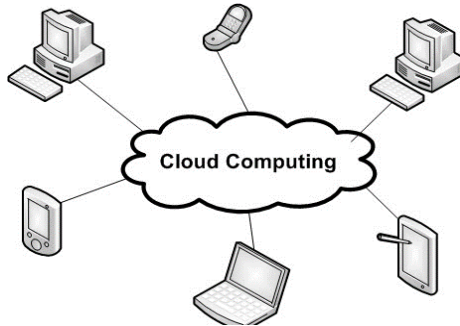# VASAVI COLLEGE OF ENGINEERING
(Autonomous)
IBRAHIMBAGH, HYDERABAD-500 031

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

**Sponsored by
VASAVI ACADEMY OF EDUCATION
Hyderabad**

**SCHEME OF INSTRUCTION AND SYLLABI UNDER CBCS FOR
B.E. (IT) V and VI Semesters with effect from 2019-20
(For the batch admitted in 2017-18)**

**DEPARTMENT OF INFORMATION TECHNOLOGY
+91-40-23146050, 23146051
Fax: +91-40-23146090
Website: www.vce.ac.in**

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION (R-17)
B.E. – INFORMATION TECHNOLOGY : FIFTH SEMESTER (2019 - 2020)

Course Code	Course Name	Scheme of Instruction Hours per week			Scheme of Examination Duration in Hrs	Maximum Marks		Credits
		L	**T**	**P/D**		**SEE**	**CIE**	
HS510EH	Finishing School–III : Soft Skills	1	-	-	2	40	30	1
PC510IT	Computer Networks	3	-	-	3	60	40	3
PC520IT	Microprocessors and Interfacing	3	-	-	3	60	40	3
PC530IT	Operating Systems	3	-	-	3	60	40	3
PC540IT	Software Engineering	3	-	-	3	60	40	3
PC550IT	Theory of Automata	3	-	-	3	60	40	3
PE510IT	Finishing School–III : Technical Skills	1	-	-	2	40	30	1
OE5XXXX	Open Elective – IV	3	-	-	3	60	40	3
PRACTICALS								
PC511IT	Computer Networks Lab	-	-	2	3	50	30	1
PC521IT	Microprocessors and Interfacing Lab	-	-	2	3	50	30	1
PC531IT	Operating Systems Lab	-	-	2	3	50	30	1
PC541IT	Software Engineering Lab	-	-	2	3	50	30	1
Student should complete one online certificate course during III-VIII Semester								
Total		**20**	**-**	**8**	**-**	**640**	**420**	**24**
Grand Total		**28**		**-**	**1060**			

Note:
1. *One hour is allotted to Library / Sports / Proctorial 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)

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

FINISHING SCHOOL-III : SOFT SKILLS

SYLLABUS FOR BE V SEMESTER

L:T:P(Hrs/Week) : 1:0:0	SEE Marks : 40	Course Code: **HS510EH**
Credits: 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
This is a foundation course and aims at enhancing employability skills in students.	At the end of the course students will be able to:
1. Students will be introduced to higher order thinking skills and problem solving on the following areas - Arithmetic ability, Numerical ability and General reasoning.	1. Solve questions on the above mentioned areas using short cuts and smart methods.
2. Students will be trained to work systematically with speed and accuracy while problem solving.	2. Understand the fundamentals concept of Aptitude skills.
	3. Perform calculations with speed and accuracy.

UNIT 1: QUANTITATIVE APTITUDE - NUMERICAL ABILITY

- Introduction to higher order thinking skills

- Speed Maths

- Number systems

- LCM & HCF

UNIT 2: QUANTITATIVE APTITUDE- ARITHMETIC ABILITY FOUNDATION

- Percentage

- Profit loss and discounts

- Ratio proportions Allegations and mixtures

- Averages

UNIT 3: REASONING ABILITY – GENERAL REASONING PART 1

- Coding decoding

- Directions

- Series completions - Letter, Number & Element Series

UNIT 4: REASONING ABILITY- GENERAL REASONING PART 2

- Analogies

- Classification

- Alphabet test

- Blood Relations

UNIT 5: REASONING ABILITY- ARITHMETIC REASONING

- Mathematical operations

- Ranking

- Ages

- Clocks & Calendars

Learning Resources:

1. scoremore.talentsprint.com

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

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

Duration of Internal Tests   :   90 Minutes

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

Department of Information Technology

COMPUTER NETWORKS
SYLLABUS FOR V-SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code : **PC510IT**
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES		COURSE OUTCOMES *On completion of the course, students will be able to*	
1	Understand the fundamental concepts of computer networks and Socket programming, know the role of various layers and protocols and security policies.	1	Identify different types of network models and underlying network hardware and software and their functionalities, network I/O using sockets.
		2	understand the network layer services like routing algorithms and congestion control mechanisms.
		3	Describe the Transport layer protocols.
		4	Identify different application layer services like protocols, email, WWW, DNS.
		5	Understand various cryptographic methods and algorithms.

