

**VASAVI COLLEGE OF ENGINEERING  
(AUTONOMOUS)**

IBRAHIMBAGH, HYDERABAD-500 031

***ACCREDITED BY NAAC WITH A++ GRADE***

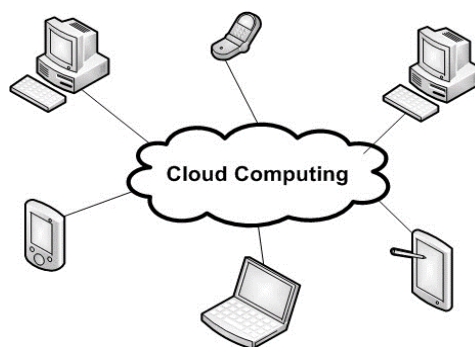
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**Sponsored by**

**VASAVI ACADEMY OF EDUCATION  
Hyderabad**



**SCHEME OF INSTRUCTION AND SYLLABI UNDER CBCS FOR  
B.E. (IT) V and VI Semesters with effect from 2022-2023  
(For the batch admitted in 2020-21)  
(R-20)**



**DEPARTMENT OF INFORMATION TECHNOLOGY**

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

**Vision**

Striving for a symbiosis of technological excellence and human values.

**Mission**

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

**Quality Policy**

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

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**Vision**

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

**Mission**

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



**VASAVI COLLEGE OF ENGINEERING  
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IBRAHIMBAGH, HYDERABAD-500 031**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**Programme Educational Objectives (PEOs) for IT Program**

The Programme will produce graduates

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

**Program Specific Outcomes (PSOs) for IT Program**

The Students will demonstrate

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

**Program Outcomes (POs) for IT Program**

At the end of the program, the graduates will demonstrate

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**SCHEME OF INSTRUCTION AND EXAMINATION (R-20)**  
**B.E. – INFORMATION TECHNOLOGY : FIFTH SEMESTER (2022 - 2023)**

<b>B.E (IT) V-SEMESTER</b>								
Course Code	Course Name	Scheme of Instruction			Scheme of Examination			
		Hours per week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
U20PC510IT	Data Communications and Computer Networks	3	1	-	3	60	40	4
U20PC520IT	Microprocessors & Interfacing	3	-	-	3	60	40	3
U20PC530IT	Operating Systems	3	-	-	3	60	40	3
U20PC540IT	Automata, Languages and Computation	3	-	-	3	60	40	3
U20OE5XXX	Open Elective - III	3	-	-	3	60	40	3
U20HS510EH	Skill Development Course – V :Communication Skills in English – II	1	-	-	2	40	30	1
U20XX510XX	Skill Development Course – VI : Technical Skills – II	1	-	-	2	40	30	1
<b>PRACTICALS</b>								
U20PC511IT	Computer Networks lab	-	-	2	3	50	30	1
U20PC521IT	Microprocessors & Interfacing Lab	-	-	2	3	50	30	1
U20PC531IT	Operating Systems Lab	-	-	2	3	50	30	1
U20PW519IT	Mini Project – II	-	-	2	3	50	30	1
	CCA-III : Paper Presentation	-	-	-	-	-	-	-
	ECA-II	-	-	-	-	-	-	-
	Library / Sports / Mentor Interaction	-	-	-	-	-	-	-
Student should acquire one online certification course equivalent to 2 credits during III-VII Semesters.								
	<b>Total</b>	<b>17</b>	<b>1</b>	<b>8</b>	-	<b>580</b>	<b>380</b>	<b>22</b>
	<b>Grand Total</b>	<b>26</b>			-	<b>960</b>		
<i>Note:</i>								
1. One hour is allotted to Library / Sports / Mentor Interaction.								
2. The left over hours are to be allotted to ECA-II / CCA-III / RC / CC / TC based on the requirement .								

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IBRAHIMBAGH, HYDERABAD – 500 031

**DEPARTMENT OF INFORMATION TECHNOLOGY****DATA COMMUNICATIONS AND COMPUTER NETWORKS**

Syllabus for B.E V-SEMESTER

L:T:P(Hrs./week): 3:1:0	SEE Marks :60	Course Code:U20PC510IT
Credits : 4	CIE Marks :40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The Objectives of the course:	<i>On completion of the course, students will be able to</i>
1. Introduce the fundamental concepts of Data Communications and computer networks. 2. Describe the layers, protocols and services in ISO-OSI and TCP/IP Models.	1. Compare ISO-OSI with TCP/IP models and understand data transmission in physical layer. 2. Examine various techniques and protocols of data link layer to enable node to node delivery. 3. Analyse different routing protocols and algorithms to enable end-to-end connectivity. 4. Analyse different transport layer protocols and congestion control mechanisms to enable process to process delivery. 5. Illustrate different application layer protocols including DNS, EMAIL, FTP, HTTP and SNMP.

**UNIT I:**

Introduction: Data communication, network applications, Data flow, network types, topologies, Protocols and standards, OSI and TCP/IP Protocol Suite.

Physical Layer: Introduction to Data and Signals, Transmission media (wired and wireless), Switching.

**UNIT II:**

Data Link Layer: Design issues, framing, error detection and correction, parity, LRC, CRC, hamming code, elementary data link protocols- Stop-and-wait, sliding window protocols.

Medium Access sublayer: ALOHA, CSMA/CD, LAN Standards: IEEE 802.3, IEEE 802.11.

**UNIT III:**

Network Layer: Network layer design issues, routing algorithms- Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, IPV4, IPV6, Internet, Internet Control protocols - ARP, RARP, DHCP.

**UNIT IV:**

Transport Layer: Process to Process Communication, User Datagram Protocol (UDP), Transmission Control Protocol (TCP), Congestion control algorithms, Quality of Service.

**UNIT V:**

Application Layer: Domain Name System (DNS), EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP.

**Learning Resources:**

1. Data Communication and Networking, 4th Edition, Behrouz A. Forouzan, McGrawHill.
2. Andrew S Tanenbaum, David J. Wetherall, Computer Networks, 5th Edition, Pearson, 2012.
3. Data and Computer Communication, 8th Edition, William Stallings, Pearson Prentice Hall India
4. James F. Kurose, Keith W. Ross, "Computer Networking, A Top-Down Approach Featuring the Internet", Sixth Edition, Pearson Education, 2012.
5. <https://nptel.ac.in/courses/106105183/25>
6. <http://www.nptelvideos.in/2012/11/computer-networks.html>
7. <https://nptel.ac.in/courses/106105183/3>

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

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	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 INFORMATION TECHNOLOGY**

**MICROPROCESSORS AND INTERFACING**  
SYLLABUS FOR V-SEMESTER

L: T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code: <b>U20PC520IT</b>
Credits: 3	CIE Marks :40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
The course will enable the students to understand the architectural features of 8085 and 8086 microprocessors and use them in assembly language programming and interfacing with different peripherals.	<ol style="list-style-type: none"> <li>1. Describe 8085 architecture features and write assembly language programs for 8085</li> <li>2. Summarize the 8086 architecture and its special architectural features and write assembly language programming for 8086</li> <li>3. Understand the architectures of 8255 and 8279 and design Interfacing circuits for memory and I/O.</li> <li>4. Explain the architectural features of 8259 and 8253, and design interfacing circuits and Understand DOS and BIOS function calls</li> <li>5. Describe architectural features of 8251 and 8257 and develop interfacing circuits.</li> </ol>

**UNIT – I:**

General definitions of microprocessors and microcontrollers, micro processor architecture and its operations, 8085 microprocessor Architecture and signal descriptions, 8085 instructions and addressing modes , Instruction cycle, machine cycle, T-states, counters and time delays, stacks and subroutines, assembly language programming examples

**UNIT – II:**

8086/8088 Architectures, pin diagrams and timing diagrams: Register Organization, Architecture, signal descriptions, physical memory organization, General bus operation, I/O Addressing capability, Minimum and Maximum mode of 8086 System and Timings.

8086/8088 Instruction set and assembler directives: Instruction formats, Addressing modes of 8086, Instruction set of 8086/8088, Assembler directives and operators, Assembly language programming with 8086/8088

Special architectural features and related programming: Stack, Stack Structure of 8086/8088, Interrupts and ISRs, Interrupt cycle, Maskable and Non maskable Interrupts, procedures and macros, Coprocessor.

**UNIT – III:**

Basic peripherals and their interfacing with 8086/8088: Semiconductor memory Interfacing, Dynamic RAM interfacing, Interfacing I/O ports, PIO 8255, modes of operation of 8255, Interfacing ADC, DAC, Stepper Motor, The Keyboard/ Display controller 8279, programming examples.

**UNIT – IV:**

Programmable Peripheral devices and their Interfacing with 8086: 8259A programmable interrupt controller, 8253 programmable interval timer, DOS and BIOS function calls.

**UNIT – V:**

Programmable communication Interface 8251 USART, DMA Controller 8257. DMA Transfers and operations, Introduction to advanced processors.

**Learning Resources:**

1. Ramesh S. Gaonkar, Microprocessor Architecture, Programming and Applications with the 8085, 5/E, Prentice Hall, 2002.
2. A.K.Ray and K.M.Bhurchandi, Advanced Microprocessors and peripherals 2<sup>nd</sup> edition Tata McGrawHill, 2006.
3. Douglas V. Hall, Microprocessors and Interfacing: Programming and Hardware, Tata McGraw- Hill Publishing Company Limited, 2006.
4. Barry B.Brey, The Intel Microprocessors 8086, 8088, 80188, 80186, 80286, 80386, 80486, and Pentium Processors, Pearson Education, 8<sup>th</sup> Edition, 2009.
5. I. Liu, G. A. Gibson, Microcomputer Systems: The 8086/8088 Family, 2nd Ed., Prentice Hall, 1986.
6. N. Sentil Kumar, M. Saravanan, S. Jeevananthan, S.K. Shah, Microprocessors and Interfacing, Oxford University Press, 2012.
7. <https://nptel.ac.in/courses/108105102/53>

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

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	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 INFORMATION TECHNOLOGY**

**OPERATING SYSTEMS**  
**Syllabus for B.E V- SEMESTER**

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : <b>U20PC530IT</b>
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The Objectives of the course:	<i>On completion of the course, students will be able to:</i>
1. Demonstrate the principles of modern operating systems and functionalities. 2. Discuss the services of major operating systems such as Windows and Linux.	1. Understand the functionalities of Operating System, Process, threads and evaluate CPU scheduling algorithms. 2. Apply contiguous & non- contiguous techniques for main memory management. 3. Design solutions for classical problems of synchronization and strategies for deadlock handling. 4. Implement techniques for file organization, I/O operation, and system protection. 5. Compare and contrast key features and functionalities of Windows and LINUX.

**UNIT-I: Introduction and Process Management:**

Operating System Functionalities, Types of Operating Systems, User Operating System Interface, System calls, System Boot. Process Concept: Overview, Threads. Process Scheduling - Uniprocessor scheduling algorithms, Multiprocessor and Real-time scheduling algorithms.

**UNIT-II: Memory Management:**

Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation. Virtual Memory Management: Demand Paging, Page replacement algorithms, Thrashing, Allocating Kernel Memory.

**UNIT-III: Process Synchronization:**

Inter Process Communication, Process Synchronization - Peterson's Solution, Bakery Algorithm, Semaphores, Critical Section, Monitors. Classical problems of synchronization. Deadlocks: Deadlock prevention, deadlock avoidance and Deadlock Detection and Recovery - Bankers Algorithm.

**UNIT-IV: Storage and I/O Management:**

File System-Basic Concepts, File System Structure, File System Mounting, Directory Structure, Allocation Methods, Free Space Management. I/O Management: Disk Structure, RAID Structure, Disk Scheduling, Protection :Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix.

**UNIT-V**

**Case Study: Windows 10** : Design Principles, System Components, Terminal Services & Fast User Switching, File System, Networking, Programmer Interface. **Case Study: The Linux System** : Design Principles, Kernel Modules, Process Management, Scheduling, Memory Management, File System, Input Output, Inter Process Communication, Network Structure, Security.

