



Shri. Shamrao Patil (Yadravkar) Educational & Charitable Trust's
Sharad Institute of Technology College of Engineering, Yadrav-Ichalkaranji
An Autonomous Institute

NBA Accredited, Accredited by NAAC 'A' Grade, ISO 9001:2015 Certified

VISION OF THE COMPUTER SCIENCE AND ENGINEERING DEPARTMENT

✦ Vision


To be a center of excellence in Computer Science & Engineering education to prepare professionally competent engineers with lifelong learning attitude for the accomplishment of ever-growing needs of society.

MISSION OF THE COMPUTER SCIENCE AND ENGINEERING DEPARTMENT

✦ Mission

1. To prepare technically and professionally competent engineers by imparting quality education through effective teaching learning methodologies and providing stimulating environment for research and innovation.
2. To develop professional skills and right attitude in students that will help them to succeed and progress in their personal and professional career.
3. To imbibe moral and ethical values in students with concern to society and environment.




Head of the Department
Computer Science & Engineering
SHARAD INSTITUTE OF TECHNOLOGY
COLLEGE OF ENGINEERING
Yadrav (Ichalkaranji) Dist. Kolhapur



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Department of Computer Science and Engineering

Program Outcomes (PO's)

Engineering graduates will be able to,

1. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problem.
2. **Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problem reaching sustained conclusions using first principle of mathematics, natural sciences, and engineering sciences.
3. **Design/ development of solutions:** Design solutions for complex engineering problem and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, 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 information to provide valid conclusions.
5. **Modern tool usage:** Create, select and apply appropriate the techniques, resources and modern engineering and IT tools including 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 engineering practice.
9. **Individual and teamwork:** 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, give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Lifelong learning:** Recognize the need for and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.


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Abbreviations

L:

Lecture

T:

Tutorial

P:

Practical

MSE: Mid Semester

ExamESE: End Semester

Exam TW: Term Work

OE: Oral Exam

POE: Practical and Oral Exam

HSMC: Humanities and Social Sciences including Management courses

BSC: Basic Science Courses

ESC: Engineering Science Courses

PCC: Professional Core Courses

PEC: Professional Elective


Courses OEC: Open Electives

Courses

PROJ: Project work, seminar, and internship in industry or elsewhere MC:

Mandatory Courses




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Department: Computer Science and Engineering

Rev: CSE Course Structure/00/2020-21

Class: S.Y.B.Tech.

Semester: III

Sr. No.	Course Code	Course Type	Course	Teaching Scheme				Evaluation Scheme					Credits
				L	T	P	Total Hrs.	CA1	CA2	MSE	ESE	Total	
1	CS301	BSC	Engineering Mathematics-III	3	1	-	4	10	10	30	50	100	4
2	CS302	PCC	Discrete Mathematical Structures	3	1		4	10	10	30	50	100	4
3	CS303	PCC	Data Structures and its applications	3	-	-	3	10	10	30	50	100	3
4	CS304	PCC	Computer Networks	3	-	-	3	10	10	30	50	100	3
5	CS305	ESC	Digital Design and Microprocessor	3	-	-	3	10	10	30	50	100	3
6	CS306	PCC	Python Programming	-	-	2	2	15	15	-	20	50	1
7	CS307	PCC	Data Structures and its applications Laboratory	-	-	2	2	15	15	-	20	50	1
8	CS308	PCC	Computer Networks Laboratory	-	-	2	2	15	15	-	20	50	1
9	CS309	ESC	Digital Design and Microprocessor Laboratory	-	-	2	2	15	15	-	20	50	1
10	MDC02	MC	Environmental Sciences	2	-	-	2	25	25	-	-	50	Audit
11	HMS01	HSMC	Aptitude Skills-I	1	-	-	1	25	25	-	-	50	1
12	HMS02	HSMC	Language Skills-I			2	2	25	25	-	-	50	Audit
13	PRJ02	PROJ	Mini Project-II			2	2	25	25	-	-	50	Audit
Total				18	2	12	32	210	150	210	330	900	22



