Week):3:0:0	SEE Marks:60	Course Code: **U22OE510PH**
Credits: 3	CIE Marks:40	Duration of SEE:Hours:03

Course Objectives	Course Outcomes
Students are able to 1. Learn the fundamental atomistic mechanisms. 2. Narrate thin film deposition techniques 3. Acquire knowledge on thin film devices 4. Appreciate applications of thin films	*The students acquire the ability to* 1. State fundamental definitions of thin film technology 2. Describe thin film deposition techniques 3. Illustrate thin film devices and their use 4. Apply thin films coatings for a variety industrial applications

UNIT-I: THIN FILM GROWTH

Classification of films- formation of thin films- Condensation and nucleation, growth and coalescence of islands, -nucleation theories: capillarity and atomistic models, sticking coefficient, adhesion, substrate effect, film thickness effect.

UNIT-II: DEPOSITION TECHNIQUES

Thin film deposition techniques- simple thermal evaporation- Chemical vapor deposition technique-Advantages and disadvantages of Chemical Vapor deposition (CVD), physical vapour deposition electron beam evaporation- RF sputtering, Laser ablation- spin coating- molecular beam epitaxy (MBE), Film thickness measurement-ellipsometry, quartz crystal oscillator techniques.

UNIT-III: THIN FILM MATERIAL CHARACTERIZATION TECHNIQUES

Characterization techniques: X-Ray Diffraction (XRD), working principles of Scanning Electron Microscopy (SEM), working of Transmission Electron Microscopy (TEM), Atomic Force Microscopy (AFM), Scanning Tunneling Microscope (STM).

UNIT-IV: PROPERTIES OF THIN FILMS

Electrical conduction in continuous and discontinuous metallic thin films. Transport and optical properties of metallic, semiconducting and dielectric films.

UNIT-V: THIN FILM DEVICES AND APPLICATIONS

Anti-reflection coatings, fabrication of thin film gas sensors and temperature sensors. Thin film solar cells, Quantum well and Quantum dot solar cells. Application of thin films in different areas such as electronics, medical, defense, sports, automobiles, applications of thin films in various fields etc.

Learning resources:

- Kasturi Chopra Thin Film Device Applications, Mac Graw Hill, New York, 2012
- A. Goswami, thin film fundamentals, New age international, 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:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: 90 Minutes

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

DESIGN THINKING
(OPEN ELECTIVE-III) B.E. V Semester

L:T:P(Hrs/Week):3:0:0	SEE Marks:60	Course Code: **U20OE510EH**
Credits: 3	CIE Marks:40	Duration of SEE:Hours:03

COURSE OBJECTIVES **The course will enable the learners to:**	**COURSE OUTCOMES** **At the end of the course the learners will be able to: -**
1. Understand the critical design thinking skills needed to either improve an existing product or thinking design a new product. 2. Learn to identify customer needs and draft customer needs statements as your first step toward user innovations. 3. Learn how to translate user needs into product specifications quantitatively, and how establishing product metrics can help to define those specifications. 4. Learn to apply creativity, brainstorming, and concept generation process in designing needs solutions. 5. Learn to select and implement a product development process that's aligned with your project needs. Explore prototyping methods, strategies, and real-life examples where these have been applied to create a design that represents customer needs and product specifications.	1. Learn the concepts that drive design thinking. 2. Submit project ideas around user Innovations. 3. Identify prospective customer needs and user groups. 4. Translate needs into product specifications 5. Build out the product architecture, Create a prototype and present the prototype.

Unit 1: Design Thinking Skills

Understand the critical design thinking skills needed to either improve an existing product or design a new product.

1.1 The Need for Design Thinking
1.2 What makes design thinking unique?
1.3 Design thinking checklist

Unit 2: Identifying Customer Needs

Learn to identify customer needs and draft customer needs statements as your first step towards user innovations.

2.1 Think Users' First
2.2 Users' inherent needs
2.3 Empathy and Design Thinking
2.4 Asking the Right Questions
2.5 Persona Empathy map

Unit 3: Product Specifications

Learn how to translate user needs into product specifications quantitatively, and how establishing product metrics can help define those specifications

3.1 Creating a Design Brief Template
3.2 Stakeholder map template
3.3 Customer journey template
3.4 Context map template
3.5 Opportunity map template

Unit 4: Applied Creativity

Learn to apply creativity, brainstorming, and concept generation process in designing needs solutions.

4.1 The need to ideate
4.2 The Rules of ideation
4.3 Participating in an ideation session
4.4 Building a Creative Culture
4.5 Divergent—5 common ideation techniques

Unit 5: Product Development Processes and Prototyping

Learn to select and implement a product development process that's aligned to your project needs. Explore prototyping methods, strategies, and real-life examples where these have been applied to create a design that represents customer needs and product specifications.

5.1 The need for a prototype

5.2 The Need to Test and how to conduct a structured test
5.3 How to conduct the observers' debrief

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

Suggested Books

The Art of Innovation, by Tom Kelley*
Insight Out, by Tina Seelig*
Change by Design, Tim Brown
Weird Ideas That Work, by Robert Sutton*
Wired to Care, by Dev Patnaik
Rapid Viz, by Kurt Hanks and Larry Belliston

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 Tests:		90 Minutes		

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

TECHNICAL WRITING AND PROFESSIONAL PRESENTATIONS

OPEN ELECTIVE-III, B.E. V Semester
(Common to all branches)

L:T:P(Hrs/Week):3:0:0	SEE Marks:60	Course Code: **U20OE520EH**
Credits: 3	CIE Marks:40	Duration of SEE:Hours:03

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	At the end of the course students will be able to:
Understand the principles and mechanics of technical writing for students of engineering	Write effective reports
Identify different kinds of business correspondences and the dos and don'ts for each of them	Articulate business correspondences based on need
Make effective presentations as part of today's workplace demands	Make persuasive presentations
Recognize the need for Video and Written CVs with focus on specific elements	Design their videos CVs
Comprehend skills associated with technical writing and understand different papers ranging from process description and feasibility reports to research projects, project proposals, and SOPs	Write papers ranging from process description and feasibility reports to research projects, project proposals, and statement of purpose

UNIT 1: FORMAL & INFORMAL TECHNICAL REPORTS

- Informal Report Formats
- Project and Research Reports
- Formal Report Components, Feasibility Reports, Evaluation reports
- Analytical and Informational reports
- Executive summaries.

UNIT 2: BUSINESS CORRESPONDENCE

- Electronic communication
- Effective emails
- Instant and text messaging guidelines

UNIT 3: PROFESSIONAL PRESENTATIONS

- Paper presentations & Poster presentations
- PowerPoint presentations
- Storyboard writing

UNIT 4: RESUME & CVs

- Technical Resume
- Cover letter, resume format
- Video CVs

UNIT 5: WRITING PROPOSALS & SOPs

- Types of proposals
- Request for proposals
- Stating your objective

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

LEARNING RESOURCES

learn.talentsprint.com

1. Read Me First!: A Style Guide for the Computer Industry by Sun Technical Publications
2. Eats, Shoots and Leaves Paperback – 18 February 2010 by Lynne Truss Don't Make Me Think, Revisited: A Common Sense Approach to Web & Mobile Usability | Third Edition | By Pearson Paperback –
3. The Design of Everyday Things: Revised and Expanded Edition Paperback – Illustrated, 5 November 2013 by Don Norman (Author)

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 Tests: 90 Minutes

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

Skill Development Course-V (Communication Skills in English -II)

SYLLABUS FOR B.E.V-SEMESTER

L:T:P(Hrs/Week): 1:0:0	SEE Marks: 40	Course Code: **UII20HS510EH**
Credits: 1	CIE Marks: 30	Duration of SEE: 2 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES**
The course will enable the learners to:	**At the end of the course the learners will be able to: -**
1. Get students proficient in both receptive and productive skills 2. Enable students to build strategies for effective group interaction and help them in developing decisive awareness and personality while maintaining emotional balance. 3. To introduce students to an ideal structure for a presentation 4. To develop and improve writing and study skills needed for college work.	1. Participate in group and forum discussions by providing factual information, possible solutions, and examples 2. Present a topic by picking up the key points from the arguments placed. 3. Read between the lines and write informed opinions. 4. Prepare, present, and analyze reports

Unit 1: Delightful Discussions

1.1 Six Thinking Hats
1.2 Group Discussion Techniques (Initiation Techniques, Generating Points, Summarization techniques)
1.3 Case Study Based Group Discussions

Unit 2: Powerful Presentations

2.1 Concise Cogent Presentation
2.2 Persuasion skills
2.3 Toulmin Model
2.4 BikerB - JAM and Extempore

Unit 3: Fact, Observation and Inference

3.1 Discernment of fact and opinion

3.2 Note making and Inference
3.3 Main idea identification
3.4 Logical Conclusions

Unit 4: Effective Technical Writing

4.1 Report writing
4.2 Image Writing
4.3 Book Reviews
4.4 Movie Reviews

Learning Resources:

1. How to Win Friends and Influence People by Dale Carnegie. ...
2. Crucial Conversations: Tools for Talking When Stakes Are High by Kerry Patterson, Joseph Grenny, Ron McMillan, and Al Switzler. ...
3. Difficult Conversations: How to Have Conversations that Matter the Most by Douglas Stone, Bruce Patton, Sheila Heen, and Roger Fisher.