UNIT – I:
Introduction: Uses of Computer Networks, Network Hardware, Network Software: Reference Models (ISO -OSI, TCP/IP).
Network Programming: Socket Interface: Sockets, Socket Address structures, Elementary Sockets, Advanced Sockets: Socket Options, Out of Band data, Daemon process and Internet Super Server.
Remote Procedure Calls: Introduction, Transparency Issues and Sun RPC.

UNIT – II:
Network Layer: Introduction: Forwarding and routing, Routing Algorithms, Congestion Control Algorithms, Quality of Service.
Internetworking: Concatenated virtual circuits, Connectionless Internetworking, Tunneling, Internetwork routing, Fragmentation.

UNIT – III:
Network layer in the Internet: Internet Protocol, IP addresses, IPv4, IPv6, Interoperability of IPv4 and IPv6, Internet Control protocols, OSPF, BGP, Internet Multicasting.
Transport Layer: Overview of the transport layer in the internet, Connection-Oriented Transport: TCP, Connectionless Transport: UDP.

UNIT – IV:
Application Layer:
World Wide Web: Architectural Overview, Static Web Documents, Dynamic Web Documents, HTTP, FTP.
Electronic Mail: SMTP, Comparison with HTTP, Mail Message Formats and MIME, Mail Access Protocols.
DNS: The Internet's Directory service: Services provided by DNS, Overview of How DNS works, DNS Records and Messages.

UNIT – V:
Network Security: Cryptography, Symmetric Key Algorithms, Public Key Algorithms, Digital Signatures, Management of Public Keys, Authentication Protocols.

Learning Resources:
1. Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, 5th Edition, Pearson, 2012.
2. W. Richard Stevens, "Unix Network Programming" Prentice Hall/Pearson Education, 2009.
3. James F. Kurose, Keith W. Ross, "Computer Networking, A Top-Down Approach Featuring the Internet", Sixth Edition, Pearson Education, 2012.
4. William Stallings, "Data and Computer Communications", Tenth Edition, Pearson Education, 2013.
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	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests   :   90 Minutes

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Department of Information Technology

MICROPROCESSORS AND INTERFACING
SYLLABUS FOR V-SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code : **PC520IT**
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES		COURSE OUTCOMES *On completion of the course, students will be able to*
The course will enable the students to understand the architectural features of 8085 and 8086 microprocessors and use them in assembly language programming and interfacing with different peripherals.	1	Distinguish between microprocessors and microcontrollers and use the assembly language instructions of 8085 and program it.
	2	Understand the architectural feature of 8086/8088 microprocessors.
	3	Do assembly language programming using 8086/8088 microprocessors.
	4	Explain the special architectural features and the different interrupts of 8086/8088 microprocessors
	5	Interface various peripherals to 8086/8088 microprocessors

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.

<u>**Learning Resources :**</u>
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 2nd 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, 8th 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	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests   :   90 Minutes

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Department Of Information Technology

OPERATING SYSTEMS
Syllabus for B.E V- SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code :**PC530IT**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The Objectives of the course:	*On completion of the course, students will be able to:*
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 7 : 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.

<u>**Learning Resources:**</u>
1. Operating System Concepts - Operating System Concepts, Ninth Edition, Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, John Wiley & Sons Inc.
2. Modern Operating Systems- Andrew S Tanenbaum, Prentice Hall
3. Operating Systems - Operating System: Internals and Design Principles , William Stallings
4. Operating Systems - System Programming and Operating Systmes D M Dhamdhere, Tata Mc Graw Hill
5. Operating Systems - Operating Systems: A Modern Perspective, Gary Nutt, Addison Wesley
6. Operating Systems - Operating Systems, Achyut S Godbole, Tata Mc Graw Hill
7. Design of the Unix Operating System - Maurice Bach, Prentice Hall.
8. https://nptel.ac.in/courses/106108101/
9. 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	:	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)
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Department Of Information Technology

SOFTWARE ENGINEERING
Syllabus for B.E V- SEMESTER

L:T:P (Hrs./week):: 3:0:0:	SEE Marks : 60	Course Code : **PC540IT**
Credits : 3	CIE Marks: 40	Duration of SEE : 3 Hrs

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

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

UNIT-II: Understanding Requirements,Design Engineering
Understanding requirements: Requirement Analysis, Data Modeling Concepts, Scenario-Based Modeling, Flow-Oriented Modeling, Class-Oriented Modeling, Creating a Behavioral Modeling

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

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

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

UNIT-V: Product Metrics, Risk Management
Product Metrics: A Framework for Product Metrics, Metrics for the Requirements Model, Metrics for the Design Model, Metrics for Testing, and Metrics for Maintenance.
Risk Management: Software Risks, Reactive Vs Proactive Risk Strategies, Risk Mitigation, Monitoring and management, and RMMM Plan.