**Learning Resources:**

- Operating System Concepts - Operating System Concepts, Tenth Edition, Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, John Wiley & Sons Inc.
- Modern Operating Systems- Andrew S Tanenbaum, Prentice Hall
- Operating Systems - Operating System: Internals and Design Principles , William Stallings
- Operating Systems - System Programming and Operating Systemes D M Dhamdhare, Tata Mc Graw Hill
- Operating Systems - Operating Systems: A Modern Perspective, Gary Nutt, Addison Wesley
- Operating Systems - Operating Systems, Achyut S Godbole, Tata Mc Graw Hill
- Design of the Unix Operating System - Maurice Bach, Prentice Hall.
- <https://nptel.ac.in/courses/106108101/>
- <https://www.classcentral.com/course/udacity-introduction-to-operating-systems-3419>

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

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	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 INFORMATION TECHNOLOGY****AUTOMATA, LANGUAGES AND COMPUTATION**

Syllabus for B.E V-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : <b>U20PC540IT</b>
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hrs

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b> <i>On completion of the course, students will be able to</i>
Introduce central concepts in theory of computation and to design grammars and recognizers for different formal languages, and also to determine the decidability and intractability of computational problems.	<ol style="list-style-type: none"> <li>1. Design finite automata, RE's for a given language.</li> <li>2. Define properties of RL's, Design grammars, minimize FA and also apply the concept of pumping lemma to prove that certain languages are not regular.</li> <li>3. Design PDA's for various CFG's and CFL's, simplify the CFG's, define properties of CFL's.</li> <li>4. Define programming techniques of Turing machines and design Turing machines for decidable problems</li> <li>5. Apply mathematical and formal techniques for solving problems in computer science and also define concepts of computability theory, and complexity theory.</li> </ol>

**UNIT I:**

**Finite Automata:** Introduction, Central Concepts of Automata Theory, Deterministic Finite Automata, Nondeterministic Finite Automata, NFA to DFA Conversion, Finite Automata with Epsilon Transitions, Equivalence between NFA with and without Epsilon Transitions.

**Regular Expressions:** Regular Expressions, Identity Rules for Regular Expressions, Algebraic Laws for Regular Expressions, Equivalence between Finite Automata and Regular Expressions, Applications of Finite Automata and Regular Expressions.

**UNIT II:**

**Properties of Regular Languages:** Pumping Lemma for Regular Languages, Closure Properties of Regular Languages, Decision Properties of Regular Languages, Equivalence between two FSM's, Minimization of Finite Automata.

**Grammars and Languages:** Chomsky Hierarchy of Languages, Grammars and Languages Generated, Context-Free Grammars, Derivations, Parse Trees, Ambiguity in Grammars and Languages.

**UNIT III :**

**Pushdown Automata:** Introduction, Formal Definition and Behavior of PDA, Language of PDA, Design of PDA, Equivalence of PDA and CFG's, DPDA.

**Properties of Context Free Languages:** Simplification of CFG's, Normal Forms for CFG's: CNF and GNF, Pumping Lemma for Context Free Languages, Closure Properties of Context Free Languages, Decision Properties of Context Free Languages

**UNIT IV :**

**Turing Machines:** Introduction, Formal Definition and Behavior of TM, Language of a TM, Design of TM's, Programming Techniques for TM's, Extensions to the TM's, Restricted TM's.

**UNIT V :**

**Undecidability:** Recursive and Recursively Enumerable Languages, Properties of Recursive and Recursively Enumerable Languages, The Church-Turing Thesis, A Language that is not Recursively Enumerable, An Undecidable Problem that is RE, PCP and MPCP.

**Learning Resources:**

1. John E.Hopcroft, Rajeev Motwani, Jeffery D Ulman, Introduction to Automata Theory Languages And Computation, Third edition, Pearson Education.
2. Theory of Computer Science- Automata languages and computation –Mishra and Chandrashekar, Third edition, PHI
3. Michael Sipser, Introduction to Theory of Computation, 3rd Edition, Course Technology, 2012.
4. K.Krithivasan and R.Rama; Introduction to Formal Languages, Automata Theory and Computation; Pearson Education, 2009.
5. John C. Martin, Introduction to Languages and The Theory of computation, Third edition, Tata McGraw Hill, 2003.
6. <https://nptel.ac.in/courses/106106049/>
7. <https://nptel.ac.in/courses/106104028/>

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

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	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**



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DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

**COURSE NAME-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: <b>U20HS510EH</b>
Credits : 1	CIE Marks :30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<p><b>The course will enable the learners to:</b></p> <ol style="list-style-type: none"> <li>1. Get students proficient in both receptive and productive skills</li> <li>2. Enable students to build strategies for effective group interaction and help them in developing decisive awareness and personality while maintaining emotional balance.</li> <li>3. To introduce students to an ideal structure for a presentation</li> <li>4. To develop and improve writing and study skills needed for college work.</li> </ol>	<p><b>At the end of the course the learners will be able to: -</b></p> <ol style="list-style-type: none"> <li>1. Participate in group and forum discussions by providing factual information, possible solutions, and examples</li> <li>2. Present a topic by picking up the key points from the arguments placed.</li> <li>3. Read between the lines and write informed opinions.</li> <li>4. Prepare, present, and analyze reports</li> </ol>

**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**

- a. Report writing
- b. Image Writing
- c. Book Reviews
- d. 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	:	20
2	No. of assignments	:	2	Max. Marks	:	5
3	No. of Quizzes	:	2	Max. Marks	:	5
	Duration of Internal Tests	:	90 Minutes			

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**DEPARTMENT OF INFORMATION TECHNOLOGY**

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

L:T:P(Hrs./week): 0:0:2	SEE Marks :50	Course Code:U20PC511IT
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
Understand the use of client/server architecture in application development, use Input/Output API to implement network applications, to develop simple network monitoring services.	<ol style="list-style-type: none"> <li>1. Demonstrate the usage of socket APIs</li> <li>2. Apply the basics of network programming to perform Input/Output operations in the network.</li> <li>3. Use of different protocols and network programming concepts to develop client-server applications.</li> <li>4. Implementation of different services like ping, time and date service</li> </ol>

1. Understanding and using of commands like ifconfig, DNS, netstat, ping, arp, telnet, ftp, finger, traceroute, whois etc.
2. Usage of elementary socket system calls[socket(),bind(),listen(), accept(),connect(),send(), recv(), sendto(), recvfrom()].
3. Implementation of Connection oriented iterative service (TCP).
4. Implementation of Connection oriented concurrent service (TCP).
5. Implementation of Connectionless Iterative service (UDP).
6. Implementation of Connectionless concurrent service (UDP).
7. Implementation of Time service and Date service using RPC.
8. Implementation of Ping service.
9. Implement CRC, bit stuffing, byte stuffing.

**Note: Implement programs in C programming using LINUX platform.**

**Content Beyond Syllabus:**

1. Implementation of HTTP.
2. Implementation of Concurrent chat server( current Logged in users)

**Learning Resources:**

1. W. Richard Stevens, "Unix Network Programming", Prentice Hall, Pearson Education, 2009.
2. Douglas E.Comer, "Hands-on Networking with Internet Technologies", Pearson Education.
3. <https://nptel.ac.in/courses/106105183/25>
4. <http://www.nptelvideos.in/2012/11/computer-networks.html>
5. <https://nptel.ac.in/courses/106105183/3>

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: 2Hours			

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**IBRAHIMBAGH, HYDERABAD – 500 031**  
**DEPARTMENT OF INFORMATION TECHNOLOGY**

**MICROPROCESSORS AND INTERFACING LAB**  
**SYLLABUS FOR B.E. V SEMESTER**

L:T:P(Hrs./week): 0:0:2	SEE Marks :50	Course Code: <b>U20PC521IT</b>
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
The course will enable the students to write assembly language programs using 8085 and 8086 microprocessors.	<ol style="list-style-type: none"> <li>1. Do basic assembly language programming using 8085 microprocessor</li> <li>2. Do basic assembly language programming using 8086 microprocessor.</li> <li>3. Interface various peripherals to 8086 microprocessor.</li> </ol>

1. Assembly Language programming with 8085, 8086 .
2. Interfacing and programming of 8255.
3. Interfacing and programming of 8253/8254.
4. Interfacing and programming of 8279.
5. A/D and D/A converter interface.
6. Stepper motor interface.
7. Display interface

**Note:** Adequate number of programs covering all the instructions of 8085 & 8086 instruction set. Experiments should be done on the 8085, 8086 microprocessor trainer kits and Assembler

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

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

Duration of Internal Test: 2Hours

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

**OPERATING SYSTEMS LAB**  
**SYLLABUS FOR B.E. V SEMESTER**

L:T:P(Hrs./week): 0:0:2	SEE Marks :50	Course Code: <b>U20PC531IT</b>
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

Course Objective:	Course Outcomes:
<b>The course will enable the students to:</b>	<b>At the end of the course student will be able to:</b>
Learn the usage of system calls along with applying the concepts of inter process communication and process synchronization.	<ol style="list-style-type: none"> <li>1. Write programs which interact with the operating system using system calls .</li> <li>2. Write programs to demonstrate inter process communication.</li> <li>3. Write programs to demonstrate process synchronization.</li> <li>4. Write programs for threads creation and manipulation.</li> </ol>

1. Familiarity and usage of system calls of Linux on
  - a) File management (open,close, read, write, open dir, readdir, stat etc)
  - b) Process management (fork, exec ,getpid, wait exit etc)
2. Implement a program to get and set the environment variables using system calls.
3. Implementation of Echo server using pipes.
4. Implementation of Echo server using shared memory.
5. Implementation of Echo server using messages.
6. Implementation of Producer Consumer Problem using semaphores.
7. Implementation of Producer Consumer Problem using message passing.
8. Implementation of Reader-writer problem using semaphores.
9. Implementation of Dining philosophers problem using semaphores.
10. Creating threads and manipulating under Linux platform.

**Learning Resources:**

1. W. Richard Stevens, Unix Network Programming, Prentice Hall/Pearson Education,2009.
2. [http://profile.iiita.ac.in/bibhas.ghoshal/teaching\\_os\\_lab.html](http://profile.iiita.ac.in/bibhas.ghoshal/teaching_os_lab.html)

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

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
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**DEPARTMENT OF INFORMATION TECHNOLOGY**  
**SYLLABUS FOR B.E. V SEMESTER**

**MINI PROJECT-II**

<b>Instruction:</b> 2Hrs /week	<b>SEE Marks :</b> 50	<b>Course Code :</b> U20PW5191T
<b>Credits :</b> 1	<b>CIE Marks :</b> 30	<b>Duration of SEE :</b> 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
1. Promote project-based learning by working on societal problems.  2. Encourage individual and teamwork, communication, life-long learning and follow professional ethics.	1. Review the existing literature/ models to identify the scope for extension.  2. Apply technical knowledge to develop novel solutions for real life problems.  3. Plan and execute projects by following effective software development life cycle.  4. Design and demonstrate the prototypes.  5. Practice professional ethics, teamwork and lifelong learning.

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

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

S.No.	Dept.	Course Code	Name of the Course	Credits
1	Civil	U20OE510CE	Spatial Information Technology	3
2	CSE	U20OE510CS	Introduction to Operating Systems	3
3	CSE	U20OE520CS	Web Design	3
4	ECE	U20OE510EC	Sensors for Engineering Applications	3
5	ECE	U20OE010EC	Mathematical Programming for Engineers	3
6	EEE	U20OE510EE	Solar Power and Applications	3
7	IT	U20OE510IT	Introduction to Database Management Systems	3
8	IT	U20OE520IT	Introduction to Statistical Programming	3
9	Mechanical	U20OE510ME	Introduction to Robotics	3
10		U20OE520ME	Introduction to Automobile Engineering	3
11	Mathematics	U20OE510MA	Numerical Methods (for CSE, AIML & IT)	3
12	H&SS	U20OE610EH	Design Thinking	3
13		U20OE520EH	Technical Writing and Professional Presentations	3
14		U20OE530HS	Basics of Entrepreneurship	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 1. To provide fundamental knowledge on geo spatial technology such as Remote sensing GPS and GIS.	Upon the completion of the course, students are expected to 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:**

- James B. Campbell & Randolph H. Wynne., Introduction to Remote Sensing, The Guilford Press, 2011
- Lillesand, Kiefer, Chipman., Remote Sensing and Image Interpretation, Seventh Edition, 2015
- Leick, A., GPS Satellite Survey, John Wiley: NJ, 2015
- Hofmann, B., Lichtenegger H. and Collins J., Global Positioning System: Theory and Practice, Springer: Berlin, 2011.
- Basudeb Bhatta, Remote Sensing and GIS, Oxford University Press, 2011.
- Hofmann-Wellenhof, Bernhard, Lichtenegger, Herbert, Wasle, Elmar, GNSS – GPS, GLONASS, Galileo and more, 2013
- Thanappan Subash., Geographical Information System, Lambert Academic Publishing, 2011.
- Paul Longley., Geographic Information systems and Science, John Wiley & Sons, 2005
- John E. Harmon & Steven J. Anderson., The design and implementation of Geographic Information Systems, John Wiley & Sons, 2003
- ArcGIS 10.1 Manuals, 2013.
- Kang Tsung Chang., Introduction to Geographic Information Systems, Tata Mc Graw Hill Publishing Company Ltd, New Delhi, 2008.
- Burrough, P.A., Principles of GIS for Land Resource Assessment, Oxford Publications, 2005.
- 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 Computer Science & Engineering

**INTRODUCTION TO OPERATING SYSTEMS (OPEN ELECTIVE-III)**

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

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : <b>U20OE510CS</b>
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
1 Understand different Operating system Structures and Services.	1 Explain Operating system structures and internal structure of a process
	2 Compare CPU scheduling algorithms. Analyze Disk scheduling algorithms
	3 Apply different techniques for Main memory management.
	4 Describe file management techniques.
	5 Describe deadlock handling methods.