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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III

CS301	BSC	Engineering Mathematics-III	3-1-0	4 Credits
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Teaching Scheme:	Examination Scheme:
Lecture: 3 hrs/week Tutorial: 1hr/week	CA1:10 Marks Mid Semester Exam: 30 Marks CA2:10 Marks End Semester Exam: 50 Marks

Pre-Requisites: Engineering Mathematics-I & Engineering Mathematics-II


Course Outcomes: At the end of the course, students will be able to:

CO1	Apply various interpolation methods and finite difference concepts and also Apply numerical integration techniques whenever and wherever routine methods are not applicable.
CO2	Solve the system of simultaneous linear equations by direct & iterative methods.
CO3	Solve the algebraic and transcendental equations by numerical techniques.
CO4	Solve the balanced and unbalanced assignment problems by using Hungarian method.
CO5	Differentiate the ordinary sets and fuzzy sets.
CO6	Apply the concepts of fuzzy theory in engineering.

Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	-	1	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	1	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	1	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	1	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	1	-	-	-	-	-	-	-
CO6	3	2	-	-	-	-	-	1	-	-	-	-	-	-	-




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Course Contents:

Unit 1: Interpolation and Numerical Integration Finite differences: Interpolation/extrapolation using Newton's forward and backward difference formulae, Newton's divided difference and Lagrange's formulae (All formulae without proof). Numerical integration: Simpson's (1/3) th rule, Simpson's (3/8) th rule and Weddle's rule (without proof). Problems.	[8]
Unit 2: Solution of Simultaneous linear Equations Gauss elimination method, Gauss-Jordan method, Iterative method of solution- Jacobi iteration method, Gauss-Seidal iteration method, Relaxation method, Determination of Eigen values by iteration.	[6]
Unit 3: Numerical solution of transcendental & algebraic equations Solution of Algebraic and Transcendental Equation: Bisection method, Method of false position, Secant method and Newton-Raphson method	[6]
Unit 4: Assignment Problems Definition, Balanced and Unbalanced assignment problems; Hungarian method of solving balanced assignment problems; Hungarian method of solving unbalanced assignment problems; Traveling salesmen problem.	[8]
Unit 5: Introduction to Fuzzy sets Basic concepts of fuzzy sets; Crisp set and Fuzzy set; Membership functions; Basic operations on fuzzy sets; Properties of fuzzy sets.	[7]
Unit 6: Fuzzy Arithmetic Fuzzy numbers; Fuzzy cardinality; Operations on Fuzzy number; Fuzzy equations of type $A + X = B$ and $A.X = B$.	[7]
Text books: 1. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers. 2. P. N. Wartikar & J. N. Wartikar, A Text Book of Applied Mathematics (Vol I & II), Pune Vidyarthi Griha Prakashan, Pune. 3. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons. 4. B. V. Ramana, Higher Engineering Mathematics, McGraw-Hill Publications, New Delhi.	
Reference Books: 1. N. P. Bali, A Text Book of Engineering Mathematics, Laxmi Publications, New Delhi. 2. Peter O'Neil, A Text Book of Engineering Mathematics, Thomson Asia Pvt. Ltd., Singapore. 3. C. R. Wylie & L. C. Barrett, Advanced Engineering Mathematics, McGraw Hill Publishing Company Ltd. 4. Operations Research by S. D. Sharma. 5. Fuzzy sets and Fuzzy Logic by George J. Klir, Bo Yuan. 20	



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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III

CS302	PCC	Discrete Mathematical Structures	3-1-0	4 Credits
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Teaching Scheme:	Examination Scheme:
Lecture: 3hrs/week Tutorial: 1hr/week	CA1:10 Marks Mid Semester Exam: 30 Marks CA2:10 Marks End Semester Exam: 50 Marks

Pre-Requisites: Basic Logic, Set, Graph related concepts

Course Outcomes: At the end of the course, students will be able to:

CO1	Illustrate the logic and set concepts.
CO2	Make use of the algebraic structures and morphism
CO3	Categorize the various graphs, path and representation techniques
CO4	Analyze rooted trees, binary search tree and minimal spanning trees
CO5	Solve mathematical problems on combinatory
CO6	Illustrate fundamental structure of mathematical induction

Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	2	2	-	-	-	-	-	-	-	-	-	1	2	-	-
CO2	2	2	-	-	-	-	-	-	-	-	-	1	2	-	-
CO3	2	2	-	-	-	-	-	-	-	-	-	1	2	-	-
CO4	2	2	-	-	-	-	-	-	-	-	-	1	2	-	-
CO5	2	2	-	-	-	-	-	-	-	-	-	2	2	-	-
CO6	2	2	-	-	-	-	-	-	-	-	-	1	2	-	-



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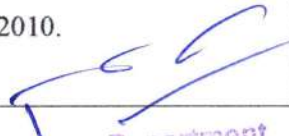


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Course Contents:

Unit1: Mathematical Logic and Set Theory: Propositional logic, Logical connectives, Truth tables, Equivalence of formulas and Tautological Implications, Normal forms, Validity, Predicate logic, Universal and existential quantification, Sets-Defination, types and operation, Venn diagram, Cartesian product, relation, properties of binary relations, partition and covering of set, equivalence relation, composition, POSET, Function	[6]
Unit2: Algebraic systems: Algebraic Structures with one Binary Operation, SemiGroups, Monoids, Groups, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups, Algebraic Structures with two Binary Operation, Rings, Integral Domain and Fields. Boolean Algebra and Boolean Ring, Representation of Boolean Function	[6]
Unit3: Graph Theory Basic terminology, Multi graphs and weighted graphs, Paths and circuits, Shortest path problems, Euler and Hamiltonian paths, Representation of graph, Isomorphic graphs, Connectivity, Matching Coloring, PERT techniques	[6]
Unit4: Trees: Rooted trees, Path length in rooted tree, Binary search trees, Spanning trees and cut set, Minimal spanning trees, Kruskal's and Prim's algorithms for minimal spanning tree	[6]
Unit5: Permutations, Combinations and Discrete Probability: Rule of sum and product, Permutations, Combinations, Discrete Probability, Conditional Probability, Bayes' Theorem, Cardinality and countability, Counting	[6]
Unit6: Principles of Mathematical Induction The Well-Ordering Principle, Recursive definition, Division algorithm: Prime Numbers, The Greatest Common Divisor: Euclidean Algorithm, The Fundamental Theorem of Arithmetic, Recurrence relations, generating functions	[6]
Text Books: 1. Discrete Mathematical Structures with Application to Computer Science - J. P. Tremblay & R. Manohar (MGH International) 2. C. L. Liu, <i>Elements of Discrete Mathematics</i> , McGraw-Hill Publication, 3rd Edition, 2008. Kenneth H. Rosen, <i>Discrete Mathematics and its Applications</i> , McGraw-Hill Publication, 6th Edition, 2010.	
Reference Books: 1. Lipschutz, <i>Discrete Mathematics</i> , McGraw-Hill Publication, 3rd Edition, 2009. 2. V. K. Balakrishnan, <i>Schaum's Outline of Graph Theory</i> , McGraw-Hill Publication, 1st Edition, 1997. 3. Eric Gossett, <i>Discrete Mathematics with Proof</i> , Wiley Publication, 2nd Edition, 2009. 4. Y. N. Singh, <i>Discrete Mathematical Structures</i> , Wiley Publication, 1st Edition, 2010. Dr. Sukhendu Dey, <i>Graph Theory with Applications</i> , SPD Publication, 1st Edition, 2012.	