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

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

Duration of Internal Tests : 1 Hour 30 Minutes

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

Skill Development Course-VI (Technical Skills-II)

Industry Standard Coding Practices - 2022

SYLLABUS FOR B.E.V-SEMESTER

L:T:P(Hrs/Week): 1:0:0	SEE Marks: 40	Course Code: **UII20PE510CS**
Credits: 1	CIE Marks: 30	Duration of SEE: 2 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1. Understand importance of problem solving approaches for programming complex data structure problems. 2. Understand importance of optimized solutions for problems solving and its relevance to industry. 3. Implement mathematical and logical understanding approaches to implement test driven development practices. 4. Start participating in global coding competitions relevant to the syllabus.	1. Able to understand test and development aspects of programming by solving problems at Industry standards. 2. Able to identify and implement appropriate algorithm for a given problem. 3. Able to learn and apply string algorithms to optimize solutions to problems relevant to industry 4. Able to solve scenario based problems using trees 5. Able to code efficiently implementing the sorting algorithms for quick search operations

Review of Abstract Data structures (theory + practice)
Coding implementation of stacks using array and linked list, Problem Solving using stack data structure, coding implementation of queues using array and linked list, Problem Solving using queue data structure

Sorting Algorithms(theory + practice)
Coding solutions for Search operations implementing linear/binary search. Problem solving using Sorting algorithms: Bubble Sort, Selection Sort, Insertion Sort, Evaluation of sorting Algorithms. Problem solving using

Quick Sort, Merge Sort, O(n log n) algorithms. Scenario based problem solving using sorting techniques

Non-linear Data structures: Binary Trees(theory + practice)
Problem solving approaches using Non-linear data structures, Coding problems on the height of a binary tree, Size of a binary tree, Tree order traversals, Formation of binary trees, problem solving using Binary trees

Non-linear Data structures: Binary Search Trees(theory + practice)
Problems solving on key search on binary search trees, Time comparison and analysis on Binary Search Trees, Coding on a binary search tree problems, Search/probe sequence validation, Significance of height balancing the tree, Balancing by rotations

Tree Algorithms(theory + practice)
Problem solving using Tree algorithms, right view of a tree, top view of a tree, mirror tree, tree comparison

Algorithms – Greedy Methods -1(theory + practice)
Greedy Strategy, Problem solving on greedy problems: coin change, Activity selection problem, Examples

Technical Aptitude(theory + practice)
Company Specific Technical Aptitude questions on:

1. Debugging Skills on Language
2. Pseudo code Questions
3. Data Structures

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

1	No. of Internal Tests :	1	Max. Marks for each Internal Test :	30

Duration of Internal Tests : 1 Hour 30 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Humanities & Social Sciences

HUMAN VALUES AND PROFESSIONAL ETHICS-II

SYLLABUS FOR B.E. - V SEMESTER

(COMMON FOR ALL BRANCHES)

L:T:P(Hrs/Week): 1:0:0	SEE Marks : 40	Course Code:**UII20HS010EH**
Credits:1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES **The course will enable the learners to:**	**COURSE OUTCOMES** **At the end of the course the learners will be able to: -**
1. Create an awareness on the interrelation between Society, Ethics and Human Values 2. Understand how ethical dilemmas apply to real life scenarios 3. Develop ethical human conduct and professional competence 4. Understand the role of good ethical practices and apply it in a project	1. Identify ethical risks in everyday life and in societies that can lead to unethical choices, such as structures that diffuse responsibility or a group that has collectively de-stigmatized unethical behaviour 2. Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, and the objective presentation of data. 3. Assess their own ethical values and the social context of problems and articulate what makes a particular course of action ethically defensible 4. Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research

UNIT1 - NORMATIVE ETHICS & SOCIETAL ETHICS

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

UNIT 2 - PROFESSIONAL ETHICS - NEED **FOR ETHICAL CODES**

This unit covers the code of Professional Ethics- it is designed to ensure that students learn the necessary skills that groom them to behave like employees should, one that is socially acceptable and respectful of one another. It establishes the rules for behavior and sends a message to every employee that universal compliance is expected.

UNIT 3 - PRIVACY

This unit covers "Cyber ethics" - the code of responsible behavior on the Internet. Just as we are taught to act responsibly in everyday life with lessons such as "Don't take what doesn't belong to you" and "Do not harm others," we must act responsibly in the cyber world as well.

The basic rule is "Do not do something in cyberspace that you would consider wrong or illegal in everyday life."

UNIT 4- MEDIA AND MEDICAL ETHICS

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

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** • **Project**

Relevant Websites, CD's and Documentaries

- https://plato.stanford.edu/

Learning Resources:

- learn.talentsprint.com

The break-up of marks for CIE:

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

Duration of Internal Tests : 90 minutes

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

Department of Computer Science & Engineering

MICROPROCESSORS, MICROCONTROLLER &INTERFACING LAB

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks: 50	Course Code:**UII20PC511CS**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 Implement assembly language programs in 8086 microprocessor, 8051 and ARM controller. 2 Interface I/O devices to Microprocessor and Microcontroller.	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

COMPUTER NETWORKS LAB
SYLLABUS FOR B.E. V-SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **UII20PC521CS**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 Implement major functions of TCP/IP protocol stack with suitable algorithms. 2 Develop client server application using socket API.	1 Implement functionalities of TCP/IP protocol stack 2 Develop iterative and concurrent echo server using socket API. 3 Implement cryptographic algorithms. 4 Design wired and wireless topologies using NS3. 5 Simulate networking protocols using NS3.

Programming Exercise:

1. Understanding and using the following commands: ifconfig, netstat, ping, arp, telnet, tftp, ftp, nslookup and dig.
2. Implementation of Data Link Framing Methods- Bit, Byte and Character Stuffing.
3. Implementation of 16-bit CRC Error Detection Technique.
4. Implementation of Sliding Window Protocol.
5. Implementation of Dijkstra's Algorithm for computing the shortest path in a graph.
6. Implementation of Distance vector routing algorithm.
7. Implementation of Iterative and Concurrent Echo Server using Connection Oriented Protocol (TCP) and Connection Less Protocol (UDP).
8. Implementation of Leaky Bucket congestion control algorithm.

9. Implementation of Establishing a Shared key: The Difffie-Hellman key exchange.
10. Implementation of RSA algorithm for Encryption and Decryption in C.
11. Simulate a three nodes point – to – point network with duplex links between them. Set the queue size and vary the bandwidth and find the number of packets dropped.
12. Simulation of routing protocols.

Learning Resources:

1. W. Richard Stevens, Unix Network Programming – The Sockets Networking, Volume I – 3rd Edition (2003), Pearson Education, India
2. Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, 5th Edition (2012), Pearson Education, India
3. Cryptography & Network Security: Principles and Practices, 6th Edition (2013), Pearson India
4. James F. Kurose, Computer Networking: A Top-Down Approach, 5th Edition (2012), Pearson Education.
5. Data Communications & Networking, Behrouz. A. Forouzan, 5th Edition (2012), Tata McGraw Hill.
6. https://www.isi.edu/nsnam/ns/ With effect from the A.Y 2018-19

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

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LAB

SYLLABUS FOR B.E. V-SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks:50	Course Code: **UII20PC531CS**
Credits : 1	CIE Marks:30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 Understand issues and techniques involved in the creation of intelligent systems	1 Design python programs for various learning algorithms. 2 Identify and apply machine learning algorithms to solve real world problems. 3 Implement uninformed and informed search to solve the search problems. 4 Implement the Game playing algorithm such as Minimax and AlphaBeta pruning 5 Build Neural network to solve classification problems.

Programming Exercise:

- Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a CSV file.
- Write a program to implement k-Nearest Neighbor algorithm to classify the iris dataset. Print both correct and wrong predictions Python MLlibrary classes can be used for this problem.
- Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.

- Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using k-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering. You can addPython ML library classes/API in the program.
- Write a machine learning program for the perception model and calculate the Error for the back propagation.
- Implement an AI program on Uninformed search algorithm Breadth first search, Depth First search ,IDFS.
- Implement an AI program for Water jug problem.
- Implement an AI program on 8-Puzzle problem using A*
- Implement an AI program on 8-queens problem.
- Implement an AI program for Alpha beta pruning.
- Implement an AI Program for the TIC TACTOE using minimax method.
- Implement an AI program for missionaries and cannibals Problem.