**UNIT-I:**

**Introduction to operating systems:** Definition, User view and System view of the Operating system, Operating system structure, Operating system services.

**Process:** Process concept, Process Control block, Context switching.

**UNIT-II:**

**CPU Scheduling:** Scheduling Criteria, Scheduling Algorithms: FCFS, SJF, Round Robin

**Device Management:** Disk Scheduling algorithms: FCFS, SSTF, SCAN.

**UNIT –III:**

**Memory Management:** Swapping, Contiguous memory allocation: Fixed Partitioning, Variable Partitioning. Non-Contiguous memory allocation: Paging.

**Virtual memory:** Demand paging, Page replacement Algorithms: FIFO, Optimal, LRU.

**UNIT –IV:**

**File System Interface:** File Concept, Access Methods: Sequential, Indexed, and Direct

**File System Implementation:** File-System Structure, Allocation Methods: Contiguous, Linked and Indexed.

**UNIT-V:**

**Deadlocks:** System model, deadlock characterization: Mutual Exclusion, Hold and Wait, Non pre-emption, Circular wait. Deadlock Prevention, Deadlock Avoidance: Banker's algorithm.

**Learning Resources:**

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

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

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

Duration of Internal Tests: 90 Minutes

**VASAVI COLLEGE OF ENGINEERING(Autonomous)**

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science &amp; Engineering

**WEB DESIGN (OPEN ELECTIVE-III)**

SYLLABUS FOR B.E. V-SEMESTER

(COMMON FOR CIVIL, ECE, EEE &amp; MECH)

L:T:P (Hrs./week): 3:0:0	SEE Marks: 60	Course Code : <b>U20OE520CS</b>
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 application using HTML, CSS, JavaScript and PHP.	1	Design static web pages.
		2	Apply styles to the web pages.
		3	Create dynamic web pages using JavaScript.
		4	Design DTD and schema for a given XML file.
		5	Develop server side components using PHP.

**UNIT-I:** Web Basics and overview: Introduction to Internet, World Wide Web, Web Browsers, Web Servers, URL, MIME, HTTP, Web Programmers Tool Box, Introduction to HTML Purpose of HTML and XHTML, Text Formatting, Hypertext Links, Images, Lists, Tables, Forms and Frames.

**UNIT-II:** Cascading Style Sheets- Levels of Stylesheet, Style Specification Formats, Selector Formats, Property Value Forms, Font Properties, List Properties, Alignment of Text, Box Model, Background Images, Borders, div and span tags, Conflict Resolution.

**UNIT-III:** JavaScript - Object Orientation and JavaScript, Primitives, Operations, Expressions, Control Statements, Object Creation, Arrays, Functions- Introduction, Program Modules in JavaScript, Programmer-Defined Functions, Function Definitions, Random-Number Generation, Scope Rules, JavaScript Global Functions, Recursion, Constructors, Regular Expressions, DOM Model, Events, Event Handling in JavaScript, JavaScript objects.

**UNIT-IV:** Introduction to XML, Syntax of XML, XML Document Structure, Document type Definition, Namespaces and Schemas.

Client-Server Architecture, Multi-tier Architecture, Web server.

**UNIT-V:** PHP- Overview of PHP, General Syntactic Characteristics, Primitives, Operations, and Expressions, Output, Control Statements, Arrays, Functions, Pattern Matching, Form Handling, Cookies and Session Tracking.

**Learning Resources:**

1. Robert W. Sebesta, "Programming the World Wide Web", Pearson Education.(4<sup>th</sup> Edition)
2. Uttam K.Roy, "Web Technologies", Oxford publishers.
3. <http://www.w3schools.com>
4. <https://www.php.net/manual/en/tutorial.php>

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

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

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

ACCREDITED BY NAAC WITH 'A++' GRADE

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: <b>U20OE510EC</b>
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.

**CO-PO-PSO Mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1					1							2	
CO2	2	2		2			1							2	
CO3	1	1	1	2			1							2	
CO4	1	2	2											2	

**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, potentiometric 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 counter (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.
- Jacob 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	:	<input type="text" value="2"/>	Max. Marks for each Internal Tests	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Tests: 90 Minutes

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**Mathematical Programming for Engineers (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: <b>U20OE010EC</b>
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To provide fundamental knowledge of programming language for solving problems.	On completion of the course, students will be able to 1. Generate arrays and matrices for numerical problems solving. 2. Represent data and solution in graphical display. 3. Write scripts and functions to easily execute series of tasks in problem solving. 4. Use arrays, matrices and functions in Engineering applications 5. Design GUI for basic mathematical applications.

**CO-PO-PSO Mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	3	-	-	-	-	-	-	-	-	2	3
CO2	-	2	-	-	3	-	-	-	-	-	-	-	-	2	3
CO3	1	1	2	2	3	-	-	-	-	-	-	-	-	2	3
CO4	1	2	-	-	3	-	-	-	-	-	-	-	-	2	3
CO5	-	1	1	1	3	-	-	-	-	-	-	-	-	2	3

**UNIT - I : Introduction:**

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

**MATLAB Basics:** Variables and Constants – Vectors and Matrices- Arrays - manipulation- Built-in MATLAB Functions. Creating and printing simple plots, Creating, Saving and Executing a Script File, Creating and Executing a function file.**Programming Basics:** Data types-Operators – Hierarchy of operations, Relational and logical operators, if-end structure, if-else-end structure, if-elseif-else-end structure, switch-case statement, for-end loop, while-end loop, break and continue commands.**UNIT - II : Scripts and Functions**

Script Files, Function Files, Debugging methods in MATLAB.

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

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

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

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

**UNIT - V :****Solution of Ordinary differential Equations(ODEs)-**The 4<sup>th</sup> order Runge-kutta Method, ODE Solvers in MATLAB, Solving First –order equations using ODE23 and ODE45.**Structures and Graphical user interface using app Designer:** Advanced data Objects, How a GUI works, Creating and displaying a GUI. GUI components, Dialog Boxes.**Learning Resources:**

- Getting started with MATLAB "A quick introduction for scientist and engineers by Rudra Pratap, Oxford publications.
- Advanced Guide to MATLAB-Practical Examples in Science and Engineering by S.N.Alam, S.Islam, S.K. Patel-I.K. International Publishing House Pvt. Ltd.
- Stephen J. Chapman-"MATLAB Programming for Engineers"- 5th Edition- Cengage Learning- 2015. Getting started with MATLAB (Version 9) The Math works.
- An Introduction to MATLAB® Programming and Numerical Methods for Engineers 1st Edition by Timmy Siau Alexandre Bayen, Elsevier-18th April 2014.
- <https://nptel.ac.in/courses/103106118/2>
- <https://www.udemy.com/numerical-methods/>

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

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

Duration of Internal Tests: 90 Minutes

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

DEPARTMENT OF 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:U200E510EE
Credits:3	CIE Marks: 40	Duration of SEE: 3Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: To impart the basics of solar energy harnessing and solar panel and array.	On completion of the course, students will be able to 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, 2<sup>nd</sup> Edition, Tata McGraw Hill.
2. G. D. Rai, Non-Conventional Energy Sources, 13<sup>th</sup> Reprint 2014, Khanna Publications.

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

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

Duration of Internal Tests: 90 Minutes

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

## Introduction to Database Management Systems

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

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code :U20OE510IT
Credits :3	CIE Marks: 40	Duration of SEE :3 Hours

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

### UNIT – I

**Introduction:** Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Architecture, Database Users and Administrators.

**Database Design and the E-R Model:** Overview of the Design Process, The E-R Model, Constraints, E-R Diagrams

### UNIT – II

**Relational Model:** Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Fundamental Relational-Algebra Operations.

### UNIT – III

**Structured Query Language:** Introduction, Data Definition, Basic Structure of SQL Queries, Modification of the Database, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Subqueries, Join Expressions, Views.

### UNIT – IV

**Relational Database Design:** Features of Good Relational Design, Normalization-Decomposition Using Functional Dependencies, Functional-Dependency Theory.

### UNIT – V

**Transactions:** Transaction Concepts, Transaction State, Concurrent Executions, Serializability

**Concurrency Control:** Lock-Based Protocols, Timestamp-Based Protocols.

### Learning Resources :

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

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

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



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

## Introduction to Statistical Programming

(Open Elective-III) SYLLABUS OF B.E V- SEMESTER

(Common for CIVIL, ECE, EEE & MECH)

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code : <b>U200E520IT</b>
Credits :3	CIE Marks: 40	Duration of SEE :3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to apply the statistical programming concepts and techniques using Python libraries in the analysis of Statistical data.	On completion of the course, students will be able to <ol style="list-style-type: none"> <li>1. Understands the basics of statistical concepts and various data types in Numpy, Pandas.</li> <li>2. Cleans and Analyzes the data with descriptive statistics and EDA.</li> <li>3. Visualizes the data with matplotlib, seaborn graphic libraries.</li> <li>4. Analyzes data with various statistical inference techniques using Hypothesis testing.</li> <li>5. Understands and applies various data distributions, sampling and simulation of random variables.</li> <li>6. Applies various statistical models like linear regression, ANOVA to the data.</li> </ol>

### Unit I: Introduction to Statistical computing and Python libraries

Intro to statistics: Samples and Population, Descriptive statistics; intro to Computational statistics, Data analysis, knowledge discovery in Data, Various data types.

Intro to statistical computing software: Python libraries & R.

### Unit II: Data Collection, Cleaning and Exploratory Data Analysis using Pandas.

Data types in Numpy, Pandas: list, vector, matrix, array, tensor, DataFrame. Operations on Data Types.

Data import using Pandas, Data cleaning, imputation, EDA case studies using Pandas.

### Unit III: Data Visualization with matplotlib and Seaborn.

Intro to matplotlib and Seaborn graphic libraries, basic visualizations using matplotlib, Advanced visualizations with Seaborn, Data correlation chart. Case studies on visualizations.

### Unit IV: Data distributions, Statistical Inference using Hypothesis testing.

Understanding various data distributions: Bernoulli, Binomial, Exponential, Poisson & Gaussian.

Intro to Hypothesis testing: p-value, critical value, interpretation of test results.

Types of Hypothesis testing using Scipy.stats: Normality tests, Correlation tests, Comparing samples.

### Unit V: Simulations and Statistical models

Random variables, sampling and simulation of data distributions.

Statistical models: Linear algebra, Optimizations, Linear regression, Intro to Statistical or Machine learning.