Learning Resources:
1. Roger S.Pressman, Software Engineering: A Practitioners Approach, Seventh Edition, McGraHill, 2009.
2. Pankaj Jalote "An Integrated Approach to Software Engineering, Third Edition, Narosa Publishing house, 2008.

3. James F.Peters, WitoldPedrycz, Software Engineering-An engineering Approach, John Wiley Inc., 2000.
4. Ali Behforoz and Frederic J.Hadson, Software Engineering Fundamentals, Oxford University Press, 1997.
5. https://nptel.ac.in/downloads/106105087/

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	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

THEORY OF AUTOMATA
Syllabus for B.E V-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **PC550IT**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
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.	1. Design finite automata, RE's for a given language. 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. 3. Design PDA's for various CFG's and CFL's, simplify the CFG's, define properties of CFL's. 4. Define programming techniques of Turing machines and design Turing machines for decidable problems 5. Apply mathematical and formal techniques for solving problems in computer science and also define concepts of computability theory, and complexity theory.

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

Duration of Internal Tests   :   90 Minutes

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Department of Information Technology

COMPUTER NETWORKS LAB
SYLLABUS FOR B.E. V SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks :50	Course Code: **PC511IT**
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

COURSE OBJECTIVES		COURSE OUTCOMES *On completion of the course, students will be able to*	
1	Understand the use of client/server architecture in application development, use socket system calls to implement network applications, to develop simple network monitoring services.	1	Demonstrate the usage of socket system calls and basics of network programming
		2	Use network programming concepts to develop client-server applications.
		3	Implementation of chat-server, time service etc.
		4	Implementation of application layer protocols

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 of the day server.
8. Implementation of remote command execution using socket system calls.
9. Implementation of file access using RPC(FTP).
10. Implementation of HTTP.
11. implementation of Concurrent chat server(current Logged in users)
12. Implementation of Ping service.

Note: Implement programs in C Language using LINUX platform.

Learning Resources:
1. W. Richard Stevens, "Unix Network Programming", Prentice Hall, PearsonEducation,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			

VASAVI COLLEGE OF ENGINEERING (Autonomous)
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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: **PC521IT**
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*		
The course will enable the students to write assembly language programs using 8085 and 8086 microprocessors.	1	Do basic assembly language programming using 8085 microprocessor	
	2	Do basic assembly language programming using 8086 microprocessor.	
	3	Interface various peripherals to 8086 microprocessor.	

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

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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 :**PC531IT**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
Learn the usage of system calls along with applying the concepts of inter process communication and process synchronization.	1. Write programs which interact with the operating system using system calls . 2. Write programs to demonstrate inter process communication. 3. Write programs to demonstrate process synchronization. 4. Write programs for threads creation and manipulation.

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

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)
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Department of Information Technology
SOFTWARE ENGINEERING LAB
SYLLABUS FOR B.E. V SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks :50	Course Code: **PC541IT**
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

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

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

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

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

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

INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS
(Open Elective-IV)
SYLLABUS FOR B.E. V SEMESTER
(for other Branches)

L : T : P (Hrs./week): 3:0:0	SEE Marks :60	Course Code :**OE510IT**
Credits :3	CIE Marks: 40	Duration of SEE :3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
Apply the concepts of database management systems and design relational databases.	1. Understand functional components of the DBMS and develop ER model for a given problem and map ER it to Relational model 2. 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. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, Third Edition, McGraw-Hill International Edition, 2003.
3. Elmasri, Navathe, Somayajulu and Gupta, Fundamentals of Database System, 6th Edition, Pearson Education, 2011.
4. Patric O'Neil, Elizabeth O'Neil, Database-principles, programming, and performance,Morgan Kaufmann Publishers, 2001.
5. Peter Rob, Carlos coronel, Database Systems, (2007), Thomoson.
6. https://nptel.ac.in/courses/106105175/

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

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

Duration of Internal Tests : 90 Minutes

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

INTRODUCTION TO STATISTICAL PROGRAMMING
(Open Elective-IV)
SYLLABUS OF B.E V- SEMESTER
(for other Branches)

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code :**OE520IT**
Credits : 3	CIE Marks: 40	Duration of SEE :3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*	
The course will enable the students to apply the R programming language in the analysis of Statistical data.	1	Write simple programs in R language to manipulate and visualize the data.
	2	Write complex program using different constructs of R language to solve simple problems.
	3	Use R programming language in the simulation of different types of random variables.
	4	Write programs using R language in the analysis and computation of different matrix operations.
	5	Use R programming language in the simulating multivariate random numbers, Markov chain, and Monte carlo integration

Unit I: Introduction to R Language
Basic features of R, Built-in functions, logical vectors and relational operators, Data input and output, programming statistical graphs- High-level plots, low level graphic functions.