Learning Resources:

1. Tom Mitchell, "Machine Learning", McGraw-Hill Science, First edition.
2. Stuart Russell, Peter Norvig, Artificial Intelligence – A Modern Approach, Third Edition (2015),
3. Daniela Witten, Gareth James, Robert Tibshirani, and Trevor Hastie, An Introduction to Statistical Learning with Applications in R (Springer Texts in Statistics).
4. George F Luger , Artificial Intelligence, Structures and strategies for Complex Problem Solving, Sixth Edition,(2009), Pearson
5. Elaine Rich, Kevin Knight, Shivashankar B Nair, Artificial Intelligence, Third Edition(2009), Tata McGraw Hill
6. http://www.nptel.ac.in/courses/106105077
7. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-034-artificial-intelligence-spring-2005
8. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-034-artificial-intelligence-fall-2010/lecture-videos

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)
SCHEME OF INSTRUCTION AND EXAMINATION(R-20)
FOR B.E 2020-21 ADMITTED BATCH VI SEMESTER (A.Y 2022-23)

B.E CSE (AI&ML) VI 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								
UII20PC610CS	Full Stack Web Development	3	-	-	3	60	40	3
UII20PC620CS	Software Engineering	3	-	-	3	60	40	3
UII20PC630CS	Deep Learning	3	-	-	3	60	40	3
UII20PE6X0CS	Professional Elective – I	3	-	-	3	60	40	3
UII20OE6XXXX	Open Elective-IV	3	-	-	3	60	40	3
UII20HS430EH	Skill Development Course-VII (Verbal Aptitude)	1	-	-	2	40	30	1
UII20PE610CS	Skill Development Course -VIII (Technical Skills –III)	1	-	-	2	40	30	1
PRACTICALS								
UII20PC611CS	Full Stack Web Development Lab	-	-	2	3	50	30	1
UII20PC621CS	Software Engineering Lab	-	-	2	3	50	30	1
UII20PC631CS	Deep Learning Lab	-	-	2	3	50	30	1
UII20PW619CS	Theme Based Project	-	-	2	3	50	30	1
	TOTAL	**17**	**0**	**8**		**580**	**380**	**21**
	GRAND TOTAL	**25**				**960**		
Student should acquire one online course certification equivalent to two credits during III Sem to VII Sem								
Left over hours are allocated for Co-Curricular Activities, Sports / Library / Mentor Interaction / CC /RC / TC								

		Professional Electives –Stream					
		Big Data Analysis		Computing and Security		Applications	
		Course Code	Course Code	Course Code	Title	Course Code	Title
Sem -VI	PE -I	UII20PE510CS	Predictive Analysis	UII20PE 520CS	Computer Vision	UII20PE530CS	Internet of Things

With effect from the Academic Year 2022-23

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

Department of Computer Science & Engineering

FULL STACK WEB DEVELOPMENT
SYLLABUS FOR B.E. VI-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **UII20PC610CS**
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 Develop web applications using technologies like HTML, XML, JavaScript, Servlet, JSP & PHP.	1 Apply HTML, CSS & JavaScript to design web pages.
2 Develop and publish web services.	2 Develop applications using JDBC API to connect to a database. Design XML documents and apply styles using XSLT. 3 Explain architectural styles and develop dynamic web applications using Servlets. 4 Design and develop server side programs using JSP & PHP. 5 Publish web services and explain serverless computing.

UNIT-I:
Web Basics and Overview: Evolution of the Internet and World Wide Web, Web Basics, Introduction to HTML5, HTML5 Validation Service, Forms, HTML5 Form input Types, Cascading Style Sheets (Part-1).
JavaScript: Introduction to Scripting Functions, Arrays, Objects.

UNIT-II:
XML: XML Basics, XML Document Structure, XML Namespaces, XSL Transformations.
Working with JDBC 4.0: JDBC Drivers, JDBC Processes with java.sql package: Types of Statements, Retrieving Meta information from Database and ResultSet.

JDBC Processes with javax.sql package: JDBC Data Sources, Connection Pooling, Working with Transactions.

UNIT-III:

JavaEE Platform: Enterprise Architecture Types, JavaEE7 Architecture, Micro services Architecture

Working with Servlet 3.1: Java Servlet API, Servlet Life Cycle, Servlet Implementation, Request and Response Scope.

Handling Sessions: Approaches to Session Tracking, Session Tracking with Java Servlet API.

UNIT-IV:

JSP: Introduction to JSP, Architecture, JSP Lifecycle, JSP Elements: Directives, Scripting Elements, Action Tags, JSP Expression Language.

JSP Tag Extensions: Tag Extensions, Tag Extension API, Writing Tag Handlers.

PHP: Introduction, Conversion between Data Types, Arithmetic Operators, Manipulating Arrays, String Processing, Form Processing and Business Logic, Reading from Database, Using Cookies.

UNIT-V:

Web Services: Web Services Technologies - SOAP, REST, JSON, Web Services Architecture, Publishing and Consuming SOAP-Based WCF Web Service, Publishing and Consuming REST-Based XML Web Service, Publishing and Consuming REST- Based JSON Web Service. Web RTC

Serverless Computing: AWS services, AWS Lambda, Use-Cases, Web application Deployment in Cloud.

Learning Resources:

1. Paul J. Deitel, Harvey M. Deitel, Abbey Deitel, Internet & World Wide Web How to Program, 5th Edition, Pearson Education.
2. David R. Heffelfinger, Java EE 8 Application Development, Packt Publishers, 2017
3. Java Server Programming Java EE7 (J2EE 1.7): Black Book, (2014), Dreamtech Press.
4. Uttam K. Roy, Web Technologies, (2012), Oxford Publishers.
5. Robert W. Sebesta, Programming the World Wide Web, 7th Edition (2014), Pearson Education.
6. https://www.w3schools.com/html/
7. https://javaee.github.io/tutorial/toc.html
8. https://www.javatpoint.com/php-tutorial
9. https://docs.microsoft.com/en-us/aspnet/web-forms/index

10. https://aws.amazon.com/lambda/
11. https://webrtc.org/

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 : 1 Hour 30 Minutes

With effect from the Academic Year 2022-23

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

Department of Computer Science & Engineering

SOFTWARE ENGINEERING

SYLLABUS FOR B.E. VI-SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks : 60	Course Code:**UII20PC620CS**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 Understand the concepts involved in the lifecycle of software development 2 learn the best practices to be employed for the design, development, testing and maintenance of a software project	1 Explain the software development lifecycle models for a software system development. 2 Build the prototype for software business case and estimate the cost for software project development. 3 Analyze the behavioral and architectural models using UML for the designed object oriented system. 4 Design the behavioral and architectural models using UML. 5 Identify verification and validation methods in a software engineering project and implement testing methods at various phases of SDLC

UNIT-I:

Introduction to Software Engineering

The Nature of Software: Defining Software, Software Application Domain, Legacy Software, The changing Nature of the software : WebApps, Mobile Applications, Cloud Computing, Product line software

Software Engineering : The Process Frame work, Umbrella Activities, Process Adaption, Software development myths

The Software Process: Defining framework activities, Identifying a task set, Process patterns, Process Assessment and improvement

Process Models: Prescriptive models, Waterfall Model, Incremental Process Models, Evolutionary Process Models, Specialized Process Models, The Unified Process, personal software process, Team Software Process.

UNIT-II:

Agile Development: What is Agility, Agility and the cost of change, What is an Agile Process, Agile Process Extreme programming, SCRUM, Dynamic Systems Development Method, Agile Unified Process.

Requirements Engineering: Establishing the ground work, Eliciting requirements, Developing use cases, Building the Analysis model, Negotiating Requirements, Requirement Monitoring, Validating Requirements.

Design concepts: The Design Process, Design Concepts, The Design Model.

UNIT-III:

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

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

Behavioural Modelling: Interactions, Interaction diagrams, Use Cases, Use Case Diagrams, Activity diagrams, Events and Signals, Processes and Threads, State Machines, State chart Diagrams.

Architectural Modelling: Artifacts, Deployment, Collaborations, Artifact diagrams, Deployment diagrams.

UNIT-IV:

Testing Strategies: A Strategic approach to software testing ,Strategic issues, Test strategies for Object Oriented Software, Test strategies for WebApps, Test strategies for MobileApps, Validation testing, System testing, the art of debugging.

Testing Conventional Applications: Software testing fundamentals, Black box and White box testing, Basis path testing, Control Structure, O-O testing methods, Class level testing methods, Inter class test case design, Testing for specialized environments, architectures and Applications testing patterns.

UNIT-V:

Security Engineering: Analyzing Security Requirements, Security and Privacy in an Online World, Security Engineering Analysis, Security Assurance, Security Risk Analysis, Verification of Trustworthy Systems

Software Configuration Management : Software Configuration Management, The SCM Repository, The SCM process, Configuration Management for Web and Mobile Apps

Product Metrics: Software quality, A frame work for Product metrics , Metric for the analysis model, Metrics for the Design Model , Metrics for Source code, Metrics for testing, Metrics for maintenance

Learning Resources:

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, 8th Edition (2005), Tata McGrawHill.
2. Grady Booch, James Rumbagu, Ivor Jacobson, The Unified Modeling Language-User guide, (Covering UML 2.0) ,2nd Edition (2007), Pearson Education, India.
3. Shari Lawrence Pfleeger, Software engineering Theory and Practices, 4th Edition (2011), Pearson Education, India.
4. Pankaj Jalote, An Integrated Approach to Software Engineering, 3rd Edition (2005), Narosa Publishing House.
5. http://nptel.ac.in/courses/106101061/
6. http://freevideolectures.com/Course/2318/Software-Engineering
7. http://www.ece.rutgers.edu/~marsic/books/SE/instructor/slides/
8. https://ocw.mit.edu/courses/aeronautics-and-astronautics/16-355j-software-engineering-concepts-fall-2005/lecture-notes/

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 : 1 Hour 30 Minutes

With effect from the Academic Year 2022-23

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

Department of Computer Science & Engineering

DEEP LEARNING
SYLLABUS FOR B.E. VI-SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks : 60	Course Code:**UII20PE630CS**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVE	**COURSE OUTCOMES** *On completion of the course, students will be able to*
Understand issues and Techniques involved in the creation of Deep Learning Models.	1. Ability to understand the Concepts of Deep Feed forward Networks. 2. Identify the deep learning algorithms which are more appropriate for various types of learning tasks in various domains 3. Design deep learning systems by applying convolution, pooling operations in convolution neural network. 4. Implement sequence modelling algorithms to solve real-world problems. 5. Ability to apply Optimization strategies for large scale applications and GAN's.