### Learning Resources:

1. [https://machinelearningmastery.com/statistics\\_for\\_machine\\_learning/](https://machinelearningmastery.com/statistics_for_machine_learning/)
2. <https://scipy-lectures.org/packages/statistics/index.html>
3. Udemy: Python for Statistical Analysis
4. courseera: Statistics with Python specialization
5. <https://numpy.org/>
6. <https://pandas.pydata.org/>
7. <https://matplotlib.org/>
8. <https://seaborn.pydata.org/>
9. <https://www.statsmodels.org/stable/index.html>
10. <https://scikit-learn.org/stable/>
11. A first Course in Statistical Programming with R, W. John Braun, Duncan J. Murdoch, Cambridge University Press, 2007.
12. <https://cran.r-project.org/manuals.htm>

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

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



## VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MECHANICAL ENGINEERING

**INTRODUCTION TO ROBOTICS****(Open Elective-III) SYLLABUS FOR B.E. V-SEMESTER**

L:T:P(Hrs./week):3	SEE Marks : 60	Course Code: <b>U200E510ME</b>
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 &amp;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 trajectories 2D 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 Hill Publishing 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
<p>The objectives of this course are to:</p> <ol style="list-style-type: none"> <li>familiarize the student with the different types of automobiles and engine components along with its working.</li> <li>impart adequate knowledge in fuel supply, cooling, lubrication and ignition of IC engines.</li> <li>understand the steering geometry, steering mechanism and types of suspension systems.</li> <li>gain the knowledge about working of clutch, gear mechanism, brakes</li> <li>make the student conversant with types of wheels, tyres and pollution control techniques.</li> </ol>	<p>On completion of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>identify types of Automobiles and engine components and describe its working.</li> <li>describe the engine fuel system in petrol and Diesel engines, cooling, lubrication systems.</li> <li>describe the steering mechanism, suspension systems</li> <li>describe the working principle and operation of clutch, gear mechanism and brakes.</li> <li>know the pollutants from automobile and pollution control techniques and identify the types of wheels, tyres.</li> </ol>

### 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:

- Crouse & Anglin, "Automobile Engineering", 10<sup>th</sup> Edition, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2007.
- Kirpal Singh, "Automobile Engineering", Vol.I& II, 13<sup>th</sup> Edition, Standard Publishers, New Delhi 2013.
- R.B Gupta, "Automobile Engineering" 7<sup>th</sup> Edition, Satya Prakashan, New Delhi, 2015.
- Joseph Heitner, "Automotive Mechanics", 2<sup>nd</sup> Edition, Affiliated East West Pvt. Ltd., 2013.
- C.P. Nakra, "Basic Automobile Engineering", 7<sup>th</sup> 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)**

Accredited by NAAC with A++ Grade

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF MATHEMATICS****NUMERICAL METHODS (Open Elective)****For B.E., V - Semester – CBCS (for CSE & IT only)**

Instruction : 3 Hours per week	Sem. End Exam Marks : 60	Subject Reference Code : U200E510MA
Credits : 3	Sessional Marks: 40	Duration of Semester End Exam : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
<i>The course will enable the students to:</i>	<i>At the end of the course students will be able to:</i>
<ol style="list-style-type: none"> <li><b>Study</b> various numerical methods to solve Algebraic and Transcendental equations.</li> <li><b>Understand</b> the methods to solve linear system of equations.</li> <li><b>Understand</b> the numerical methods in interpolation and extrapolation.</li> <li><b>Understand</b> the numerical methods in interpolation using central differences.</li> <li><b>Understand</b> numerical methods in solving ordinary differential equations.</li> </ol>	<ol style="list-style-type: none"> <li><b>Apply</b> numerical methods to solve Algebraic and Transcendental equations which cannot be solved by traditional algebraic methods</li> <li><b>Solve</b> linear system of equations using direct and iteration methods.</li> <li><b>Use</b> various numerical methods in interpolation and extrapolation.</li> <li><b>Use</b> various numerical methods in interpolation using central differences.</li> <li><b>Find</b> numerical solutions of ordinary differential equations.</li> </ol>

**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-Stirling'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 of 4th order (without proofs).

**Text Books:**

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

**Reference Books:**

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

**Online Resources :**

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

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

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

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

DEPARTMENT OF MECHANICAL ENGINEERING  
SYLLABUS FOR B.E V Semester

### Basics of Entrepreneurship (Open Elective-III)

(Open Elective) SYLLABUS FOR B.E. 3/4 – V SEMESTER

Instruction: 3 Hours	SEE: 60	Course code: U19OE530HS
Credits: 3	CIE: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<p>The objectives of this course are to:</p> <ol style="list-style-type: none"> <li>1. Deeply understand and discover Entrepreneurship</li> <li>2. Build a strong foundation for the students to start, build, and grow a viable and sustainable venture</li> <li>3. Develop an entrepreneurial mind-set equipped with the critical skills and knowledge required.</li> </ol>	<p>On completion of the course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Take-up entrepreneurship as a career choice</li> <li>2. Create and Validate business models. Build a Minimum Viable Product (MVP).</li> <li>3. Identify various costs and revenue streams for a venture.</li> <li>4. Build successful teams and acquire sales skills.</li> <li>5. Understand the business regulations and various Government schemes available.</li> </ol>

#### UNIT-I

**Introduction to Entrepreneurship:** Definition of Entrepreneurship, Entrepreneurship as a career choice, Benefits and Myths of Entrepreneurship; Characteristics. Qualities and Skills of an Entrepreneur. Impact of entrepreneurship on the Economy and Society.

**Opportunity and Customer Analysis:** Identify your Entrepreneurial Style, Identify Business Opportunities, Methods of finding and understanding Customer Problems, Process of Design Thinking, Identify Potential Problems, Customer Segmentation and Targeting, Customer Adoption Process, Crafting your Value Propositions, Customer-Driven Innovation.

#### UNIT-II

**Business Model and its Validation:** Types of Business Models, Lean Approach, the problem-Solution Test/ Solution Interview Method, Difference between Start-up Venture and small Business, Industry Analysis, Identify Minimum Viable Product (MVP), Build-Measure-Learn Feedback Loop, Product-market fit test.

#### UNIT-III

**Economics and Financial Analysis:** Revenue streams and pricing, Income analysis and Cost Analysis-Product Cost and Operation Cost, Basics of Unit Costing, Profit Analysis, Customer Value Analysis, Different Pricing Strategies, Investors' Expectations, Pitching to Investors and Corporate.

#### UNIT-IV

**Team Building and Project Management:** Leadership Styles, Team Building in Venture, Role of good team in Venture, Roles and Responsibilities, Explore Collaboration Tools and Techniques brain storming, Mind Mapping. Importance of Project Management, Time Management, Work Flow, Network Analysis Techniques,

#### UNIT-V

**Marketing & Business Regulations:** Positioning, Positioning Strategies, Building Digital Presence and Leveraging social Media, Measuring effectiveness of channels, customer Decision-making process, sales plans and targets, unique sales Proposition (usP), Follow-up and close sales. Business Regulations of starting and operating a Business, Start-up Ecosystem, Government schemes.

Learning Resources:

1. Robert D. Hisrich, Michael P Peters, "Entrepreneurship", Sixth edition, Mcgraw-Hill Education.
2. Thomas W. Zimmerer, Norman M. Scarborough, "Essentials of Entrepreneurship and small business Management", Fourth edition, Pearson, New Delhi, 2006.
3. Alfred E. Osborne, "Entrepreneurs Toolkit", Harvard Business Essentials, HBS press, USA, 2005
4. MadhurimaLall and ShikhaSahai, "Entrepreneurship", Excel Books, First Edition, New Delhi, 2006

Web Resource: <http://www.learnwise.org>

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

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2	No. of assignments	:	<input type="text" value="3"/>	Max. Marks	:	<input type="text" value="5"/>
3	No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks	:	<input type="text" value="5"/>

Duration of Internal Tests : 90 Minutes

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

**DESIGN THINKING**

(Open Elective) SYLLABUS FOR B.E. 3/4 – V SEMESTER

Instruction: 3 Hours	SEE: 60	Course code: U20OE610EH
Credits: 3	CIE: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<p>The course will enable the learners to:</p> <ol style="list-style-type: none"> <li>1. Understand the critical design thinking skills needed to either improve an existing product or thinking design a new product.</li> <li>2. Learn to identify customer needs and draft customer needs statements as your first step toward user innovations.</li> <li>3. Learn how to translate user needs into product specifications quantitatively, and how establishing product metrics can help to define those specifications.</li> <li>4. Learn to apply creativity, brainstorming, and concept generation process in designing needs solutions.</li> <li>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.</li> </ol>	<p>At the end of the course the learners will be able to: -</p> <ol style="list-style-type: none"> <li>1. Learn the concepts that drive design thinking.</li> <li>2. Submit project ideas around user Innovations.</li> <li>3. Identify prospective customer needs and user groups.</li> <li>4. Translate needs into product specifications</li> <li>5. Build out the product architecture, Create a prototype and present the prototype.</li> </ol>

### 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

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

### ASSESSMENTS

- 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	:	<input type="text" value="2"/>	Max. Marks	:	<input type="text" value="30"/>
2	No. of assignments	:	<input type="text" value="3"/>	Max. Marks	:	<input type="text" value="5"/>
3	No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks	:	<input type="text" value="5"/>

Duration of Internal Tests : 90 Minutes

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

## Technical Writing and Professional Presentations

(Open Elective) SYLLABUS FOR B.E. 3/4 – V SEMESTER

Instruction: 3 Hours	SEE: 60	Course code: U200E520EH
Credits : 3	CIE: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<p>The course will enable the learners to:</p> <ol style="list-style-type: none"> <li>1. Understand the principles and mechanics of technical writing for students of engineering.</li> <li>2. Identify different kinds of business correspondences and the dos and don'ts for each of them.</li> <li>3. Make effective presentations as part of today's workplace demands.</li> <li>4. Recognize the need for Video and Written CVs with focus on specific elements.</li> <li>5. Comprehend skills associated with technical writing and understand different papers ranging from process description and feasibility reports to research projects, project proposals, and SOPs</li> </ol>	<p>At the end of the course the learners will be able to: -</p> <ol style="list-style-type: none"> <li>1. Write effective reports.</li> <li>2. Articulate business correspondences based on need.</li> <li>3. Make persuasive presentations.</li> <li>4. Design their videos CVs.</li> <li>5. Write papers ranging from process description and feasibility reports to research projects, project proposals, and statement of purpose</li> </ol>

### UNIT 1: FORMAL & INFORMAL TECHNICAL REPORTS

- 1.1 Informal Report Formats
- 1.2 Project and Research Reports
- 1.3 Formal Report Components, Feasibility Reports, Evaluation reports
- 1.4 Analytical and Informational reports
- 1.5 Executive summaries.

### UNIT 2: BUSINESS CORRESPONDENCE

- 2.1 Electronic communication
- 2.2 Effective emails
- 2.3 Instant and text messaging guidelines

### UNIT 3: PROFESSIONAL PRESENTATIONS

- 3.1 Paper presentations & Poster presentations
- 3.2 PowerPoint presentations
- 3.3 Storyboard writing

### UNIT 4: RESUME & CVs

- 4.1 Technical Resume
- 4.2 Cover letter, resume format
- 4.3 Video CVs

### UNIT 5: WRITING PROPOSALS & SOPs

- 5.1 Types of proposals
- 5.2 Request for proposals
- 5.3 Stating your objective.