Unit II: Programming with R
Flow control, Managing complexity through functions, Miscellaneous programming tips, Debugging and maintenance, Efficient programming.

Unit III: Simulation
Montecarlo simulation, Generation of pseudo random numbers, Simulation of other random variables-Bernouli, Binomial, Poisson, Exponential and Normal random variables.

Unit IV: Computational Linear Algebra
Vectors and matrices in R, Matrix multiplication and inversion, Eigen values and Eigen vectors

Unit V: Advances Simulation methods
Multivariate random number generation, Markov Chain Simulation, Monte Carlo Integration, other Advanced Simulation methods

Learning Resources:
1. A first Course in Statistical Programming with R, W. John Braun, Duncan J. Murdoch, Cambridge University Press, 2007.
2. 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)
SCHEME OF INSTRUCTION AND EXAMINATION (R-17)
B.E. – INFORMATION TECHNOLOGY : SIXTH SEMESTER (2019 - 2020)

Course Code	Course Name	Scheme of Instruction Hours per week L	T	P/D	Scheme of Examination Duration in Hrs	Maximum Marks SEE	CIE	Credits
		SEMESTER - VI						
HS040EH	Economics and Finance for Engineers	2	-	-	3	60	40	2
HS620EH	Finishing School –IV : Soft Skills	1	-	-	2	40	30	1
PC610IT	Artificial Intelligence and Machine Learning	3	-	-	3	60	40	3
PC620IT	Embedded Systems	3	-	-	3	60	40	3
PC630IT	Web Technologies	3	-	-	3	60	40	3
PE610IT	Finishing School –IV : Technical Skills	1	-	-	2	40	30	1
OE6XXXX	Open Elective - V	3	-	-	3	60	40	3
MC040EH	Human Values and Professional Ethics – II	1	-	-	2	40	30	1
PRACTICALS								
PC611IT	Artificial Intelligence and Machine Learning Lab	-	-	2	3	50	30	1
PC621IT	Embedded Systems Lab	-	-	2	3	50	30	1
PC631IT	Web Technologies Lab	-	-	2	3	50	30	1
P6191IT	Mini Project – III	-	-	2	-	-	30	1
Student should complete one online certificate course during III-VIII Semester								
Total		17	-	8	-	570	410	**21**
Grand Total		25			-	980		

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

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

ECONOMICS AND FINANCE FOR ENGINEERS
SYLLABUS For B.E-VII SEMESTER
(STUDENTS ADMITTED IN 2016-17)

L:T:P(Hrs/week) : 2:0:0	SEE Marks : 60	Course Code: **HS040EH** HS500EH
Credits: 2	CIE Marks : 40	Duration of SEE : 03 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
The objective of the Course is to equip the prospective engineers with the concepts and tools of economics, finance, cost and taxes for business decisions	1. Decide appropriate price for goods and services with the company's given cost structure for an estimated profit of the companies.
	2. Analyze the given financial statements of a firm to Understand its past financial performance in the market.
	3. Compare the long term financial investment proposals to decide whether a proposal is financially viable or not through capital budgeting techniques.
	4. Identify the suitable sources of finance for the company by considering the functions of major banks such as SBI and RBI.
	Calculate the impact of the new tax policies on the company's financial structure/ individual incomes.

Unit I:Basics of Economics:
Scarcity Definition of Economics - Macro and Micro Economics -Managerial Economics - Meaning of a Firm - Objectives of a Firm - Profit Maximization - Demand Concept -Price Elasticity of Demand -Meaning of Supply - Equilibrium Price and Quantity -Production -Cobb Doughlas Production Function - Economies of Scale.
Unit II: Cost and Price:
Cost - Meaning -Classification of Costs -Short run and Long run costs -Cost Sheet - Break even Analysis - Methods of Pricing (Problems on Cost Sheet, Breakeven Analysis and Methods of Pricing can be asked).
Unit III: Banking & Finance:
RBI and its role -Commercial Banks - Functions -Capital Budgeting -Discounting and Non discounting Techniques-Working Capital Management - Concepts and Components of Working Capital - Operating Cycle.
UNIT IV: Understanding Financial Statements:
Financial Statements- Meaning - Types -Purpose - Ratios (Liquidity, Solvency & Profitability Ratios)(Problems can be asked on Ratios)
Unit V:Direct & Indirect Taxes:
Heads of Income - Income from Salaries - Income from House Property - Income from Business - Income from Capital Gains -Income from Other Sources - Latest Tax Rates - GST -CGST - SGST - IGST - GST network.