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S.Y. (Computer Science and Engineering) Semester III

CS303	PCC2	Data Structure and its Applications	3-0-0	3 Credits
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Teaching Scheme:	Examination Scheme:
Lecture: 2hrs/week Tutorial/Practical: 2hr/week	CA-I: 10 Marks CA-II: 10 Marks Mid Semester Exam: 30 Marks End Semester Exam: 50 Marks

Pre-Requisites: Basic Logic, Set, Graph related concepts

CO1	Outline the basics of data structure and its application.
CO2	Outline Concepts of searching and sorting
CO3	Apply Concepts of stack, queue and solve real-time problems.
CO4	Demonstrate the concepts of Linked List and apply various operations on them.
CO5	Demonstrate the concepts of Trees and apply various operations on them
CO6	Demonstrate Basic terminologies and representation of graph and Hashing.

Mapping of course outcomes with program outcomes

Course	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	-	-	-	-	1	-	-	-	1	-	-	1	
CO2	2	-	1	-	1	-	1	-	1	-	1	1	-	-	
CO3	1	-	-	-	1	-	1	-	1	-	1	-	-	-	
CO4	2	2	1	-	2	-	1	-	1	-	1	-	-	-	
CO5	1	-	-	-	1	-	1	-	1	-	1	-	1	-	
CO6	2	2	1	-	1	-	1	-	1	-	1	-	-	1	



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Course Contents:

Unit 1: Introduction to Data Structure Basic Terminology · Elementary data structure organization · Classification of data structure, Operations on data structures · Traversing, Inserting, deleting · Searching, sorting, merging Different Approaches to designing an algorithm · Top-Down approach · Bottom-up approach Complexity · Time complexity · Space complexity , Big 'O' Notation	[6]
Unit 2: Sorting and Searching Techniques Introduction, Selection sort, Insertion sort, Bubble sort, Merge sort, Radix sort (Only algorithm), Shell sort (Onlyalgorithm) Quick sort (Only algorithm) , Searching · Linear search, Binary search	[6]
Unit 3: Introduction to stack and Queue Stack as an abstract data type · Representation of stack through arrays , Applications of Stack , Reversing a list, Polish notations, Conversion of infix to postfix expression, Evaluation of postfix expression, Converting an infix into prefix expression, Evaluation of prefix expression, Recursion	[6]
Unit 4: Linked List Introduction Terminologies: node, Address, Pointer, Information, Next, Null Pointer, Empty list etc.Type of lists · Linear list, Circular list · Doubly list 5.3 Operations on a singly linked list (only algorithm) Traversing a singly linked list · Searching a linked list · Inserting a new node in a linked list · Deleting a node from a linked list.	[6]
Unit 5: Tree Introduction Terminologies, Tree, degree of a node, degree of a tree, level of a node, leaf node, Depth / Height of a tree, In-degree & out- Degree, Directed edge, Path, Ancestor & descendant nodes.Type of Trees · General tree · Binary tree · Binary search tree (BST). Binary tree traversal (only algorithm) · In ordertraversal · Preorder traversal · Post order traversal , Expression tree	[6]
Unit 6: Graph and Hashing Introduction, · Terminologies: graph, node (Vertices), arcs (edge), directed graph, in-degree, out-degree, adjacent, successor,predecessor, relation, weight, path, length. Representations of a graphArray Representation · Linked list Representation, Traversal of graphs · Depth-first search (DFS). · Breadth-firstsearch(BFS). Applications of Graph Hashing, Hash function, Collision resolution techniques	[6]



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Text Books:

1. Thomas Cormen, Introduction to Algorithms, PHI Publication, 2nd Edition, 2002.
2. E. Horowitz, S. Sahani, Fundamentals of Data Structures, Galgotia Publication, 1st Edition, 1983.
3. Kyle Loudon, Mastering Algorithms with C: Useful Techniques from Sorting to Encryption, O'Reilly Media, 1st Edition, 1999
4. Mark Allen Weiss, Data structures and algorithms analysis in C++, Pearson Education, 4th Edition, 2013.