UNIT I:
Introduction: Introduction to DL, Historical Trends in DL.
Deep Feed-forward Networks:Learning XOR, Gradient-Based Learning, Hidden Units, Architecture Design, Back Propagation and other differential Algorithms.

UNIT II:
Regularization for Deep Learning: Parameter Norm Penalties,Norm Penalties as constrained optimization,Regularization and under Constrained problem,Dataset Augmentation,Noise Robustness,Semi Supervised Learning,Multi Task Learning,Early stopping,Bagging and other ensemble methods,Dropouts.

UNIT III:

Convolutional Networks: The Convolution Operations, Motivation, Pooling, Convolution and Pooling as an infinitely strong prior, Variants of Basic Convolution Function, Structured outputs, Data Types, Efficient Convolution Algorithms, Random or unsupervised features.

UNIT IV:

Sequence Modelling: Recurrent and Recursive Nets: Unfolding Computational Graphs, Recurrent Neural Networks, Bidirectional RNNs, Encoder Decoder Sequence-to –Sequence Architecture, Deep Recurrent Networks, Recursive Neural Network.

UNIT V:

Optimization for Learning Deep Models: How learning Differs from pure optimization, Challenges in Neural Network Optimization, Basic Algorithms, Parameter initialization strategy, Algorithm with adaptive Learning Rates.

Introduction to Generative Adversarial Search (GAN's)

Learning Resources:

1. Ian Goodfellow, YoshuaBengio, Aaron Courville, Deep Learning: Adaptive Computations and Machine Learning Series, 2016 edition, An MIT Press Book
2. Eugene Charniak, Introduction to Deep Learning, 2019 Edition.
3. Kuntal Ganguly, Learning generative Adversarial Network Next Generation Deep Learning Simplifier, Packt Publications, 2017.
4. Nikhil Buduma, Nicholas Locascio, "Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithms", O'Reilly Media, 2017
5. Bishop, C. ,M., Pattern Recognition and Machine Learning, Springer, 2006
6. Raúl Rojas, Neural Networks : A Systematic Introduction, Springer, 1996
7. https://nptel.ac.in/courses/106106184
8. https://www.deeplearning.ai/program/deep-learning-specialization/
9. https://www.coursera.org/specializations/deeplearning?action=enroll&utm_campaign=WebsiteCoursesDLSTopButton&utm_medium=institutions&utm_source=deeplearningai
10. https://www.udemy.com/course/basics-of-deep-learning/
11. https://www.udemy.com/course/tensorflow-20-recurrent-neural-networks-lstms-grus/

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 : 1 Hour 30 Minutes

With effect from the Academic Year 2022-23

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

Department of Computer Science & Engineering

INTERNET OF THINGS

(Professional Elective-I)
SYLLABUS FOR B.E. VI - SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks : 60	Course Code: **UII20PE530CS**
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 Explore IoT technologies, architectures and standards. 2 Develop IoT solutions for a given problem	1 Describe IoT architecture. 2 Develop applications using Raspberry PI. 3 Apply wireless protocols to develop an IoT solution 4 Integrate IoT application with Cloud. 5 Recognize IoT opportunities in the industry.

UNIT-I:

Internet of Things (IoT) : Definition and Characteristics of IoT, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies, IoT Levels & Deployment, Sensors and Actuators, Envisioning the Internet of Things Era, Emergence of the IoT Platform as a Service (PaaS) ,Emerging IoT Flavors.

M2M and IoT Technology Fundamentals: Devices and Gateways, Local and Wide Area Networking, Data Management, Business Processes in IoT,Everything as a Service (XaaS), M2M and IoT.

UNIT-II:

Raspberry Pi: Board Components, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry Pi with Python. Arduino Uno Platform, Interfacing with Uno.

IoT Ecosystem Using Wireless Technologies : Architecture for IoT Using Mobile Devices, Mobile Technologies, 5G, Software-Defined Networking, Ultra Wide Band Technology, Near Field Communication Technology, Low Power Wide Area Networking Technologies – Sigfox, Weightless, LoRa.

UNIT-III: Infrastructure and Service Discovery Protocols for the IoT Ecosystem : Layered Architecture for IoT, Protocol Architecture of IoT, IEEE 802.15.4, IPv6 over Low-Power Wireless Personal Area Networks (6LoWPAN), Bluetooth Low Energy, Long Term Evolution-Advanced, RFID, Z-Wave, Zigbee, Device or Service Discovery for IoT- Bluetooth Beacons, Wi-Fi aware, Open Hybrid.

UNIT-IV:

Integration Technologies and Tools for IoT Environments : Sensor and Actuator Networks, Sensor-to-Cloud Integration, IoT Device Integration Concepts, Standards, and Implementations – Service Oriented Device Architecture, Device Profile for Web Services, Open Service Gateway Initiative (OSGi), REST Paradigm, Message Queue Telemetry Transport (MQTT), Advanced Message Queuing Protocol (AMQP), Constrained Application Protocol (CoAP).

Next-Generation Clouds for IoT Applications and Analytics : Hybrid and Federated Clouds, Edge or Fog Clouds, Software-Defined Clouds, Cognitive Clouds, Amazon Web services for IoT.

UNIT-V:

Industry 4.0: Industrial Internet of Things (IIoT), Reference Architecture, Characteristics of Industry 4.0.

Case Studies: Introduction, Smart Cities, Smart Homes, Smart Lighting, Smart Transportation, Industrial Automation, Smart Healthcare, Agriculture.

Learning Resources:

1. Pethuru Raj and Anupama C. Raman , “The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press.
2. ArshdeepBahga, Vijay Madisetti, “Internet of Things: A Hands-on Approach”, Universities Press, 2014.
3. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, “From Machine-to-Machine to

the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.
4. Srinivasa K.G., Siddesh G.M., Hanumantha Raju R., "Internet of Things", 1st Edition, Cengage, 2018.
5. "IoT Fundamentals: Networking Technologies, Protocols and Use Cases for the Internet of Things", Pearson, 2017.
6. Jean-Philippe Vasseur, Adam Dunkles, "Interconnecting Smart Objects with IP", Morgan Kaufmann, 2010.
7. Peter Waher**, "**Learning Internet of Things", PACKT Publishing, 2015.
8. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", Springer
9. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", Wiley Publications.
10. https://www.postscapes.com/internet-of-things-protocols/
11. https://nptel.ac.in/courses/106105166/

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 : 1 Hour 30 Minutes

OPEN ELECTIVES OFFERED IN B.E. VI SEMESTER (2022-23)

Dept	Title Open Elective -IV	Code	Credits
Civil	Project Management	U20OE610CE	3
ECE	Internet of Things and Applications	U20OE610EC	3
	Introduction to Mobile Communications	U20OE620EC	3
EEE	Electrical Installation and Safety	U21OE610EE	3
Mech.	Additive manufacturing and its applications	U20OE610ME	3
	Alternative Fuels and Energy Systems	U20OE620ME	3
	Industrial Administration and Financial Management	U20OE630ME	3
H&SS	English for Competitive Examinations	U20OE610EH	3
	Critical Reasoning	U20OE610EH	3

With effect from the Academic Year 2022-23

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

DEPARTMENT OF CIVIL ENGINEERING

PROJECT MANAGEMENT (Open Elective-IV)
SYLLABUS FOR B.E. VI SEMESTER

L:T:P (Hrs./week):3: 0 : 0	SEE Marks:60	Course Code: **U20OE610CE**
Credits: 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. Learn the concept of project management along with functions and objectives. 2. Understand the various techniques used for project planning such as bar charts, CPM, PERT and crashing of networks. 3. Acquire knowledge on various types of contracts, tenders.	1. Understand the objectives, functions and principles of management in projects. 2. Practice the network techniques like CPM and PERT for better planning and scheduling of engineering works. 3. Analyse the importance of cost and time in network analysis and planning the work accordingly. 4. Knowledge on Contracts, Tenders, and Work orders related to the projects. 5. Interpret the concept of Linear Programming and solve problems by Graphical and Simplex methods.

UNIT-I

Significance of Project Management: Objectives and functions of project management, management team, principles of organization and types of organisation.

UNIT-II

Project Planning: Project Planning, bar charts, network techniques in project management - CPM Expected likely, pessimistic and optimistic time, normal distribution curve and network problems of PERT

UNIT-III

Time Cost Analysis: Cost time analysis in network planning, updating

UNIT-IV

Contracts: Introduction, types of contracts and their advantages and disadvantages, conditions of contracts, Introduction to Indian contract act.
Tender: Tender form, Tender Documents, Tender Notice, Work Order

UNIT-V

Linear programming and optimization Techniques: Introduction to optimization – Linear programming, Importance of optimization, Simple problems on formulation of LP, Graphical method, Simplex method.