Learning Resources :
1. S.P.Jain and K.LNarang., "Cost Accounting", Kalyani Publishers, Twentieth Edition Revised– 2008.
2. S.P.Jain and K.L Narang., "Financial Accounting", Kalyani Publishers –2002.
3. Mehta P.L.,"Managerial Economics: Analysis, Problems and Cases", Thirteenth Edition, Sultan Chand and Sons, Nineteenth Edition - 2013.
4. M.Y.Khan and P.K. Jain., "Financial Management – Text, Problems and Cases", Mc Graw Hill Education Private Limited, New Delhi.
5. Vinod KSinghania and Kapil Singhania., "Direct Taxes Law and Practice", Taxmann Publications, Sixtieth Edition - 2018.
6. Dr,Vinod K Singhania., "Students' Guide to GST and Customs Law", Taxmann Publications, Edition - 2018.
7. Muralidharan., "Modern Banking", Prentice Hall of India.
8. *M. L. Seth., "Micro Economics",* Lakshmi Narain Agarwal.
9. Dr. R.P. Rustagi., "Fundamentals of Financial Management"Taxmann Publications.
10. Dr. D.M. Mithani, "Money Banking International Trade & Public Finance", Himalaya Publishing House - 2014.
11. Rajesh., "Banking Theory and Practice", Tata Mc Graw Hill Publishing

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal 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 HUMANITIES & SOCIAL SCIENCES

FINISHING SCHOOL-IV: SOFT SKILLS
SYLLABUS FOR BE VI-SEMESTER

L:T:P(Hrs/Week) : 1:0:0	SEE Marks : 40	Course Code: **HS620EH** U19HS610EH
Credits: 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
This is a foundation course and aims at enhancing employability skills in students.	At the end of the course students will be able to:
1. Students will be introduced to higher order thinking skills and problem solving on the following areas - Arithmetic ability, Numerical ability and General reasoning.	1. Solve questions on the above mentioned areas using short cuts and smart methods.
2. Students will be trained to work systematically with speed and accuracy while problem solving.	2. Understand the fundamentals concept of Aptitude skills.
	3. Perform calculations with speed and accuracy.

UNIT 1 QUANTITATIVE APTITUDE- ARITHMETIC ABILITY ADVANCED

- Time speed and distance
- Time and work
- Interest calculations

UNIT 2 REASONING ABILITY- LOGICAL REASONING

- Arrangements- Linear; Circular; Complex
- Puzzles
- Venn diagrams
- Syllogism
- Cubes & Cuboids
- Dices

UNIT 3 REASONING ABILITY- NON VERBAL REASONING

- Figure Series
- Figure Completion
- Mirror Images
- Water Images
- Paper Cutting
- Paper Folding
- Embedded Images

UNIT 4 REASONING ABILITY- CRITICAL REASONING PART 1

- Statement Assumptions
- Statement Arguments

UNIT 5 REASONING ABILITY- CRITICAL REASONING PART 2

- Course Of Action
- Cause & Effect
- Inferences

<u>Learning Resources:</u>
1. scoremore.talentsprint.com The break-up of CIE: Internal Tests + Assignments + Quizzes

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

Duration of Internal Tests   :   90 Minutes

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: **PC610IT**
Credits : 3	CIE Marks: 40	Duration of SEE :3Hrs

Course Objectives	Course Outcomes
The Objectives of the course:	**At the end of the course student will be able to:**
1. Introduce the fundamental concepts of logic programming, searching strategies in Artificial Intelligence. 2. Discuss supervised and unsupervised Machine Learning algorithms and evaluation metrics to validate the performance. 3. Introduce the basics of deep learning and reinforcement learning.	1. Apply appropriate search strategies for solving a given search problem. 2. Apply logic concepts to prove inferences from the given premises. 3. Apply appropriate parametric, non-parametric ML algorithm and ensemble learning for a given classification problem and validate. 4. Understand the fundamentals of deep learning and reinforcement learning and develop a multi-layer neural network to solve a classification problem. 5. Identify clusters from unlabelled data and validate.

UNIT-I:
Introduction to AI: Introduction, Foundations of AI, Sub areas of AI, Applications.
Problem solving: State Space Search and Control Strategies, Characteristics of Problem, Exhaustive Searches, Heuristic Search Techniques.
Logic concepts and Inference: Propositional Logic, Resolution Refutation in Propositional logic, Predicate Logic.
UNIT-II:
Introduction to learning: Types of Learning: Supervised Learning, Unsupervised Learning, Reinforcement Learning.
Supervised learning:ML Tasks, Experience and Metrics, Probability Basics, Linear Regression, Logistic Regression.
Supervised Non-parametric learning: Introduction to Decision Trees, Learning Decision Tree, Overfitting. K-Nearest Neighbor, Feature Selection, Feature Extraction, Collaborative Filtering.
UNIT-III:
Supervised Parametric learning: Support Vector Machine, Kernel function and Kernel SVM.
Neural networks: Perceptron, Multilayer Neural Network, Backpropagation.
UNIT-IV:
Supervised Parametric Bayesian learning: MAP, Maximum likelihood, Naive Bayes, Bayesian Network.
Complexity theory: Introduction, PAC Learning Model, Sample Complexity, VC Dimension.
Ensemble Learning: Bagging and Boosting
UNIT-V:
Unsupervised leaning: Clustering, K-means Clustering, Hierarchical Clustering, Spectral Clustering, Gaussian Mixture Model.
Learning Resources:
1. Tom Mitchell, Machine Learning , First Edition, McGraw-Hill, 1997
2. Christopher Bishop. Pattern Recognition and Machine Learning. Second Edition.
3. EthemAlpaydin , 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/
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