### METHODOLOGY

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

### ASSESSMENTS

- Online assignments
- Individual and Group

### LEARNING RESOURCES

learn.talentsprint.com

4. Read Me First!: A Style Guide for the Computer Industry by Sun Technical Publications.



5. Eats, Shoots and Leaves Paperback – 18 February 2010 by Lynne Truss.
6. Don't Make Me Think, Revisited: A Common Sense Approach to Web & Mobile Usability | Third Edition | By Pearson Paperback.
7. 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	:	<input type="text" value="2"/>	Max. Marks	:	<input type="text" value="30"/>
2	No. of assignments	:	<input type="text" value="3"/>	Max. Marks	:	<input type="text" value="5"/>
3	No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks	:	<input type="text" value="5"/>

Duration of Internal Tests : 90 Minutes

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**SCHEME OF INSTRUCTION AND EXAMINATION (R-20)**  
**B.E. – INFORMATION TECHNOLOGY : SIXTH SEMESTER (2022 - 2023)**

<b>B.E (IT) VI-SEMESTER</b>								
<b>Course Code</b>	<b>Course Name</b>	<b>Scheme of Instruction</b>			<b>Scheme of Examination</b>			<b>Credits</b>
		<b>Hours per week</b>			<b>Duration in Hrs</b>	<b>Maximum Marks</b>		
		<b>L</b>	<b>T</b>	<b>P/D</b>		<b>SEE</b>	<b>CIE</b>	
U20PC610IT	Artificial Intelligence and Machine Learning	3	-	-	3	60	40	3
U20PC620IT	Embedded Systems and IoT	3	-	-	3	60	40	3
U20PC630IT	Web Technologies	3	-	-	3	60	40	3
U20OE6XXXX	Open Elective - IV	3	-	-	3	60	40	3
U20HS040EH	Economics and Finance for Engineers	2	-	-	3	60	40	2
U20HS020EH	Human Values & Professional Ethics – II	1	-	-	2	40	30	1
U20BS610MA	Skill Development Course – VII : Verbal Aptitude	1	-	-	2	40	30	1
U20XX610XX	Skill Development Course – VIII : Technical Skills – III	1	-	-	2	40	30	1
<b>PRACTICALS</b>								
U20PC611IT	Artificial Intelligence and Machine Learning Lab	-	-	2	3	50	30	1
U20PC621IT	Embedded Systems and IoT Lab	-	-	2	3	50	30	1
U20PC631IT	Web Technologies Lab	-	-	2	3	50	30	1
U20PW619IT	Theme Based Project	-	-	2	3	50	30	1
CCA- IV : Technical Skills		-	-	-	-	-	-	-
Library / Sports / Mentor Interaction		-	-	-	-	-	-	-
Student should acquire one online certification course equivalent to 2 credits during III-VII Semesters.								
<b>Total</b>		<b>17</b>	<b>-</b>	<b>8</b>	<b>-</b>	<b>620</b>	<b>410</b>	<b>21</b>
<b>Grand Total</b>		<b>25</b>			<b>-</b>	<b>1030</b>		<b>21</b>

**Note:**

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

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

**ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**  
**SYLLABUS FOR B.E VI- SEMESTER**

L:T:P (Hrs./week):: 3:0:0	SEE Marks : 60	Course Code : <b>U20PC610IT</b>
Credits : 3	CIE Marks: 40	Duration of SEE : 3 Hrs

Course Objectives	Course Outcomes
The Objectives of the course:	At the end of the course student will be able to:
<ol style="list-style-type: none"> <li>1. Introduce the fundamental concepts of logic programming, searching strategies in Artificial Intelligence.</li> <li>2. Discuss supervised and unsupervised Machine Learning algorithms and evaluation metrics to validate the performance.</li> <li>3. Introduce the basics of deep learning and reinforcement learning.</li> </ol>	<ol style="list-style-type: none"> <li>1. Apply appropriate search strategies for solving a given search problem.</li> <li>2. Apply logic concepts to prove inferences from the given premises.</li> <li>3. Apply appropriate parametric, non-parametric ML algorithm and ensemble learning for a given classification problem and validate.</li> <li>4. Understand the fundamentals of deep learning and reinforcement learning and develop a multi-layer neural network to solve a classification problem.</li> <li>5. Identify clusters from unlabelled data and validate.</li> </ol>

**UNIT-I:**

**Introduction to AI:** Introduction, Intelligent Systems, Foundations of AI, Sub Areas of AI, Applications.

**Problem solving - State-Space Search and Control Strategies:** Introduction, General Problem Solving, Characteristics of Problem, Exhaustive Searches, Heuristic Search Techniques, Iterative-Deepening A\*.

**UNIT-II:**

**Logic Concepts and Logic Programming:** Introduction, Propositional Calculus, Propositional Logic, Natural Deduction System, Axiomatic System, Semantic Tableau System in Propositional Logic, Resolution Refutation in Propositional Logic, Predicate Logic, Logic Programming.

**Introduction to Machine Learning:** Types of Learning: Supervised Learning, Unsupervised Learning, Reinforcement Learning, Applications of ML.

**Supervised Learning:** Linear Regression, Logistic Regression, Bias-Variance Trade-Off.

**UNIT-III:**

**Supervised-Nonparametric Learning:** Introduction to Decision Trees, The Basic Decision Tree Learning Algorithm-ID3, Overfitting in Decision Trees, k-Nearest Neighbor Learning, Feature Selection, Feature Extraction, Collaborative Filtering.

**Supervised-Parametric Learning:** Support Vector Machine, The Dual Formulation, Nonlinear SVM and Kernel Functions.

**UNIT-IV:**

**Artificial Neural Networks:** Introduction, The Perceptron, Learning Boolean Functions, Multilayer Perceptrons, Backpropagation.

**Supervised-Parametric Bayesian Learning:** Probability Basics and Bayes Theorem, MAP, Maximum likelihood, Naive Bayes Classifier, Bayesian Belief Networks.

**UNIT-V:**

**Ensemble Learning:** Bagging, Boosting-Ada Boost, Random Forests.

**Unsupervised Learning:** Clustering, k-Means Clustering, Density-based Clustering-DBSCAN, Hierarchical Clustering.

**Reinforcement Learning:** Introduction, The Learning Task, Q Learning.

**Learning Resources:**

1. Saroj Kaushik, Artificial Intelligence, Cengage Learning, 2011.
2. Russell, Norvig, Artificial intelligence, A Modern Approach, Pearson Education, Second Edition, 2004
3. Tom Mitchell, Machine Learning , First Edition, McGraw-Hill, 1997
4. Christopher Bishop. Pattern Recognition and Machine Learning. Second Edition.
5. Ethem Alpaydin , Introduction to Machine Learning, Second Edition
6. T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning, 2e, 2008.

7. <http://nptel.ac.in/courses/106106139/>
8. <https://nptel.ac.in/courses/106/105/106105152/>

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

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	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**

30
05
05

**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
**IBRAHIMBAGH, HYDERABAD – 500 031**  
**DEPARTMENT OF INFORMATION TECHNOLOGY**  
**SYLLABUS FOR B.E VI- SEMESTER**

**EMBEDDED SYSTEMS and IOT**

L:T:P (Hrs./week):: 3:0:0	SEE Marks : 60	Course Code : <b>U20PC620IT</b>
Credits : 3	CIE Marks: 40	Duration of SEE : 3 Hrs

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
	<i>On completion of the course, students will be able to</i>
The course will enable the students to	
1. Explore theoretic aspects of the design and development of an embedded system	1. Apply the architectural features of 8051 microcontroller in writing assembly language and Embedded C programs and explain various concepts related to Real Time systems
2. Familiarize in programming and interfacing concepts related to 8051 and advanced processors.	2. Design interfacing circuits for various peripherals with 8051 and understand the architecture features of ARM and write simple programs using it.
3. Develop IoT infrastructure for different applications and understand the concepts of Real time systems	3. Understand the architectural overview of IoT
	4. Develop IoT based real time applications
	5. Understand architectural features of SOC's and Develop Embedded system applications with SOC's

**UNIT – I:**

Introduction, Complex Systems and Microprocessor, Embedded System Design Process

Introduction to Real Time systems, Timing constraints, Real Time Task Scheduling, Classification of Real Time scheduling: clock driven, simple priority based, Features of Real time operating system, Case study: VxWorks.

8051 Architecture, signal functions, Instruction set, assembly language programming, Input/output Ports and Circuits, I/O port programming, External Memory interfacing, Counter and Timers: modes of operation, timer programming, Serial communication programming, Interrupts and interrupt programming.

**UNIT – II:**

Interfacing with 8051, keyboards, LEDs, LCDs, ADC, DAC, stepper motor.

ARM architecture - ARM organization and implementation - The ARM instruction set - The thumb instruction set - Basic ARM Assembly language program - ARM CPU cores.

**UNIT – III:**

Introduction to Internet of Things- Definition & Characteristics of IoT, Sensors and Actuators, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies, Wireless sensor Networks and its technologies, IoT Levels & Deployment Templates, Domain specific IoT's

**UNIT – IV:**

IoT Design Methodology, Case study on IoT system, Basic building blocks of an IoT device, Bus protocols I2C, CAN, SPI, Raspberry Pi board, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry Pi with Python, IoT Physical Devices and Endpoints Arduino UNO, Introduction to M2M, Differences between IoT and M2M, IoT platforms

**UNIT – V:**

IoT System On Chip, Embedded platforms for IoT: Zynq SOC Architecture, RF SOC architecture, Xilinx Vivado Design Flow, PYNQ open source platform for IoT embedded systems

**Learning Resources:**

- Wayne Wolf, "Computers and Components", Elsevier.
- KennethJ.Ayala, "The8051 Microcontroller", Third Edition, Thomson.
- Muhammad Ali Mazidi, Janice Gillespie Mazidi, Rolin D. Mc Kinlay, The 8051 Microcontroller and Embedded Systems using Assembly and C, Second Edition, Pearson.
- David E. Simon, "An Embedded Software Primer", Pearson Education
- Raj Kamal, "Embedded Systems", Tata McGraw Hill.
- FrankVahid, TonyGivargis, John Wiley, "Embedded System Design", Wiley Student Edition.
- W.A. Smith, "ARM Microcontroller Interfacing: Hardware and Software, Eketor, 2010.
- NPTTEL Online Course on Microprocessors and Microcontrollers, Santanu Chattopadhyay.

9. Arshdeep Bahga, Vijay Madiseti, "Internet of Things: A Hands-on Approach", Universities Press.
10. Sirinivas K.G, Siddesh G.M , "Internet of Things" ,2017 Cengage Learning India Pvt Ltd.
11. Rajib Mall, "Real-Time Systems: Theory and Practice," Pearson, 2008.
12. Jane W. Liu, "Real-Time Systems" Pearson Education, 2001.
13. Krishna and Shin, "Real-Time Systems," Tata McGraw Hill. 1999.
14. <http://www.pynq.io/>
15. <https://www.xilinx.com/products/silicon-devices/soc/zynq-7000.html>
16. [http://www.ioe.nchu.edu.tw/Pic/CourseItem/4468\\_20\\_Zynq\\_Architecture.pdf](http://www.ioe.nchu.edu.tw/Pic/CourseItem/4468_20_Zynq_Architecture.pdf)
17. <https://www.rfwireless-world.com/ApplicationNotes/IoT-System-On-Chip.html>
18. <https://www.aldec.com/en/company/blog/185--enabling-tysom-zynq-based-embedded-development-board-for-aws-iot-greenrass>

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

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	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 INFORMATION TECHNOLOGY**

**WEB TECHNOLOGIES**  
**SYLLABUS FOR B.E VI- SEMESTER**

L:T:P (Hrs./week):: 3:0:0	SEE Marks : 60	Course Code: <b>U20PC630IT</b>
Credits : 3	CIE Marks: 40	Duration of SEE : 3 Hrs

Course Objectives	Course Outcomes
<b>The course will enable the students to:</b>	<b>At the end of the course student will be able to:</b>
<ul style="list-style-type: none"> <li>• Acquire basic skills for designing static and dynamic Web Applications using HTML, CSS, Java script &amp; frame works like Bootstrap.</li> <li>• Learn how to design and develop web applications using Microsoft .NET Technology, Node JS, React and Mongo DB.</li> </ul>	<ol style="list-style-type: none"> <li>1. Design static web pages using HTML and CSS.</li> <li>2. Use JavaScript for creating dynamic web pages and client-side validations.</li> <li>3. Develop responsive web applications using Bootstrap and ASP.NET controls</li> <li>4. Build single page cross-platform applications using React.</li> <li>5. Develop web applications using frameworks and environments like Node.js and MongoDB</li> </ol>

**UNIT-I:**

**Introduction:** World Wide Web, Web Browsers, Web Servers, URL, HTTP, TCP Port.

HTML & CSS: Standard HTML document structure, Basic Tags, Images, Hypertext Links, Lists, Tables, Frames. Introduction to Cascading style sheets.

**UNIT-II**

**JavaScript:** Introduction, Basics of JavaScript-variables, data types and operators, Control Structures, Arrays, Functions, HTML Forms, Events and event handling, Asynchronous JavaScript

**XML :** XML: The Syntax of XML, XML Document Structure, Document Type Definitions.

**UNIT-III**

**Bootstrap:** The Grid system, Layout components: Tables, Images, alerts, buttons, badges, progress bars, cards, drop downs, pagination, Collapse, Navbar, carousel.

**.Net Framework and ASP.NET:**

.Net Framework Overview- Architecture, .Net Framework class Libraries, Introduction to Visual Studio. ASP.NET Benefits, ASP.NET Page Layout, Life Cycle, ASP.NET MVC Controllers, building an application using web form elements. Deploying an ASP.NET Core Application

**UNIT-IV****React**

Introduction to React, Add React to a website, create a new React App, Introducing JSX, Rendering Elements, Components and Props, State and Lifecycle, Handling Events, Conditional Rendering, Lists and Keys, Forms. Building Single-Page applications with React.