Learning Resources:

1. Srinath L.S., PERT and CPM: Principles and Application, East-West Press, 2001.
2. Peret, F, Construction Project Management an Integrated approach, Taylor and Francis, Taylor and Francis Group, London & New York, 2009
3. Punmia B.C., and Khandelwal, PERT and CPM, Laxmi Publications, 2006.
4. http://nptel.ac.in/courses/

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

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

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

INTERNET OF THINGS AND APPLICATIONS (OPEN ELECTIVE-IV)
SYLLABUS FOR B.E. VI - SEMESTER (for other branches)

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: **U20OE610EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. The purpose of this course is to impart knowledge on IoT Architecture, practical constrains. 2. To study various protocols And to study their implementations	On completion of the course, students will be able to 1. Understand the Architectural Overview of IoT 2. Enumerate the need and the challenges in Real World Design Constraints 3. Compare various IoT Protocols. 4. Build basic IoT applications using Raspberry Pi. 5. Understand IoT usage in various applications.

UNIT - I : OVERVIEW

Introduction to IoT – Improving Quality of life.
IoT-An Architectural Overview, M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT.

UNIT - II : Real-World Design Constraints

Real-World Design Constraints- Introduction, Technical Design constraints-hardware is popular again, Data representation and visualization, Interaction and remote control. Power Management in IoT device, Power conditioning using energy harvesting.

UNIT - III : IOT PROTOCOLS

Introduction to MQTT, Quality of services in MQTT,standards and security in MQTT.
Introduction and implementation of AMQP, Implementation of CoAP and

MDNS.

UNIT - IV : Device for IoT

Choice of Microcontroller, Introduction to Raspberry Pi ,Features of Pi, Programming platform, Phython programming for Pi. Building basic IoT Applications using Raspberry Pi.

UNIT - V : IoT case studies

Smart Cities and Smart Homes, Connected Vehicles, Agriculture, Healthcare, Activity Monitoring.

Learning Resources:

1. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1 st Edition, Academic Press, 2014.
2. Peter Waher, "Learning Internet of Things", PACKT publishing, BIRMINGHAM – MUMBAI
3. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer
4. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118-47347-4, Willy Publications
5. https://nptel.ac.in/courses/106105166/5
6. https://nptel.ac.in/courses/108108098/4

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

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

Duration of Internal Tests: 90 Minutes

With effect from the Academic Year 2022-23

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

INTRODUCTION TO MOBILE COMMUNICATIONS

(OPEN ELECTIVE-IV)

SYLLABUS FOR B.E. VI - SEMESTER (for other branches)

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: **U20OE620EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To understand the technology trends changing from generation to generation. 2. To have an insight into the various propagation models and the effects of fading. 3. To understand the multiple access techniques and Mobile communication system specifications.	On completion of the course, students will be able to 1. Analyze various methodologies to improve the cellular capacity. 2. Identify various Propagation effects. 3. Identify the effects of fading and multi path propagation. 4. Categorize various multiple access techniques for Mobile Communications. 5. Analyze the specifications of GSM based Mobile Communication Systems.

UNIT - I:

Introduction to Wireless Communication Systems: Evolution of Mobile Radio Communications, Examples of Wireless Communications Systems, Trends in Cellular Radio and Personal Communication Systems.

The Cellular Concept – System Design Fundamentals: Introduction, Frequency Reuse, Channel Assignment Strategies, Handoff Strategies, Interference and System Capacity, Improving Coverage and Capacity in Cellular Systems.

UNIT - II:

Mobile Radio Propagation - Large Scale Path Loss: Introduction to Radio wave Propagation, Free Space Propagation Model, Reflection, Ground Reflection (Two-Ray) Model, Diffraction, Scattering.

UNIT - III:

Mobile Radio Propagation - Small Scale Fading and Multipath: Small Scale Multipath Propagation, Small – Scale Multipath Measurements, Parameters of Mobile Multipath Channels, Types of Small-Scale Fading, Rayleigh and Ricean Distributions.

UNIT -IV:

Multiple Access Techniques for Wireless Communications: Introduction, Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), Code Division Multiple Access (CDMA), Space Division Multiple Access (SDMA).

UNIT -V:

Wireless Systems and Standards: Global System for Mobile (GSM) – Services and features, System architecture, GSM Radio subsystem, channel types, Frame structure for GSM.

Learning Resources:

1. Theodore S. Rappaport, Wireless Communications Principles and Practices, 2nd edition, Pearson Education.
2. David Tse, Pramodh Viswanath, Fundamentals of Wireless Communication, 2005, Cambridge University Press.
3. Name of the course: Introduction to Wireless and Cellular Communications
4. Course url: https://swayam.gov.in/nd1_noc19_ee48/preview

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

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

Duration of Internal Tests: 90 Minutes

With effect from the Academic Year 2022-23

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ELECTRICAL INSTALLATION AND SAFETY
Open Elective-IV
SYLLABUS FOR B.E. VI SEMESTER

L: T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U20OE610EE**
Credits:3	CIE Marks: 40	Duration of SEE: 3Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
Have a fair knowledge about the fundamentals of wiring systems, electrical safety procedures, Estimation of lighting & Power loads.	1. Identify and choose the proper type wiring for domestic & industrial applications. 2. Identify and choose the proper type wiring Accessories for domestic & industrial applications. 3. Apply and implement the Electrical safety procedures for repairs & hazards. 4. Design and Estimate the domestic lighting installation. 5. Design and Draw the wiring layout for a big office building, electrical laboratory, big industry and big hotel with lift arrangement

Unit – I

Wiring Systems: Introduction, size of wires, standard wires, types of wires, CTC, PVC, Lead sheathed VIR, weather proof wires, flexible wires different types of cable wires – Types and Installation of House Wiring Systems or Methods of installing wiring.

Unit – II

Wiring Accessories: - Clips, screws -round blocks switch boards, sockets socket pins - CTS wiring - Installation of surface conduit wiring.Rigid conduits, flexible conduits – Conduit accessories - elbows bushings - reducers, conduit box saddles, PVC conduit wiring - Concealed wiring.

Unit – III

Safety Procedures: Distribution fuse boards - Main switches – Different types of fuses and fuse carriers, MCB, ELCB & MCCB. Safety procedures – Electric shock and first aid, causes for fire hazards in Electrical installations

Unit – IV

Estimation of Lighting: Estimation of domestic lighting installation service main - types of wire - specification - quantity of materials required for service main – estimation and selection of interior wiring system suitable to a given building - number of circuits - quantity of accessories required - estimates of materials for execution of the domestic wiring installation as per National Electrical act 2003.

Unit- V

Estimation of power loads: Power wiring installation - Drawing wiring layout for a big office building, electrical laboratory, big industry, big hotel with lift arrangement and a residential building with 2 bed room house.- estimation upto 20 kVA calculation of load current based on ratings of various equipment's to be installed - size of wire.

Suggested Books:

1. J.B.Gupta –A course in Electrical installation Estimating & costing-9th edition 2014, S.K.Kataria& Sons.
2. S.L.Uppal-Electrical Wiring ,Estimating& costing Electrical wiring.

Reference Books:

1. Balbir Singh-Electrical Drawing
2. Arora -Electrical wiring
3. BVS Rao -Maintenance and Operation of Electrical Equipment –Vol-I-TMH
4. S.Rao -Testing, Commissioning Operation & Maintenance of Electrical equipment -TMH

5. CRDargar -Electrical Installation design and drawing -New Asian publishers.

Online resources:

1. http://ocw.tufts.edu
2. http://ocw.upm.es
3. www.open.edu/openlearn/
4. http://nptel.ac.in/courses/

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

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

Duration of Internal Tests : 90 Minutes

With effect from the Academic Year 2022-23

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

Additive Manufacturing and its Applications (Open Elective-IV)
SYLLABUS FOR B.E VI Semester

Instruction: 3 Hours / week	SEE Marks:60	Course Code: **U20OE610ME**
Credits: 3	CIE Marks:40	Duration of SEE : 3 Hours

Course objectives	Course Outcomes
The objectives of this course are to: understand the fundamentals of various additive manufacturing technologies and their applications in Engineering Industry.	On completion of the course the student will be able to: 1. Understand the fundamentals of prototyping and the various data formats used in Additive Manufacturing. 2. Study the principle, process, advantages, limitations and case studies of liquid based AM systems. 3. Study the principle, process, advantages, limitations and case studies of solid based AM systems. 4. Study the principle, process, advantages, limitations and case studies of powder based AM systems. 5. Study the applications of AM in various engineering industries as well as the medical field.

Unit-I

Introduction, Prototyping fundamentals, Historical development, Advantages of AMT, Commonly used terms, **Fundamental Automated Processes,** process chain, 3D modeling, Data Conversion, and transmission, Checking and preparing, Building, Post processing, RP data formats, **Newly Proposed formats,** Classification of AMT process.

Unit-II

Liquid based systems: Stereo lithography apparatus (SLA): Models and specifications, process, working principle, photopolymers, photo

polymerization, layering technology, laser and laser scanning, applications, advantages and disadvantages, case studies.
Solid ground curing (SGC): Models and specifications, process, working, principle, applications, advantages and disadvantages, case studies.

UNIT III

Solid based systems: Laminated object manufacturing (LOM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies.
Fused Deposition Modeling (FDM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies.

Unit-IV

Powder Based Systems: Selective laser sintering (SLS): Models and specifications, process, **materials,** working principle, applications, advantages and disadvantages, case studies.
Three dimensional printing (3DP): Models and specification, process, working principle, applications, advantages and disadvantages, case studies.

UNIT-V

Applications of AM systems: Applications in **Design,** aerospace industry, automotive industry, jewellery industry, coin industry, GIS Application, arts and architecture.
RP medical and bio engineering Application: planning and simulation of complex surgery, customized implant and prosthesis, design and production of medical devices, forensic science and anthropology, visualization of bio-molecules.