EMBEDDED SYSTEMS
SYLLABUS FOR VI-SEMESTER

L : T : P (Hrs./week): 3:0:0	SEE Marks :60	Course Code : **PC620IT**
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*	
The course will enable the students to understand the different components of Embedded System Design like the choice of micro processor or the microcontroller, the interfacing of different peripherals to the computing unit, usage of RTOS, and the various software development tools in the design of Embedded Systems.	1	Apply the architectural features of 8051 controller in writing assembly language and Embedded C programs and to interface various peripherals to it.
	2	Understand the architecture and instruction set of ARM7 processor and write simple assembly language programs using it.
	3	Explain the various concepts related to Real Time Operating Systems
	4	Understand the usage of various software Development and Debugging tools and the various protocols like CAN and I2C used in Embedded System design.
	5	Explain the various components related to the design of IoT Based Systems.

UNIT – I:
Introduction, Complex Systems and Microprocessor, Embedded System Design Process, The 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, keyboard.
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 Real- Time Operating Systems: Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment. Vxworks: commands and programming.

UNIT – IV:
 Host and Target machines, embedded software development process, Getting Embedded Software into the Target System, Using Laboratory Tools, Categories of multiprocessors, Bus protocols, 12C bus and CAN bus, multiprocessor system-on-chip (MPSoC), accelerators.

UNIT – V:
Introduction to Internet of Things- Definitions & Characteristics of IoT, Physical Design of IOT-Things in IoT, IoT Protocols, Logical Design of IOT-IoT Functional Blocks, IoT Communication Models, IoT Communication APIs, IOT Enabling Technologies, Various types of IoT Applications , Introduction, IoT Design Methodology. Basic building blocks of an IoT device,
Raspberry Pi: About the board, Raspberry Pi interfaces-Serial, SPI, I2C.

Learning Resources:
1. Wayne Wolf, "Computers and Components", Elsevier.
2. KennethJ.Ayala, "The8051 Microcontroller", Third Edition, , Thomson.
3. Muhammad Ali Mazidi, Janice Gillespie Mazidi, Rolin D. Mc Kinlay, The 8051 Microcontroller and Embedded Systems using Assembly and C, Second Edition, Pearson.
4. David E. Simon, "An Embedded Software Primer", Pearson Education
5. Raj Kamal, "Embedded Systems", Tata McGraw Hill.
6. FrankVahid, TonyGivargis, John Wiley, "Embedded System Design", Wiley Student Edition.
7. W.A. Smith, "ARM Microcontroller Interfacing: Hardware and Software, Eketor, 2010.

8. NPTEL Online Course on Microprocessors and Microcontrollers, Santanu Chattopadhyay.
9. Arshdeep Bahga, Vijay Madisetti, "Internet of Things: A Hands-on Approach", Universities Press.

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

WEB TECHNOLOGIES
SYLLABUS FOR B.E VI- SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks : 60	Course Code :**PC630IT**
Credits :3	CIE Marks: 40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
Acquire basic skills for designing static and dynamic Web Applications using HTML, CSS , Java script , Servlets and JSP's	1. Design a static web pages using HTML, CSS.
	2. Use JavaScript for creating dynamic web pages and client side validation.
	3. Create responsive web pages using Bootstrap
	4. Create web applications using Servlets.
	5. Create web application using basic JSP components like scriptlets, directives and expressions.

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

UNIT-III: Twitter Bootstrap & Zurb Foundation
Bootstrap: The Grid system, Layout components: Tables, Images, Jumbotron, alerts, buttons, badges, progress bars, cards, drop downs, pagination, Collapse, Navbar, forms, inputs, carousel.

UNIT-IV: Introduction to Servlets
Introduction to Servlets, Container, Servlet Life Cycle and API, Deployment Descriptor , Servlet Config and Servlet Context, Listeners, Session Management, Model View Controller (MVC) Pattern.

UNIT-V: JSP
Basic JSP's : Introduction to Java Server Pages, JSP vs Servlet, Scriptlets, Directives, Attributes, Expressions, Declarations, Comments, Implicit Objects, Life Cycle of a JSP, Attributes in a JSP.