**UNIT-V****Application using Node JS and MongoDB:**

Introduction to Node.js-Installing Node.js- Using Events, Listeners, Timers, and Callbacks in Node.js, Introduction to Mongo DB - Accessing MongoDB from Node.js

**Learning Resources:**

1. Robert W. Sebesta, Programming the World Wide Web, 7th Edition (2014), Pearson Education.
2. "Web Technologies", 7th Edition, Uttam K.Roy,2012.
3. Paul J. Deitel, Harvey M. Deitel, Abbey Deitel, Internet & World Wide Web How to Program, 5th Edition, Pearson Education.
4. Dino Esposito, Programming ASP.NET Core (Developer Reference),2018
5. Learning React Functional Web Development with React and Redux by Alex Banks, Eve Porcello, Alex Banks, Eve Porcello
6. Brad Dayley, Brendan Dayley and Caleb Dayley, Node.js, MongoDB and Angular Web Development The definitive guide to using the MEAN stack to build web applications, 2nd Edition, Pearson Education, 2018
7. <http://getbootstrap.com/>
8. <https://reactjs.org/>
9. <https://nodejs.org/en/>



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

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	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**

30
05
05

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

**ECONOMICS AND FINANCE FOR ENGINEERS**

L:T:P (Hrs./week):: 2:0:0	SEE Marks: 60	Course Code: <b>U20HS040EH</b>
Credits: 2	CIE Marks:40	SEE: 3 hrs.

<b>COURSE OBJECTIVES</b>	<u><b>Course Outcomes</b></u>
<p>The objective of the Course is to equip the prospective engineers with the concepts and tools of economics, finance, cost and taxes that facilitate decisions at the work place.</p>	<ol style="list-style-type: none"> <li>1. Enable students to identify the essential components of demand and supply to decide upon the production quantities.</li> <li>2. Facilitate in deciding an appropriate price through the identification of the areas of cost control.</li> <li>3. Make better investment decisions both in short and long run by understanding the financial viability of given investment proposals in the wake of limited resources and manage routine business financial requirements.</li> <li>4. Analyze the given financial statements of a firm to understand the past performance and to make decisions for future.</li> <li>5. Identify the impact of the new tax policies on the company's financial structure/ individuals' incomes.</li> </ol>

**Unit 1: Basics of Economics:**

Scarcity Definition of Economics and its criticisms - Macro and Micro Economics - Managerial Economics - Nature and Scope of Managerial Economics - Meaning of a Firm and Industry - Demand concept and its determinants - Law of Demand with its assumptions and exceptions - Price elasticity of demand and its types, Income elasticity - Cross elasticity - Advertising elasticity - Meaning of Supply - Equilibrium Price and Quantity - Production - Meaning of Production and Production function - Types of Production function - Economies of Scale. (Simple problems on computation of Price elasticity)

**Unit II: Cost and Price:**

Cost- Meaning- Types of Costs- Cost Sheet- Break- even Analysis- Methods of Pricing (Problems on Cost Sheet and Breakeven Analysis can be asked).

**Unit III: Sources and uses of Finance:**

Capital Budgeting - Discounting and Non-discounting Techniques (including simple problems) - Working Capital Management - Concepts and Components of Working Capital - Determinants of working capital - Sources of finance (long term and short term).

**UNIT IV: Understanding Financial Statements:**

Financial Statements - Meaning - Types- Purpose - Ratios (Liquidity, Solvency, activity & Profitability Ratios including problems)

## Unit V: Direct &amp; Indirect Taxes:

Income tax - Heads of Income - Income from Salaries - Income from House Property - Income from Business or Profession - Income from Capital Gains - Income from Other Sources- Old and New regime tax rates and calculation of tax( Latest Tax Rates)- GST- Introduction to GST- CGST - SGST-IGST (Simple problems on Computation of Salaries and House property and Final tax computation)

## 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", Me 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 ofIndia.
8. Narayana swamy, "Financial Accounting: A Managerial Perspective" Prentice Hall India

## 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 Me Graw Hill Publishing

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

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	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: <b>90 Minutes</b>				

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**DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES**

**Skill Development Course - IV - Verbal Aptitude**  
**SYLLABUS FOR BE 3/6 - SECOND SEMESTER (VI Semester)**

L:T: P (Hrs./Week) : 2	SEE Marks: 40	Course Code: <b>U20BS430EH</b>
Credits:1	CIE Marks: 30	Duration of SEE: Hours : 2

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
<p><b>The course will enable the learners to:</b></p> <ol style="list-style-type: none"> <li>1. Introduce students to higher order thinking and problem solving via vocabulary and its various components</li> <li>2. Train students to understand context &amp; theme and use it to complete sentences.</li> <li>3. Train students to identify the structure of sentences &amp; paragraphs</li> <li>4. Train students to analyze text, e.g., simple outlining and note taking, summarize, draw conclusions, and apply information to personal experiences</li> <li>5. Train students to improve the quality of sentences by fixing errors</li> </ol>	<p><b>At the end of the course the learners will be able to: -</b></p> <ol style="list-style-type: none"> <li>1. Use vocabulary as a tool to solve questions in verbal ability</li> <li>2. Identify meanings of words using theme and context</li> <li>3. Solve questions based on jumbles- sentences and paragraphs</li> <li>4. Develop skills to critically analyze texts and then the ability to identify its theme</li> <li>5. Improve the quality of their writing by being aware of the common errors</li> </ol>

**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.

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.

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.

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.

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.

5.1 Concepts- Basic Introduction & Sentence Fillers

5.2 Spot the Errors

5.3 Sentence Improvement

#### METHODOLOGY

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

#### ASSESSMENTS

- Online assignments
- Individual and Group

#### Learning Resources:

[learn.talentsprint.com](http://learn.talentsprint.com)

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

1	No. of Internal tests	:	2	Max. Marks	:	20
2	No. of assignments	:	2	Max. Marks	:	5
3	No. of Quizzes	:	2	Max. Marks	:	5
	Duration of Internal Tests	:	90 Minutes			

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

**COURSE NAME-HUMAN VALUES AND PROFESSIONAL ETHICS-II**

(Common to all branches) SYLLABUS FOR B.E. 3/4

L:T: P (Hrs./Week) : 1:0:0	SEE Marks: 40	Course Code: <b>U20HS010EH</b>
Credits:1	CIE Marks: 30	Duration of SEE: Hours : 2

<p><b>COURSE OBJECTIVES</b>  <b>The course will enable the learners to:</b></p> <ol style="list-style-type: none"> <li>1. Create an awareness on the interrelation between Society, Ethics and Human Values</li> <li>2. Understand how ethical dilemmas apply to real life scenarios</li> <li>3. Develop ethical human conduct and professional competence</li> <li>4. Understand the role of good ethical practices and apply it in a project</li> </ol>	<p><b>COURSE OUTCOMES</b>  <b>At the end of the course the learners will be able to: -</b></p> <ol style="list-style-type: none"> <li>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</li> <li>2. Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, and the objective presentation of data.</li> <li>3. Assess their own ethical values and the social context of problems and articulate what makes a particular course of action ethically defensible</li> <li>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</li> </ol>
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#### **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**

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

- <https://plato.stanford.edu/>

**Learning Resources:**

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

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

1	No. of Internal tests	:	<table border="1"><tr><td>1</td></tr></table>	1	Max. Marks	:	<table border="1"><tr><td>20</td></tr></table>	20
1								
20								
2	No. of assignments	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks	:	<table border="1"><tr><td>5</td></tr></table>	5
2								
5								
3	No. of Quizzes	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks	:	<table border="1"><tr><td>5</td></tr></table>	5
2								
5								

Duration of Internal Tests : 90 Minutes



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**ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LAB**  
**SYLLABUS FOR B.E VI- SEMESTER**

L:T:P (Hrs./week):: 0:0:2	SEE Marks : 50	Course Code : <b>U20PC611IT</b>
Credits : 1	CIE Marks: 30	Duration of SEE : 3 Hrs

Course Objectives	Course Outcomes
<b>The Objectives of the course:</b>	<b>At the end of the course student will be able to:</b>
1. Introduce NumPy arrays, Matplotlib Scikit-Learn packages. 2. Analyse the performance of ML algorithms on benchmark datasets.	1. Implement python programs for storing and manipulating data using NumPy arrays, SciPy and Matplotlib. 2. Perform data preprocessing, analysis and visualizations using Pandas. 3. Apply supervised and unsupervised ML algorithms to real world problems. 4. Evaluate and compare the performance ML algorithms. 5. Choose an appropriate ML algorithm and design a solution for a given problem

1. Python basics for ML using NumPy, Matplotlib and Scikit-Learn packages.
2. Data pre-processing, train, test splits and model evaluation metrics.
3. Predicting the Diabetes progression in a patient based on Age, Gender, BMI, BP and six blood serum measurements on Scikit-Learn Diabetes dataset using Linear Regression.
4. Classifying hand-written digits on Scikit-Learn Digits dataset using Logistic Regression.
5. Classifying different species of Iris flowers on Scikit-Learn Iris dataset using KNN.
6. Classifying hand-written digits on Scikit-Learn Digits dataset using SVM.
7. Classifying hand-written digits on Scikit-Learn Digits dataset using MLP neural network.
8. Detecting spam emails / Sentiment analysis on Movie reviews using Naïve Bayes classification.
9. Unsupervised learning: K-means clustering on scikit learn Iris dataset.
10. Unsupervised learning: DBSCAN clustering on scikit learn Iris dataset.

**Learning Resources:**

1. <https://www.numpy.org/>
2. <https://www.scipy.org/>
3. <https://matplotlib.org/>
4. <https://pandas.pydata.org/>
5. <https://scikit-learn.org/stable/>

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

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

**EMBEDDED SYSTEMS AND IOT LAB**  
**SYLLABUS FOR B.E VI- SEMESTER**

L:T:P (Hrs./week):: 0:0:2	SEE Marks : 50	Course Code : <b>U20PC621IT</b>
Credits : 1	CIE Marks: 30	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
<p>The course will enable the students to:</p> <ol style="list-style-type: none"> <li>Learn programming and interfacing different peripherals with ARM and 8051 microcontrollers and study VxWorks RTO's</li> <li>Design and develop real time embedded system/IoT applications</li> </ol>	<ol style="list-style-type: none"> <li>Write Assembly and embedded C language programs for interfacing various peripherals with ARM/8051 microcontroller.</li> <li>Write programs for interfacing various sensors and actuators with Raspberry Pi/Arduino</li> <li>Develop IoT applications with Wireless technologies like Bluetooth / Zigbee /LoRa</li> <li>Design and implement embedded system applications with SOC's</li> <li>Demonstrate the RTO's concepts by designing basic real time applications</li> </ol>

**I. 8051/ARM programming and Interfacing (Using Keil simulator):**

- Keil introduction and basic programs
- 8051 I/O port programming, Serial Communication programming, Timer programming, Interrupt programming
- Interfacing different peripherals to 8051 / ARM

**II. Internet of Things:**

- Interfacing different sensors and actuators with Raspberry Pi board/Arduino UNO
- Program to operate LED's using push buttons.
- Programs demonstrating communication protocol Bluetooth
- Programs demonstrating communication protocol Zigbee/LoRa
- programs for Publishing data on to cloud and read data from the cloud using MQTT protocol
- Data logs using UHF/WiFi

**III. Programs with VxWorks RTO's**

- multi-Tasking
- Semaphores
- Message Queues

**IV. Experiments with SOC's and EDA (Electronic Design Automation) tool:**

- Designing, Multiplexer, Counters, finite state machines
- Programs demonstrating image processing /speech processing /machine learning

**Additional Experiments:**

Projects on IoT/SOC's

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: 2Hours			

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

**WEB TECHNOLOGIES LAB**  
**SYLLABUS FOR B.E VI- SEMESTER**

L:T:P (Hrs./week):: 0:0:2	SEE Marks : 50	Course Code : U20PC631iT
Credits : 1	CIE Marks: 30	Duration of SEE : 3 Hrs

Course Objective:	Course Outcomes:
<b>The course will enable students to:</b>	<b>At the end of the course student will be able to:</b>
Design and Develop web applications for various platforms using different frameworks and technologies.	1. Design and develop Web pages using HTML, CSS, javascript. 2. Develop Responsive web pages using frameworks. 3. Develop applications using ASP.NET. 4. Develop web applications using React, Node JS and MongoDB

**I-HTML:**

- Creation of HTML Document using basic tags.
- Creation of Menu using ordered and unordered list and other options.
- Creation of web page using table tags and their attributes
- Creation of web page using frames.
- Creation of document using CSS.