Learning Resources:

1. Chua C.K., Leong K.F. and LIM C.S Rapid prototyping: Principles an Applications, World Scientific publications, 3rdEd., 2010
2. D.T. Pham and S.S. Dimov, “Rapid Manufacturing”, Springer, 2001
3. Terry Wohlers, “ Wholers Report 2000”, Wohlers Associates, 2000
4. Paul F. Jacobs, “ Rapid Prototyping and Manufacturing”–, ASME Press, 1996
5. Ian Gibson, Davin Rosen, Brent Stucker “Additive Manufacturing Technologies, Springer, 2nd Ed, 2014.

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

Duration of Internal Tests: 90 Minutes

With effect from the Academic Year 2022-23

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

Alternative Fuels and Energy Systems (Open Elective-IV)
SYLLABUS FOR B.E VI Semester

Instruction: 3 Hours / week	SEE Marks:60	Course Code : **U20OE620ME**
Credits: 3	CIE Marks:40	Duration of SEE : 3 Hours

Course objectives	Course Out comes
The objectives of this Course are: To broaden the knowledge of alternate fuels and energy system and to understand the manufacturing and operating characteristics of alternative fuels.	On completion of the Course, the student will be able to: 1. Identify the need for alternative fuels. 2. Explain the characteristic features of bio-fuels. 3. Elucidate the properties of biogas, LPG & CNG. 4. Identify the merits and challenges of hydrogen and fuel cell based vehicles. 5. Explain the characteristics of electric and hybrid vehicles.

UNIT – I
Need for Alternative Fuels:
Working of I.C. Engine; Properties of Fuels; Fuel Rating; Study of various performance parameters related to properties of different types of fuels; Fossil Fuels: Sources, scope of availability; Need for Alternative Fuels; Effects of constituents of Exhaust gas emission on environment; Green house effect, Factors affecting green house effect.

UNIT – II
Alcohols:
Sources of Methanol and Ethanol, methods of it's production. Properties of methanol & ethanol as engine fuels, Use of alcohols in S.I. and C.I. engines, performance of blending methanol with gasoline. Emulsification of alcohol and diesel. Dual fuel systems. Improvement / Change in emission characteristics with respect to % blending of Alcohol.

Bio-diesels:
Base materials used for production of Bio-diesel; Properties of Diesel blended with vegetable oils and difference in performance characteristics of Engine.
Synthetic Alternative Fuels: Di-Methyl Ether **(**DME), P-Series, Eco-friendly Plastic fuels (EPF).

UNIT – III
Biogas:
Introduction to Biogas system; Extraction process; Factors affecting biogas formation; Usage of Biogas in SI engine & CI engine;
LPG & CNG: Properties of LPG & CNG as engine fuels, fuel metering systems, combustion characteristics, effect on performance, emission, cost and safety.

UNIT – IV
Hydrogen:
Hydrogen as a substitute fuel; Properties, Sources and methods of Production of Hydrogen; Storage and Transportation of hydrogen; Advantages of hydrogen (Liquid hydrogen) as fuel for IC engine/ hydrogen car; Layout of a hydrogen car;
Fuel Cells: Concept of fuel cells based on usage of Hydrogen and Methanol; Power rating and performance; Layout of fuel cell vehicle.

UNIT – V
Electric & Hybrid Vehicles:
Layout of an electric vehicle; Systems and components; electronic controlled systems; high energy and power density batteries; Types of hybrid vehicles; advantages & limitations.
Solar Powered Vehicles:
Solar cells for energy collection, Storage batteries; Layout of solar powered automobiles; Advantages and limitations.

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

No. of Internal Tests:	02	Max.Marks for each Internal Test:	30
No. of Assignments:	03	Max. Marks for each Assignment:	05
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 2022-23

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

Industrial Administration and Financial Management
(Open Elective-IV)

SYLLABUS FOR B.E VI Semester

Instruction: 3 Hours / week	SEE Marks:60	Course Code : **U20OE630ME**
Credits: 3	CIE Marks:40	Duration of SEE : 3 Hours

Course objectives	Course Out comes
The objectives of this course are to: 1. aware about types of business forms, organization structures, plant layouts, merits, demerits and applications. 2. understand method study procedure, PME, time study techniques and wage incentives. 3. importance of PPC and improving quality by control charts and sampling plants. 4. optimization of inventory to minimize total cost and other optimization techniques like LPP, project management techniques. 5. estimate selling price of a product, TVM and budgeting techniques, depreciation methods.	*On completion of the course, the student will be able to:* 1. understand business forms, organization structures and plant layouts. 2. implementation of method study and estimation of standard time. 3. understand types of production, functions of PPC, quality control by charts and sampling. 4. implement optimization techniques like LPP, assignment and project management techniques. 5. understand BEA, estimation of depreciation, selling price of a product and capital budgeting techniques.

UNIT – I

Industrial Organization : Types of various business organisations. Organisation structures and their relative merits and demerits. Functions of management.

Plant location and layouts: Factors affecting the location of plant and layout. Types of layouts and their merits and demerits.

UNIT – II

Work study: Definitions, Objectives of method study and time study. Steps in conducting method study. Symbols and charts used in method study. Principles of motion economy. Calculation of standard time– by– time

study and work sampling. Performance rating factor. Types of ratings. Jobs evaluation and performance appraisal. Wages, incentives, bonus, wage payment plans.

UNIT – III

Inspection and quality control: Kinds and Types, objectives of inspection, Sampling inspection quality control by chart and sampling plans. Quality circles.

Production planning and control: Types of manufacture. Types of production. Principles of PPC and its functions.

UNIT – IV

Optimisation: Introduction to linear programming and graphical solutions. Assignment problems.

Project Management: Introduction to CPM and PERT. Determination of critical path.

Material Management: Classification of materials. Materials planning. Purchasing procedure of a material for an industry Duties of purchase manager and Stores department. Determination of economic order quantities. Types of materials purchase.

UNIT – V

Cost accounting: elements of cost. Various costs. Types of overheads, calculation of selling price. Break even analysis and its applications. Depreciation. Methods of calculating depreciation fund. Nature of financial management. Time value of money. Techniques of capital budgeting and methods.

Learning Resources:

1. Pandey I.M., "Elements of Financial Management", Vikas Publ. House, New Delhi, 1994
2. Khanna O.P., "Industrial Engineering and Management", Dhanapat Rai & Sons.
3. Everrete E Admaa & Ronald J Ebert , "production and Operations Management", 5th Ed. , PHI , 2005
4. S N Chary, "Production and Operations Management", 3rd Ed. , Tata McGraw Hill, , 2006
5. Pannerselvam, "production and Operations Management", Pearson Education, 2007

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 2022-23

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
(OPEN ELECTIVE) - B.E 3/4 -VI SEMESTER

ENGLISH FOR COMPETITIVE EXAMINATIONS
(Common to all branches)

L:T: P (Hrs/Week):3	SEE Marks:60	Course Code: **U20OE610EH**
Credits: 3	CIE Marks:40	Duration of SEE:Hours:03

COURSE OBJECTIVES	**COURSE OUTCOMES**
The course will enable the students to:	**On completion of the course, students will be able to:**
To familiarise the students to various types of competitive examinations.	1. The student will be able to solve various types of questions in competitive English examinations effectively.
To practice questions and prepare for GATE, GRE, CAT, TOEFL.	2. Provide logical conclusions for the questions on aptitude and reasoning within the stipulated time.

GATE :

- Concentrating on English grammar
- Recognizing suitable option in sentence completion
- Solving verbal analogies
- Categorizing word groups
- Ignoring distractions in critical reasoning questions
- Providing reasoning in verbal deduction

GRE :

VERBAL REASONING:

- Analysing and drawing add value to incomplete data; identify the perception of the author
- Identifying vital points and differentiating between relevant and irrelevant points
- Understanding and summarising the structure of a text

- Understanding the given words, sentences and entire texts; ability to focus on the meaning of the entire sentence
- Understanding relationships among words and concepts

ANALYTICAL WRITING:

- Articulating complex ideas effectively and with clarity
- Supporting ideas with relevant reasons and examples
- Examining claims and accompanying evidence
- Sustaining a well-focused, coherent discussion

CAT :

VERBAL ABILITY AND READING COMPREHENSION:

- Reading comprehension (antonyms/synonyms)
- Sentence correction
- Fill in the blanks & cloze passage
- Jumbled sentences
- Jumbled paragraph (word meaning based questions)
- Analogies
- Para odd one out
- Summary (facts, assumptions, judgements
- Verbal reasoning (paragraph formation)

TOEFL:

- Basic understanding, speed and accuracy, learning from reading, pronoun reference, author's point of view.
- Good delivery including clarity of speech, fluidity, natural pacing and correct intonation patterns.
- Correct use of language showing a good grasp of grammar, vocabulary and speech structures.
- Topic development in which you are able to show a well-structured. organized response that effectively connects ideas with enough support for each point you are making.
- Writing strategy and format execution skills.