Learning Resources:
1. "Web Technologies", 7th Edition, Uttam K.Roy,2012.
2. "Internet & World Wide Web How to Program", 5/e, Paul J. Deitel, Harvey M. Deitel, Abbey Deitel,2012.
3. Head First Servlets and JSP 2nd Edition, Bryan Basham, Kathy Sierra & Bert Bates, ORielly, 2008.
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
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3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

HUMAN VALUES AND PROFESSIONAL ETHICS-II
SYLLABUS FOR B.E. - BE- V/VI SEMESTER
COMMON FOR ALL BRANCHES

L:T:P(Hrs/Week) : 1:0:0	SEE Marks : 40	Course Code: **MC040EH**
		U19HS020EH
Credits:1	CIE Marks : 30	Duration of SEE : 02 Hours

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

UNIT-1 PERSONAL ETHICS AND PROFESSIONAL ETHICS

a. **PERSONAL ETHICS**: A person 's personal or self-created values and codes of conduct. Civic virtues and Civic sense.

b. **NEED FOR ETHICAL CODES**
Code of Professional Ethics- Observance of the code, Obligations towards the Features of professional ethics: Openness, Transparency, Privacy, Impartiality, Practicality, Loyalty.
Profession, Ethics and Information Security, Deterring Unethical and Illegal Behaviour, Work ethics.

UNIT-2 GENDER SENSITISATION

a. Social issues regarding women - Female infanticide and foeticide,
     dowry & property rights, violence against women.
b. Impact of globalization on the status of women - Political and legal empowerment
c. Women at work- Success stories.

{Post independence and current movements in India (Telengana movement 1948-50, Chipko movement 1973, Navnirman movement 1974, question of Representation in Politics)
Change makers - Shashi Deshpande, Taslima Nasreen, Kumkum Sangari, Veena Mazumdar, Neera Desai.

Women's Studies in India--UGC's initiatives -- Centers for Women's Studies- Capacity building for Women leaders in education—Women development cells-- Women's Studies in the XIth Plan.

Women role models -- Case studies– Indira Gandhi, Kiran Mazumdar, Kiran Bedi, Ela Bhatt, Mother Teresa, PT Usha, Rukminidevi Arundale, Annie Beasant, Sarojini Naidu, Medha Padhkar, Kalpana Chawla, etc.}

MODE Of DELIVERY

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

Relavant Websites,CD's and Documentaries
• Value Education website, Http://www.universalhumanvalues.info UPTU webiste, Http://www.uptu.ac.in

- Story of stuff, Http://www.storyofstuff.com
- AlGore, As Inconvenient Truth, Paramount Classics ,USA
- Charlie Chaplin, Modern Times, United Artists, USA
- IIT Delhi, Modern Technology-The Untold story-Anand Gandhi, Right Here Right Now, Cyclewala production.

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

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

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

Duration of Internal Tests :   90 Minutes

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

Department of Information Technology

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: **PC611IT**
Credits :3	CIE Marks: 30	Duration of SEE :3 Hours

Course Objectives	Course Outcomes
The Objectives of the course:	**At the end of the course student will be able to:**
1. 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 prepossessing, 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 and validation splits and model evaluation metrics.
3. Predicting the Diabetes progression in a patient based on Age, Gender, BMI, BP and six blood serum measurements using Linear regression.
4. Classifying hand-written digits on MNIST dataset using Logistic regression.
5. Classifying hand-written digits on MNIST dataset using SVM.
6. PCA analysis (or eigen faces) and face recognition task using SVM on LFW people database.
7. Sentiment analysis on Movie reviews using Naïve Bayes classification on NLTK data.
8. Classifying hand-written digits on MNIST dataset using MLP neural network.
9. Unsupervised learning: K-means clustering on IRIS dataset.
10. Unsupervised learning: DBSCAN clustering on 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
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

EMBEDDED SYSTEMS LAB
SYLLABUS FOR B.E. VI SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **PC621IT**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
The course will enable the students to learn the instruction set and interfacing techniques of ARM and 8051 microcontrollers and their usefulness in implementing real time embedded system applications.	1 Write Assembly language programs using ARM Microcontrollers.
	2 Write Assembly language programs using 8051 microcontroller.
	3 Write Assembly language programs for interfacing different I/O devices.
	4 Write programs for developing real time applications for embedded system using VxWorks

A. Use of 8-bit and 32-bit Microcontrollers, (such as 8051 Microcontroller, ARM2148 / ARM2378, LPC 2141/42/44/46/48) Microcontroller and C compiler (Keil, Ride etc.) to:

1. Interface Input-Output and other units such as: Relays, LEDs, LCDs, Switches, Keypads, Stepper Motors, Sensors, ADCs, Timers
2. Demonstrate Communications: RS232, IIC and CAN protocols
3. Develop Control Applications such as: Temperature Controller, Elevator Controller, Traffic Controller

B. Development and Porting of Real Time Applications on to Target machines such as Intel or other Computers using any RTOS

I. Understanding Real Time Concepts using any RTOS through Demonstration of:
1. Timing
2. Multi-Tasking
3. Semaphores
4. Message Queues
5. Round-Robin Task Scheduling
6. Preemptive Priority based Task Scheduling
7. Priority Inversion
8. Signals
9. Interrupt Service Routines

II. Application Development using any RTOS:
1. Any RTOS Booting
2. Application Development under any RTOS

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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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 :**PC631IT**
Credits : 1	CIE Marks: 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*	
Be familiar with static Web page design using HTML and style sheets, dynamic web page design using java script and server side scripting languages, and also Responsive web pages.	1.	Design Web pages Using HTML, CSS, JavaScript
	2.	Design Responsive web pages.
	3.	Develop simple applications using servlets
	4.	Develop simple applications using JSP.