**II-JAVASCRIPT & XML:**

- Basic javascript programs using control statements, arrays and functions.
- Write a java script to validate the following fields in a registration page
  - i) Name (should contains alphabets and the length should not be less than 6 characters)
  - ii) Password(should not be less than 6 characters)
  - iii) E-mail(should not contain invalid addresses)
- Creation of XML document and validating it using DTD

**III-BOOTSTRAP**

- Design Responsive web pages using Bootstrap.

**IV-.NET FRAMEWORK**

- Develop an application for implementing Registration, validation, and Login using ASP.NET controls
- Create ASP.NET MVC App that does basic CRUD (create / read / update / delete operations)

**V-NODE JS, REACT and MONGODB**

- Develop web application using Node JS, React and Mongo DB

**Learning Resources:**

1. Robert W. Sebesta, Programming the World Wide Web, 7th Edition (2014), Pearson Education.
2. "Web Technologies", 7th Edition, Uttam K.Roy,2012.
3. Paul J. Deitel, Harvey M. Deitel, Abbey Deitel, Internet & World Wide Web How to Program, 5th Edition, Pearson Education.
4. Dino Esposito, Programming ASP.NET Core (Developer Reference),2018
5. Learning React Functional Web Development with React and Redux by Alex Banks, Eve Porcello, Alex Banks, Eve Porcello
6. Brad Dayley, Brendan Dayley and Caleb Dayley, Node.js, MongoDB and Angular Web Development The definitive guide to using the MEAN stack to build web applications, 2nd Edition, Pearson Education, 2018
7. <http://getbootstrap.com/>
8. <https://reactjs.org/>
9. <https://nodejs.org/en/>

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

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

**THEME BASED PROJECT**  
**SYLLABUS FOR B.E. VI SEMESTER**

L:T:P(Hrs./week):0:0:2	SEE Marks : 50	Course Code : <b>U20PW619IT</b>
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The Objective of the course	<i>On completion of the course, students will be able to</i>
3. Promote project-based learning by working on societal problems. 4. Encourage individual and teamwork, communication, life-long learning and follow professional ethics.	1. Review the existing literature/ models to identify the scope for extension. 2. Apply technical knowledge to develop novel solutions for real life problems. 3. Plan and execute projects by following effective software development life cycle. 4. Design and demonstrate the prototypes. 5. Practice professional ethics, teamwork and lifelong learning.

**Continuous Internal Evaluation (CIE) – 30 marks : To be evaluated by the Internal Examiner**

**Assesment-1 : [5 Marks]**

To be conducted on week-2 : Review of problem Statement, Motivation, Introduction, Use cases and Techstack.

**Assesment-2: [10 Marks]**

To be conducted on week-7: Review of low level design details for all end-to-end use cases.

**Assesment-3: [15 Marks]**

To be conducted on week-15 : Review of final implementation / demonstration of all use cases, presentation and report.

**Semester End Examination (SEE) – 50 marks: To be evaluated by the External Examiner**

Evaluation is done based on the following deliverables:

PowerPoint Presentation	[10 Marks]
Demonstration of the application	[20 Marks]
Project report	[10 Marks]
Viva Voce	[10 Marks]

External Examiner should be appointed from other Institutes or from the industry.

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

<b>S.No.</b>	<b>Dept.</b>	<b>Course Code</b>	<b>Name of the Course</b>	<b>Credits</b>
1	Civil	U20OE610CE	Project Management	3
2	CSE	U20OE610CS	Introduction to Databases	3
3		U20OE620CS	Fundamentals of Cloud Computing	3
4	ECE	U20OE610EC	Internet of Things and Applications	3
5		U20OE620EC	Introduction to Mobile Communications	3
6	EEE	U20OE610EE	Electrical Installation and Safety	3
7	IT	U20OE610IT	Web Application Development & Security	3
8		U20OE620IT	Introduction to Machine Learning	3
9		U20OE630IT	Fundamentals of Machine Learning	
10	Mechanical	U20OE610ME	Additive Manufacturing and its Applications	3
11		U20OE620ME	Alternative Fuels and Energy Systems	3
12		U20OE630ME	Industrial Administration and Financial Management	3
13	H&SS	U20OE510EH	Critical Reasoning	3
14		U20HS610EH	English for Competitive Examinations	3

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

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 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<p>The objectives of this course are to:</p> <ol style="list-style-type: none"> <li>1. Learn the concept of project management along with functions and objectives.</li> <li>2. Understand the various techniques used for project planning such as bar charts, CPM, PERT and crashing of networks.</li> <li>3. Acquire knowledge on various types of contracts, tenders.</li> </ol>	<p>On completion of the course, students will be able to</p> <ol style="list-style-type: none"> <li>1. Understand the objectives, functions and principles of management in projects.</li> <li>2. Practice the network techniques like CPM and PERT for better planning and scheduling of engineering works.</li> <li>3. Analyse the importance of cost and time in network analysis and planning the work accordingly.</li> <li>4. Knowledge on Contracts, Tenders, and Work orders related to the projects.</li> <li>5. Interpret the concept of Linear Programming and solve problems by</li> </ol>

#### 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

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

Department of Computer Science & Engineering

**INTRODUCTION TO DATABASES (OPEN ELECTIVE-IV)**  
SYLLABUS FOR B.E. VI-SEMESTER  
(COMMON FOR CIVIL, ECE, EEE & MECH)

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code :U20OE610CS
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES		COURSE OUTCOMES <i>On completion of the course, students will be able to</i>	
1	Identify different issues involved in the design and implementation of a database system.	1	Identify the functional components of database management system. Create conceptual data model using Entity Relationship Diagram
2	Understand transaction processing.	2	Transform a conceptual data model into a relational model
		3	Design database using normalization techniques
		4	Apply indexing and hashing techniques for effective data retrieval
		5	Explain transaction processing.

**UNIT-I**

**Introduction:** Database System Application, Purpose of Database Systems, View of Data, Database Languages, Relational Database, Database Architecture, Database Users and Administrators.

**Database Design and E-R Model:** Overview of the Design Process, the E-R Model, Constraints, E-R Diagrams.

**UNIT-II**

**Relational Model:** Structure of Relation Database, Relational Algebra Operations, Modification of the Database.

**Structured Query Language:** Introduction, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Views.

**UNIT-III**

**Relational Database Design:** Features of Good Relational Designs, Atomic Domains and first Normal form, Decomposition Using Functional Dependencies.

**UNIT-IV**

**Indexing and Hashing:** Basic Concepts, Ordered Indices, B+ Tree Index Files, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing.

**UNIT-V**

**Transaction Management:** Transaction concept, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation and Atomicity, Serializability, Recoverability.

**Learning Resources:**

1. Abraham Silberschatz, Henry F Korth, Sudharshan S, Database System Concepts, 6th Edition(2011), McGraw-Hill International Edition.
2. Date CJ, Kannan A, Swamynathan S, An Introduction to Database System , 8th Edition(2006) Pearson Education.
3. Raghu Ramakrishna, and Johannes Gehrke, Database Management Systems, 3rd Edition(2003), McGraw Hill.
4. RamezElmasri, Durvasul VLN Somyazulu, Shamkant B Navathe, Shyam K Gupta, Fundamentals of Database Systems, 4th Edition(2006), Pearson Education.
5. Peter rob, Carlos coronel, Database Systems, (2007), Thomoson.
6. <http://nptel.ac.in/courses/106106093/>

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

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

Duration of Internal Tests : 1 Hour 30 Minutes



**VASAVI COLLEGE OF ENGINEERING(Autonomous)**

IBRAHIMBAGH, HYDERABAD – 500 031

**Department of Computer Science & Engineering****FUNDAMENTALS OF CLOUD COMPUTING (OPEN ELECTIVE-IV)**

SYLLABUS FOR B.E. VI-SEMESTER

(COMMON FOR CIVIL, ECE, EEE &amp; MECH)

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code :U20OE620CS
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
1. Understand the basic principles of Cloud computing and compare the various Levels of Virtualization.	1 Explain the cloud enabling technologies and the Cloud service models.
2. Use the theoretical principles for Architectural Design of Compute and Storage Clouds.	2 Choose the levels of virtualization and tools for resource provisioning.
3. Develop Confidentiality Protection and Improve User Access to Cloud Computing using Parallel and Distributed Programming Paradigms	3 Compare the cloud platform architectures for virtualized data centers and Inter-cloud Resource Management.
	4 Analyze the principles of Security and Trust management to protect confidentiality of data in the Cloud.
	5 Create an instance on AWS or Google Cloud.

**UNIT-I**

**Introduction to Cloud Computing:** Cloud Computing in a Nutshell, System Model for Distributed and Cloud Computing, Roots of Cloud Computing, Grid and Cloud, Layers and Types of Clouds, Desired Features of a Cloud, Basic Principles of Cloud Computing, Challenges and Risks, Service Models.

**UNIT-II**

**Virtual Machines and Virtualization** of Cluster and Data Centers, Levels of Virtualization, Virtualization structures/Tools and Mechanism, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resources Management, Virtualization Data-Center Automation.

**UNIT-III**

**Cloud computing architecture over Virtualized data Centers:** Data- Center design and inter connection network, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms, Google Cloud, AWS, Azure, Inter-cloud Resource Management.

**UNIT -IV**

**Cloud Security and Trust Management, Data Security in the Cloud:** An Introduction to the Idea of Data Security, The Current State of Data Security in the Cloud CryptDb: Onion Encryption layers- DET, RND, OPE, JOIN, SEARCH, HOM, and Homomorphism Encryption, FPE. Trust, Reputation and Security Management.

**UNIT -V**

**Cloud Programming and Software Environments:** Features of Cloud Platforms, Parallel and distributed Programming Paradigms, Programming Support of Google Cloud, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

**Suggested Books:**

1. Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Cloud Computing: principles and paradigms (Wiley Series on Parallel and Distributed Computing), (2011), Wiley Publishing (c).
2. Kai Hwag, Geoffrey C. Fox, Jack J. Dongarra, Distributed and Cloud Computing from parallel processing to the internet of things, (2012), Elsevier.
3. Raluca Ada Popa, Catherine M.S. Redfiled, Nickolai Zeldovich, and Hari Balakrishnan, crypt DB Protecting confidentiality with encrypted Query Processing, 23<sup>rd</sup> ACM Symposium on Operating Systems principles (SOSP 2011), Cascais, Portugal October 2011.
4. John W. Rittinghouse, Cloud Computing: Implementation, management, and security, James F. Ransome, (2009), CRC Press.

**Reference Books:**

1. A fully Homomorphc Encryption Scheme, Craig Gentry, September 2009.
2. David Marshall, Wade A. Reynolds, Advanced server virtualization: VMware and Microsoft platform in the virtual Data Center, (2006), Aucrba publications.

**Online resources:**

1. <https://cloudacademy.com/cloud-computing/what-is-cloud-computing-introductory-course/>
2. <http://cloudschool.com/courses>

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

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

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**Internet of Things and Applications (Open Elective)**

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

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: <b>U200E610EC</b>
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.

**CO-PO Mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1												1	1
CO2	3	2					1					1	1	2	2
CO3	3	1												1	1
CO4	3	1			2								1	1	1
CO5	3	2		1		2	2		2			2		2	2

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

Duration of Internal Tests: 90 Minutes

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**Introduction to Mobile Communications (Open Elective)**

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

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: <b>U200E620EC</b>
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.