METHODOLOGY ASSESSMENTS

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

LEARNING RESOURCES

- learn.talentsprint.com

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 Tests: 90 Minutes

With effect from the Academic Year 2022-23

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES
(OPEN ELECTIVE) - B.E 3/4 -VI SEMESTER

CRITICAL REASONING

L:T: P (Hrs/Week):3	SEE Marks:60	Course Code: **U20HS610EH**
Credits: 3	CIE Marks:40	Duration of SEE:Hours:03

COURSE OBJECTIVES	**COURSE OUTCOMES**
The course will enable the learners to:	**At the end of the course the learners will be able to: -**
1. Identify the alternative solutions to the problem or case. 2. Derive solution or discuss the best solution(s) to the problem or case. 3. Discuss the conclusions that follow from the solution(s). Students will be trained to apply concepts like percentages and averages to solve complex problems. 4. Students will be trained to use effective methods like elimination of options and shortcuts to solve problem accurately. 5. Students will be trained to use effective methods like decision making and shortcuts to solve problems accurately.	1. Analyse and use techniques for Venn diagrams to solve questions effectively. 2. Demonstrate the difference between deductive and inductive reasoning. 3. Evaluate and distinguish between strong and weak assumption and conclusions. 4. 4. Evaluate a select the right arguments from the given statements. 5. 5. Evaluate and choose the right decision for the given situation

Unit- 1 Analyzing Datasets & Puzzles with Analytical Thinking

1.1 Set Theory/Data Sets/Venn Diagrams
1.2 Analogy
1.3 Classifications

Unit- 2 Logical Reasons & Logical Deductions

2.1 Analytical Puzzles
2.2 Logical Data Sequences
2.3 Logical Fact Deductions
2.4 Assertions & Reasons

Unit- 3 Essentials, Reactions, Causes & Data Adequacies/ Inadequacies

3.1 Essential Part/Verification of Truth of Statements
3.2 Situation Reaction Test
3.3 Cause & Effect
3.4 Data Sufficiency

Unit- 4 Statements, Assumptions, Arguments & Conclusions

4.1 Statements & Assumptions
4.2 Statements & Arguments/Inferences/Analyzing Arguments
4.3 Statements & Conclusions
4.4 Analytical Reasoning

Unit- 5 Evaluations, Decisions & Making Judgements

5.1 Decision Making
5.2 Making Judgements
5.3 Evaluating Course of Action

Prescribed textbook for theory:

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

Suggested Reading

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

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

1	No. of Internal tests	:	2	Max.Marks	:	30
2	No. of assignments	:	3	Max. Marks	:	5
3	No. of Quizzes	:	3	Max. Marks	:	5

Duration of Internal Tests : 90 Minutes

With effect from the Academic Year 2022-23

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

Skill Development-VII (Verbal Aptitude)

SYLLABUS FOR B.E. VI-SEMESTER

L:T:P(Hrs/Week):1	SEE Marks:40	Course Code: **UII20HS430EH**
Credits: 1	CIE Marks :30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
This course aims at enhancing employability skills:	At the end of the course students will be able to:
Students will be introduced to higher order thinking and problem solving in the following areas - Vocabulary, Fill in the Blanks, Passage Based Questions, Jumbles & Spotting the Errors	Solve questions in Verbal Ability in the mentioned areas using shortcuts and smart methods
Students will be trained to work systematically with speed and accuracy while problem solving	Solve questions with speed and accuracy.
Students will enhance their vocabulary and use it effectively to solve problems	Clear the Verbal Ability Section in Employment Eligibility Tests

Unit 1: Vocabulary- Reading for Content and Context

Overview:

This course is designed for students to not just understand the importance of vocabulary but also to build on it by using the appropriate tools and methods. After which they will be able to solve vocabulary based questions and also use vocabulary as a tool to solve problems.

Learning Outcomes

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

1. Use context to find the meanings of words
2. Possess better vocabulary
3. Use vocabulary as a tool to solve questions in verbal ability

Competencies

1. Understand Collocations
2. Build on words by using Root Words
3. Understand how prefixes and suffixes work
4. Identify incorrect usage of words

Sessions

1.1 Concepts & Context Rules: Collocations & Phrasal Verbs
1.2 Prefixes/ Suffixes & Root Words
1.3 Phrases & Idioms; Questions based on it
1.4 One Word Substitution; Questions based on it
1.5 Antonyms, Synonyms & Incorrect Word Usage

Unit 2: Fill in the Blanks- Applying Content and Context

Overview:

This course is designed for students to identify the clue/ theme words in sentences, then understand the context in which the words are used and finally apply concepts like collocation, antonyms, and synonyms to solve questions.

Learning Outcomes

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

1. Identify the theme/ clue words in sentences
2. Solve Single & Double Fill in the blank questions
3. Solve Cloze tests by applying collocations and contextual vocabulary

Competencies

1. Use contextual vocabulary to solve problems
2. Apply vocabulary based tools
3. Apply tricks to solve questions

Sessions

2.1 Concepts & Rules: Single Fill in the Blanks
2.2 Double/ Triple Fill in the Blanks
2.3 Cloze Test

Unit 3: Jumbles

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 sentence or passage and the transition words associated with each pattern, recognizing the relationships between words and sentences, identifying and using context clues to determine the meanings of words, identifying logical inferences and conclusions.

Learning Outcomes

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

1. Identify the structure of sentences & paragraphs
2. Apply tools of vocabulary and context to organize content
3. Solve questions on jumbled sentences & parajumbles

Competencies

1. Identify the author's purpose, point of view, tone, and method of development.
2. Use tools of language and logic to solve problems
3. Synthesize information given into logically correct sentences or passages

Sessions

3.1 Concepts- Purpose, Tone, Point of view
3.2 Parajumbles
3.3 Jumbled Sentences

Unit 4: Critical Reading Skills

Overview:

Research shows that good reading skills can lead to well written assignments. In this unit, students will learn, develop and improve reading and study skills needed for college work. Building on these basic strategies, students will develop skills to critically analyze texts and then the ability to identify its theme.

Learning Outcomes

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

1. Read a given text critically and propaganda techniques
2. Use contextual Vocabulary to find out meanings of new words
3. Use comprehension and vocabulary strategies to raise reading rate.

Competencies

1. Analyze text, e.g., simple outlining and note taking, summarize, draw conclusions, and apply information to personal experiences.
2. Increase speed of reading
3. Solve Reading Comprehensions using elimination strategies
4. Identify the theme of the passage

Sessions

4.1 Concepts- Basic Introduction & Short Passages
4.2 Article & Article Based Passages
4.3 Theme Detection

Unit 5: Spotting the Errors

Overview:

In this unit students will focus on identifying errors in sentences, rectifying them and improving the quality of sentences. Building on these skills will also have an impact on the written and spoken skills of students since they will be aware of the common and often made errors and therefore be able to avoid them while using language.

Learning Outcomes

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

1. Read, identify and rectify errors in sentences
2. Improve the quality of sentences by fixing errors
3. Use comprehension and vocabulary strategies to raise reading rate.

Competencies

1. Analyze language and improve its quality
2. Apply tips and tricks to solve questions faster
3. Improve the quality of their writing by being aware of the common errors

Sessions

5.1 Concepts- Basic Introduction & Sentence Fillers
5.2 Spot the Errors
5.3 Sentence Improvement

METHODOLOGY	**ASSESSMENTS**
- Demonstration - Presentations - Expert lectures - Writing and Audio-visual lessons	- Online assignments - Individual and Group

Learning Resources:

learn.talentsprint.com

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

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

Duration of Internal Tests : 1 Hour 30 Minutes

With effect from the Academic Year 2022-23

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

Department of Computer Science & Engineering

Skill Development Course-VIII (Technical Skills-III)

Industry Standard Coding Practices – 2023
SYLLABUS FOR B.E. VI-SEMESTER

L:T:P(Hrs./week):1:0:0	SEE Marks : 40	Course Code:**UII20PE610CS**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1. Understand importance of problem solving approaches for programming complex data structure problems. 2. Understand importance of optimized solutions for problems solving and its relevance to industry. 3. Implement mathematical and logical understanding approaches to implement test driven development practices. 4. Start participating in global coding competitions relevant to the syllabus 5. Write Efficient coding solutions using appropriate algorithm	1. Choose the right data structure based on the requirements of the problem. 2. Design algorithm for a given problem by choosing appropriate design technique and provide optimal solution.

Algorithms – Greedy Methods - II
Review of Greedy Strategies, Problem solving on greedy problems: Job sequencing solutions, Activity selection problem, Scenario based problem solving implementing Greedy Methods

Algorithms - Dynamic Programming - I
Introduction to Dynamic programming, Coding solutions to form Sub structures, Problem solving on Dynamic Knapsack, Trip optimization

problem, Scenario based problem solving using Dynamic Programming approaches, Coding solutions on Coin-change sub structure, Comparison of Greedy Vs DP for Coin change, Sum of sub sets problem

Algorithms - Dynamic Programming - II
Problem solving using Grid Memo, Problem solving on Longest Common Sub string, Longest Common subsequence, Minimum Edit Distance problems, Longest Increasing Sub sequences, Min sum path matrix, Max sum Sub square, Scenario based problem solving using Dynamic Programming approaches

Non-Linear Data structures – Graph Theory Introduction to Graphs Problems, Types of graphs, Problem solving on graph traversals, Checking the degree sequence, , DFS, BFS, Scenario based problem solving implementing graphs, Practice Problems

Non-Linear Data structures – Graph Algorithms
Problem solving on Graph Coloring, Introduction to DAG, Topological sorting on DAGs, Spanning Tree, Graph
Reduction, Kahn's Algorithm, Practice Problems

Backtrack Algorithms
Introduction to Backtracking, Differences between backtracking and brute force methods, State space diagram, N Queens problem, Finding a way, Solving Grid based backtracking problems, practice problems

String Algorithms
TRIE Data structure, Finite state machine for pattern matching, KMP algorithm, Example problem solving

Operating Systems
Operating Systems Overview, Process Management, CPU Scheduling algorithms, Deadlocks, Memory Management, Examples.