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.

JAVASCRIPT:

- Basic javascript programs using control statements, arrays and functions.
- Write a java script to validate the following fields in a registration page
  1. Name (should contains alphabets and the length should not be less than 6 characters)
  2. Password(should not be less than 6 characters)
  3. E-mail(should not contain invalid addresses)

TWITTER BOOTSTRAP

- Design Responsive web pages.

SERVLET &JSP:

- Develop a simple java Servlet application .
- Develop a simple JSP application.

Learning Resources:
1. "Web Technologies", 7th Edition, Uttam K.Roy,2012.
2. Head First Servlets and JSP 2nd Edition, Bryan Basham, Kathy Sierra & Bert Bates, ORielly, 2008.
3. "Internet & World Wide Web How to Program", 5/e, Paul J. Deitel, Harvey M. Deitel, Abbey Deitel,2012.
4. http://getbootstrap.com/

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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DEPARTMENT OF INFORMATION TECHNOLOGY

MINI PROJECT-III
SYLLABUS FOR B.E. VI SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks :--	Course Code : P6191IT
Credits : 1	CIE Marks : 30	Duration of SEE :--

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
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.

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Department of Information Technology

INTRODUCTION TO WEB APPLICATION DEVELOPMENT
(OPEN ELECTIVE-V)
SYLLABUS FOR B.E VI- SEMESTER
(for other Branches)

L:T:P(Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **OE610IT**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
Acquire basic skills for designing static and dynamic Web Applications using HTML, CSS , Java script and PHP.	1. Design a static web pages using HTML, CSS.
	2. Use JavaScript for creating dynamic web pages and client side validation.
	3. Use built-in functions of PHP to perform server side validations and sending emails.
	4. Use built-in functions of PHP to connect , query and fetch results from a database.
	5. Build a PHP application using an MVC Framework.

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: Basics of PHP
Basics of PHP: Data Types, Variables and Operators, Control Structures: If else, Switch Case. Loop: For, ForEach, While, Do While. Functions in PHP, PHP Forms, Cookies & Sessions, File Processing.

UNIT-IV: Advanced PHP
Advanced PHP: PHP E-Mail, Filters, Database Access, OOPS in PHP. Application using PHP.

UNIT-V: Introduction to MVC
Introduction to Model View Controller Architecture, Building Application using a PHP Framework, Testing and Deploying a PHP application.

Learning Resources:
1. "Web Technologies", 7th Edition, Uttam K.Roy,2012.
2. "Internet & World Wide Web How to Program", 5/e, Paul J. Deitel, Harvey M. Deitel, Abbey Deitel,2012.

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

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

Duration of Internal Tests   :   90 Minutes

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Department of Information Technology

INTRODUCTION TO MACHINE LEARNING
(OPEN ELECTIVE-V)
SYLLABUS FOR B.E VI- SEMESTER
(for other Branches)

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code: **OE620IT**
Credits : 3	CIE Marks: 40	Duration of SEE :3Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
Introduce the fundamental concepts and approaches in Artificial intelligence and Machine Learning field to effectively apply techniques to the real-world problems.	1. Demonstrate knowledge of the Artificial intelligence and machine learning literature. 2. Apply an appropriate algorithm for a given problem. 3. Apply machine learning techniques in the design of computer systems. 4. Prove basic results in the theory of learning 5. 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.
Supervised learning: Linear Regression, Logistic Regression.

UNIT-II:
Supervised Non-parametric learning: Introduction to Decision Trees, K-Nearest Neighbor, Feature Selection.
Supervised Parametric learning: Support Vector Machine, Kernel function and Kernel SVM.

UNIT-III:
Supervised Parametric learning (Neural networks): Perceptron, Multilayer Neural Network, Backpropagation.

UNIT-IV:
Supervised Parametric Bayesian learning: Introduction, Naive Bayes Classification, Bayesian Network.

UNIT-V:
Unsupervised leaning: Clustering, K-means Clustering, DBSCAN

<u>**Learning Resources:**</u>
1. Tom Mitchell, Machine Learning,First Edition, McGraw-Hill, 1997
2. Christopher Bishop. Pattern Recognition and Machine Learning. Second Edition.
3. EthemAlpaydin , 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/

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