**CO-PO Mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	1	1								3	
CO2	3	2	2	2		1								3	
CO3	3	2				1								3	
CO4	3	2	2	2	1	1								3	
CO5	3	2		2	1	1								3	

**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:**

- Theodore S. Rappaport, Wireless Communications Principles and Practices, 2<sup>nd</sup> edition, Pearson Education.
- David Tse, Pramodh Viswanath, Fundamentals of Wireless Communication, 2005, Cambridge University Press.
- Name of the course: Introduction to Wireless and Cellular Communications  
Course url: [https://swayam.gov.in/nd1\\_noc19\\_ee48/preview](https://swayam.gov.in/nd1_noc19_ee48/preview)

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

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

Duration of Internal Tests: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)  
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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: U200E610EE
Credits:3	CIE Marks: 40	Duration of SEE: 3Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: Have a fair knowledge about the fundamentals of wiring systems, electrical safety procedures, Estimation of lighting & Power loads.	On completion of the course, students will be able to 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-9<sup>th</sup> 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. CR Dargar -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/](http://www.open.edu/openlearn/)
4. <http://nptel.ac.in/courses/>

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

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

Duration of Internal Tests: 90 Minutes

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

**WEB APPLICATION DEVELOPMENT AND SECURITY**

(OPEN ELECTIVE-IV) (Common for CIVIL, ECE, EEE & MECH)

SYLLABUS FOR B.E VI- SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks : 60	Course Code : <b>U20OE610IT</b>
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
1) Acquire basic skills for designing static and dynamic Web Applications using HTML, CSS, Java Script, Bootstrap and XML. 2) Acquire fundamental knowledge of Web Security concepts	1. Design a static web pages using HTML, CSS. 2. Create dynamic web pages and client side validation using JavaScript. 3. Develop responsive web applications using Bootstrap. 4. Build an application using an MVC Framework and XML 5. Analyze and evaluate web security attacks.

**UNIT-I: Introduction**

Introduction: World Wide Web, Web Browsers, Web Servers, URL, HTTP, TCP Port. HTML: Standard HTML document structure, Basic Tags, Images, Hypertext Links, Lists, Tables, Frames. CSS: In-line style sheets, Internal Style sheets and External Style sheets.

**UNIT-II: Basics of JavaScript**

JavaScript: Introduction, Basics of JavaScript-variables, data types and operators, Control Structures, Arrays, Functions, HTML Forms, Events and event handling.

**UNIT-III: Bootstrap**

**Bootstrap:** The Grid system, Layout components: Tables, Images, alerts, buttons, badges, progress bars, cards, drop downs, pagination, Collapse, Navbar, Carousel.

**UNIT-IV: XML**

XML- The Syntax of XML, XML Document Structure, Document Type Definitions.

**Introduction to MVC** - Introduction to Model View Controller Architecture

**UNIT-V: Web Security Fundamentals**

Web Hacking Basics, HTTP & HTTPS URL, Evolution of Web Applications - Web Application Security - Core Defence Mechanisms - Handling User Access - Handling User Input- Handling Attackers - Managing the Application, Introduction to Web 2.0

**Learning Resources:**

1. Robert W. Sebesta, Programming the World Wide Web, 7th Edition (2014), Pearson Education.
2. "Web Technologies", 7th Edition, Uttam K.Roy, 2012.
3. Paul J. Deitel, Harvey M. Deitel, Abbey Deitel, Internet & World Wide Web How to Program, 5th Edition, Pearson Education.
4. <http://getbootstrap.com/>

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

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

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

**INTRODUCTION TO MACHINE LEARNING**

(OPEN ELECTIVE-IV)

SYLLABUS FOR B.E VI- SEMESTER

(Common for ECE & EEE)

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code: <b>U20OE620IT</b>
Credits: 3	CIE Marks: 40	Duration of SEE :3Hrs

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
Introduce the fundamental concepts, techniques and modern tools in Artificial intelligence and Machine Learning field to effectively apply it to the real-world problems.	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge of the Artificial intelligence and machine learning literature.</li> <li>2. Understand and apply latest Python libraries for Machine learning models.</li> <li>3. Apply an appropriate algorithm for a given problem.</li> <li>4. Apply machine learning techniques in the design of computer systems.</li> <li>5. Explain the relative strengths and weaknesses of different machine learning methods and approaches.</li> </ol>

**UNIT-I:**

**Introduction to AIML:** Foundations of AI, Sub areas of AI, Applications. Introduction to learning, Types of Learning: Supervised Learning, Unsupervised Learning, Reinforcement Learning.

**Introduction to Python and ML libraries:** intro to python data types, control flow, loops, functions, modules & packages. Intro to NumPy & Scikit-learn.

**UNIT-II:**

**Supervised learning:** ML Task, ML Experience or Data, ML Performance metric, Linear Regression, Linear regression Simulator, Logistic Regression.

**Supervised Non-parametric learning:** Introduction to Decision Trees, K-Nearest Neighbor, Feature Selection.

**UNIT-III:**

**Supervised Parametric learning (Neural networks):** Perceptron, Multilayer Neural Network, Playground Simulator, Backpropagation.

**UNIT-IV:**

**Supervised Parametric learning:** Support Vector Machine, Kernel function and Kernel SVM.

**Supervised Parametric Bayesian learning:** Introduction, Naive Bayes Classification, Bayesian Network.

**UNIT-V:**

**Unsupervised learning:** Clustering, K-means Clustering, DBSCAN

**Learning Resources:**

1. Tom Mitchell, Machine Learning, First Edition, McGraw-Hill, 1997
2. Christopher Bishop. Pattern Recognition and Machine Learning. Second Edition.
3. Ethem Alpaydin, Introduction to Machine Learning, Second Edition
4. T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning, 2e, 2008.
5. <http://nptel.ac.in/courses/106106139/>
6. <https://www.w3schools.com/python/>
7. <https://www.w3schools.com/python/numpy/default.asp>
8. <https://scikit-learn.org/stable/>
9. [Linear Regression Simulator \(mladdict.com\)](http://mladdict.com)
10. [Neural Network Playground simulator](http://mladdict.com)
11. <https://www.mladdict.com/neural-network-simulator>

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

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



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

**FUNDAMENTALS OF MACHINE LEARNING**

(OPEN ELECTIVE-IV)

SYLLABUS FOR B.E VI- SEMESTER

(Common for CIVIL & MECH)

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code: <b>U20OE630IT</b>
Credits: 3	CIE Marks: 40	Duration of SEE :3Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	<i>On completion of the course, students will be able to</i>
Introduce the fundamental concepts, techniques and modern tools in Artificial intelligence and Machine Learning field to effectively apply it to the real-world problems.	6. Demonstrate knowledge of the Artificial intelligence and machine learning literature. 7. Understand and apply latest Python libraries for Machine learning models. 8. Apply an appropriate algorithm for a given problem. 9. Apply machine learning techniques in the design of computer systems. 10. Explain the relative strengths and weaknesses of different machine learning methods and approaches.

**UNIT-I:**

**Introduction to AIML:** Foundations of AI, Sub areas of AI, Applications. Introduction to learning, Types of Learning: Supervised Learning, Unsupervised Learning, Reinforcement Learning.

**Introduction to Python and ML libraries:** intro to python data types, control flow, loops, functions, modules & packages. Intro to NumPy & Scikit-learn.

**UNIT-II:**

**Supervised learning:** ML Task, ML Experience or Data, ML Performance metric, Linear Regression, Linear regression Simulator, Logistic Regression.

**UNIT-III:**

**Supervised Parametric learning (Neural networks):** Perceptron, Multilayer Neural Network, Playground Simulator, Backpropagation.

**UNIT-IV:**

**Supervised Parametric learning:** Support Vector Machine.

**Supervised Parametric Bayesian learning:** Introduction, Naive Bayes Classification.

**UNIT-V:**

**Unsupervised learning:** Clustering, K-means Clustering, DBSCAN

**Learning Resources:**

12. Tom Mitchell, Machine Learning, First Edition, McGraw-Hill, 1997
13. Christopher Bishop. Pattern Recognition and Machine Learning. Second Edition.
14. Ethem Alpaydin, Introduction to Machine Learning, Second Edition
15. T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning, 2e, 2008.
16. <http://nptel.ac.in/courses/106106139/>
17. <https://www.w3schools.com/python/>
18. <https://www.w3schools.com/python/numpy/default.asp>
19. <https://scikit-learn.org/stable/>
20. [Linear Regression Simulator \(mladdict.com\)](http://mladdict.com)
21. [Neural Network Playground simulator](http://mladdict.com)
22. <https://www.mladdict.com/neural-network-simulator>

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

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

Duration of Internal Tests : 90 Minutes

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

DEPARTMENT OF MECHANICAL ENGINEERING

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

L:T:P (Hrs./week): 3:0:0	SEE Marks:60	Course Code: <b>U200E620ME</b>
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 its 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

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

**Industrial Administration and Financial Management**  
(Open Elective-IV) SYLLABUS FOR B.E VI Semester

Instruction: 3 Hrs / week	SEE Marks:60	Course Code: U200E630ME
Credits: 3	CIE Marks:40	Duration of SEE : 3 Hours

Course objectives	Course Out comes
<p>The objectives of this course are to:</p> <ol style="list-style-type: none"> <li>1. aware about types of business forms, organization structures, plant layouts, merits, demerits and applications.</li> <li>2. understand method study procedure, PME, time study techniques and wage incentives.</li> <li>3. importance of PPC and improving quality by control charts and sampling plants.</li> <li>4. optimization of inventory to minimize total cost and other optimization techniques like LPP, project management techniques.</li> <li>5. estimate selling price of a product, TVM and budgeting techniques, depreciation methods.</li> </ol>	<p>On completion of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. understand business forms, organization structures and plant layouts.</li> <li>2. implementation of method study and estimation of standard time.</li> <li>3. understand types of production, functions of PPC, quality control by charts and sampling.</li> <li>4. implement optimization techniques like LPP, assignment and project management techniques.</li> <li>5. understand BEA, estimation of depreciation, selling price of a product and capital budgeting techniques.</li> </ol>

#### 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", 5<sup>th</sup> Ed. , PHI , 2005
4. S N Chary, "Production and Operations Management", 3<sup>rd</sup> 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

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

### Critical Reasoning

(Open Elective) SYLLABUS FOR B.E. 3/4- VI SEMESTER

Instruction: 3 Hours	SEE: 60	Course code: U20OE510EH
Credits: 3	CIE: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<p>The course will enable the learners to:</p> <ol style="list-style-type: none"> <li>1. Identify the alternative solutions to the problem or case.</li> <li>2. Derive solution or discuss the best solution(s) to the problem or case.</li> <li>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.</li> <li>4. Students will be trained to use effective methods like elimination of options and shortcuts to solve problem accurately.</li> <li>5. Students will be trained to use effective methods like decision making and shortcuts to solve problems accurately.</li> </ol>	<p>At the end of the course the learners will be able to: -</p> <ol style="list-style-type: none"> <li>1. Analyse and use techniques for Venn diagrams to solve questions effectively.</li> <li>2. Demonstrate the difference between deductive and inductive reasoning.</li> <li>3. Evaluate and distinguish between strong and weak assumption and conclusions.</li> <li>4. Evaluate a select the right arguments from the given statements.</li> <li>5. Evaluate and choose the right decision for the given situation</li> </ol>

#### 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	:	<input type="text" value="2"/>	Max. Marks	:	<input type="text" value="30"/>
2	No. of assignments	:	<input type="text" value="3"/>	Max. Marks	:	<input type="text" value="5"/>
3	No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks	:	<input type="text" value="5"/>
Duration of Internal Tests		:	90 Minutes			

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

**English for Competitive Examinations**  
(Open Elective) SYLLABUS FOR B.E. 3/4 – VI SEMESTER

Instruction: 3 Hours	SEE: 60	Course code: U20OE610EH
Credits: 3	CIE: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<p>The course will enable the learners to:</p> <ol style="list-style-type: none"> <li>To familiarize the students to various types of competitive examinations.</li> <li>To practice questions and prepare for GATE.GRE.CAT.TOEFL.</li> </ol>	<p>At the end of the course the learners will be able to: -</p> <ol style="list-style-type: none"> <li>The students will be able to solve various types of questions in competitive English examinations effectively.</li> <li>Provide logical conclusions for the questions aptitude and reasoning within the stipulated time.</li> </ol>

**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:**

- Analyzing 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 summarizing 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 sentence.
- Jumbled paragraph (word meaning based questions).
- Analogies.
- Para odd one out.
- Summary (facts, assumptions, judgments).
- 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**

- Case Studies
- Demonstration

**ASSESSMENTS**

- Online assignments
- Individual and Group

- Presentations
- Expert lectures
- Writing and Audio-visual lessons

**LEARNING RESOURCES**

learn.talentsprint.com

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

1	No. of Internal tests	:	<input type="text" value="2"/>	Max. Marks	:	<input type="text" value="30"/>
2	No. of assignments	:	<input type="text" value="3"/>	Max. Marks	:	<input type="text" value="5"/>
3	No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks	:	<input type="text" value="5"/>
	Duration of Internal Tests	:	90 Minutes			