Networking
The OSI Model, The TCP/IP Model, Network typologies and Ethernet, Internet Protocol v4 and v6, Media Access Control and Address Resolution Protocols, IP Addressing, Examples.

Introduction to Java and Expressions and control Statements

Introduction to Java, Java Setup, first Java program, Variable and data type, Primitive Data Types, String basics, Type casting, Operators in Java, Control Statements: If Statements, Switch case, For loop, While loop, Do while loop, Break and continue, Nested loops, Modulo operator, Methods parameters and return type, Method overloading, Naming convention, BigDecimal class

Object Oriented Programming Through Java - 1

Orientation to Object oriented programming, Classes, Constructors, introducing inheritance, Type of inheritance, Composition Introduction Encapsulation, Polymorphism, Concepts of Java: Interfaces, Abstract class, Example Problems

Object Oriented Programming Through Java - 2

Introduction, Multiple inheritance using interfaces, Inner classes, Types of nested class, Local inner class, Anonymous object, Anonymous inner class, Advantages of inner class, User input, Static elements, Final keyword, Final keyword with method and class, Packages, Access modifier

Exception Handling through Java

Introduction to Exception handling, Multiple catch blocks, Finally block, Throw and throws, User defined exception, Checked and unchecked exceptions

Strings through Java

Introduction to Strings, Difference between String literal and String Object, String methods, String formatting, String functions, manipulating strings, example problems

DBMS

Introduction to DBMS, SQL Queries, ER And Relational Models, Data Definition And Querying, Transactions
And Concurrency, Normalization, case studies, Example Problems.

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

1	No. of Internal Tests	:	1	Max. Marks for each Internal Test	:	30

Duration of Internal Tests : 1 Hour 30 Minutes

With effect from the Academic Year 2022-23

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

Department of Computer Science & Engineering

FULL STACK WEB DEVELOPMENT LAB

SYLLABUS FOR B.E. VI - SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks : 50	Course Code: **UI20PC611CS**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 Develop web applications.	1 Design a website using HTML, CSS, XML & JavaScript
2 Publish web services.	2 Develop dynamic web applications using Servlets.
	3 Develop dynamic web applications using JSP's, PHP with DB connectivity.
	4 Create and publish Web Services.
	5 Develop and deploy web application on to the cloud

Programming Exercise:

1. Creation of Static Web Site using HTML.
2. Creation of Static Web Site using HTML Forms.
3. Apply CSS to the Static Web Site.
4. Validation of Static Web Site using Java Script.
5. Providing data store support using JDBC.
6. Creation of dynamic content in a Web Site using Servlets.
7. Demonstration of Servlet Collaboration in Web Applications.
8. Demonstrate Session handling in Web Applications using Cookies.
9. Demonstrate Session handling in Web Applications using HttpSession.

10. Creation of dynamic content in a Web Application using JSP.
11. Creation of dynamic content in a Web Application using PHP.
12. Publishing and Consuming a Web Service using SOAP.
13. Publishing and Consuming a Web Service using REST.
14. Develop a web application and deploy on to the cloud.
15. Develop a web application for given problem statement.

Learning Resources:

1. Paul J. Deitel, Harvey M. Deitel, Abbey Deitel, Internet & World Wide Web How to Program, 5th Edition, Pearson Education.
2. David R. Heffelfinger, Java EE 8 Application Development, Packt Publishers, 2017
3. Java Server Programming Java EE7 (J2EE 1.7): Black Book, (2014), Dreamtech Press.
4. Uttam K. Roy, Web Technologies, Oxford Publishers.
5. Robert W. Sebesta, Programming the World Wide Web, 7th Edition (2014), Pearson Education.
6. https://www.w3schools.com/html/
7. https://javaee.github.io/tutorial/toc.html
8. https://spring.io/docs
9. https://azure.microsoft.com/

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 2022-23

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

Department of Computer Science & Engineering

SOFTWARE ENGINEERING LAB

SYLLABUS FOR B.E. VI-SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks :50	Course Code: **UII20PC621CS**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 Apply software engineering principles for analyzing, visualizing, specifying, constructing for software intensive system. 2 Document the artifacts of software system.	1 Identity the functional and non functional requirements and estimate effort /cost for the given system. 2 Design the Data/Work/Control flow in the modules of the intended system. 3 Construct the Structural, Behavioural, Interaction & State aspects for the intended system. 4 Develop the artifacts of the intended system through forward and reverse engineering. 5 Build test cases and evaluate the software project quality.

Programming Exercise:
Select one large information system/Approach and device the following using CASE TOOL.

1. Systems software Requirements and related analysis documents as per the guidance in ANSI/IEEE Std 830-1984.
2. Design documents representing the complete design of the software system using Data flow diagram.
3. Functional Decomposition and structure.

4. Behavioral Modeling- use case diagram demonstration using UML.
5. Behavioral Modeling- Interaction diagram demonstration using UML.
6. Behavioral Modeling- State machine diagram demonstration using UML.
7. Structural Modeling- Class diagram demonstration using UML.
8. Familiarization of Forward and reverse engineering the class diagram using tools.
9. Architectural Modeling-component and deployment diagram demonstration using UML.
10. Familiarization of Software Configuration Management tool.
11. Test case Generation, Verification.
12. Demonstration on functional testing using RFT.
13. Build a design model for a given application.

Learning Resources:

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, 6th Edition, (2005) Tata McGrawHill.
2. Grady Booch, James Rumbagu, Ivor Jacobson, The Unified Modeling Language-User guide , 2nd Edition, (2007), Pearson Education, India.
3. James Rumbagu, Ivor Jacobson, Grady Booch, The Unified Modeling Language-Reference Manual, (2004), 2ndEdition, Pearson Education, India.
4. http://www.nyu.edu/classes/jcf/g22.2440-001_sp09/handouts/UMLBasics.pdf
5. https://courses.cs.washington.edu/courses/cse403/11sp/lectures/lecture08-uml1.pdf
6. http://www.conceptdraw.com/examples/online-uml-class-diagram-of-material-management-system

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 2022-23

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

Department of Computer Science & Engineering

DEEP LEARNING LAB

SYLLABUS FOR B.E. VI - SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks:50	Course Code : **UII20PC631CS**
Credits : 1	CIE Marks:30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
Understand issues and techniques involved in the creation of intelligent systems	1 Understanding basics of Deep Learning Libraries 2 Implement the real time applications. 3 Build a model for Classification. 4 Build a model to predict the real world applications using CNN. 5 Develop a model for prediction using RNN.

Programming Exercise:

1. Install and work on simple operations on python libraries like Tensorflow, Keras, PyTorch.
2. Human Face RecognitiononReal Time(Video) and Image(JPEG) using OpenCV and Haarcascade.
3. Data preprocessing techniques for training a deep learning model.
   Reading the Dataset, Handling Missing Data, Conversion to the Tensor Format
4. Building Python GUI Application with Tkinter.
5. Build a Model to binary classify a given image using deep learning model.
6. Apply dimensionality reduction techniques using PCA on dataset.
7. Develop a CNN for MNIST Handwritten Digit Classification.
8. Build a Model to classify the images of Clothing using Fashion MNIST Dataset.

9. Build a Model for Multi Class Classification for CIFAR-10 Dataset.
10. Build a Model to predict Stock Price Predictions using LSTM.

Learning Resources:

1. Ian Goodfellow, YoshuaBengio, Aaron Courville, Deep Learning: Adaptive Computations and Machine Learning Series, 2016 edition, An MIT Press Book
2. Nikhil Buduma, Nicholas Locascio, “Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithms”, O'Reilly Media, 2017
3. Eugene Charniak, Introduction to Deep Learning, 2019 Edition.
4. Michael Nielsen,“Neural Networks and Deep Learning”, Determination Press 2015
5. Bishop, C. ,M., Pattern Recognition and Machine Learning, Springer, 2006
6. Raúl Rojas, Neural Networks : A Systematic Introduction, Springer, 1996
7. https://nptel.ac.in/courses/106106184
8. https://www.deeplearning.ai/program/deep-learning-specialization/
9. https://www.coursera.org/specializations/deeplearning?action=enroll&utm_campaign=WebsiteCoursesDLSTopButton&utm_medium=institutions&utm_source=deeplearningai
10. https://www.udemy.com/course/basics-of-deep-learning/
11. https://www.udemy.com/course/tensorflow-20-recurrent-neural-networks-lstms-grus/

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 2022-23

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

Department of Computer Science & Engineering

THEME BASED PROJECT

SYLLABUS FOR B.E. VI-SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks : 50	Course Code:**UII20PW619CS**
Credits : 1	CIE Marks : 30	Duration of SEE : -

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
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 a theme based project by selecting any one of themes like Smart Home, Smart Parking, Smart Transport, Smart Waste Management, Smart Healthcare, Smart Agriculture, Smart Lighting, Smart Logistics and Smart Security in the area of Internet of Things or themes in any other area relevant to Computer Science.

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