Reference Books:

1. S. Lipschutz, Data Structures, McGraw-Hill Publication, Revised 1st Edition, 2014.
2. Y. Langsam, M. Augenstein, A. Tanenbaum, Data Structure using C and C++, Prentice Hall India Learning Private Limited, 2nd Edition, 1998. Trembley and Sorenson,
3. Introduction to Data Structures, PHI Publication, 2nd Revised Edition, 1983





S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III

CS304	PCC	Computer Networks	3-0-0	3 credits
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Teaching Scheme:	Examination Scheme:
Lecture: 2 hrs/week Practical: 2hr/week	CA1:10 Marks Mid Semester Exam: 30Marks CA2:10 Marks End Semester Exam: 50Marks

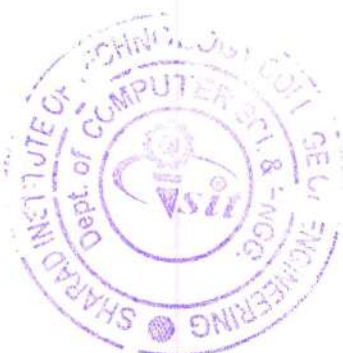
Pre-Requisites: Basics of c programming

Course Outcomes: At the end of the course, students will be able to:

CO1	Outline the basics of computer networks and its application.
CO2	Demonstrate Concepts Network layer concepts.
CO3	Explain the concepts of Transport layer .
CO4	Demonstrate the concepts Congestion control services.
CO5	Explain the concepts of Network security and its application.
CO6	Demonstrate File transfer concepts.

Mapping of course outcomes with program outcomes

Course Outcomes	ProgramOutcomes													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO12	PS O1	PSO2
CO1	1	1	1	-	-	-	-	1	-	-	-	1	-	-
CO2	2	2	-	1	-	1	-	1	-	1	-	1	1	-
CO3	2	1	-	-	-	1	-	-	-	1	-	1	-	-
CO4	1	2	2	1	-	2	-	-	-	1	-	1	-	-
CO5	1	2	-	-	-	1	-	-	-	1	-	1	-	1
CO6	2	2	2	1	-	1	-	1	-	1	-	1	-	-



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Course Contents:

Unit 1 Introduction: Data Communications, Networks, Network Types The OSI model, Introduction to Physical Layer-1: Data and Signals, Digital Signals, Transmission Impairment, Data Rate limits Data link control: DLC services, Data link layer protocols, Point to Point protocol (Framing, Transition phases only). Media Access control: Random Access, Controlled Access and Channelization	[6]
Unit 2 The Network layer: Routing Algorithms: The Link-State (LS) Routing Algorithm, The Distance-Vector (DV) Routing Algorithm, Hierarchical Routing, Routing in the Internet, Intra-AS Routing in the Internet: RIP, TCP: The TCP Connection, TCP Segment Structure, Round-Trip Time Estimation and Timeout, Reliable Data Transfer, Flow Control, TCP Connection Management.	[6]
Unit 3 Transport Layer : Introduction and Transport-Layer Services: Relationship Between Transport and Network Layers, Multiplexing and Demultiplexing, Connectionless Transport: UDP, UDP Segment Structure, UDP Checksum, Pipelined Reliable Data Transfer Protocols, Go-Back-N, Selective repeat, Connection-Oriented Transport	[6]
Unit 4 Congestion Control and QOS: Principles of Congestion Control. Congestion prevention policies, Load shading, Jitter control, Quality of service: Packet scheduling, Traffic shaping, integrated Services	[6]
Unit 5 Network Security: Overview of Network Security: Elements of Network Security Classification of Network Attacks , Security Methods , Symmetric-Key Cryptography : Data Encryption Standard (DES), Advanced Encryption Standard (AES) , Public-Key Cryptography : RSA Algorithm , , Authentication : Hash Function , Secure Hash Algorithm (SHA) , Digital Signatures , Firewalls and Packet Filtering , Packet Filtering , Proxy Server	[6]
Unit 6 File Transfer: FTP Commands & Replies, Electronic Mail in the Internet: SMTP, Comparison with HTTP, Mail Message Format, Mail Access Protocols, DNS; The Internet's Directory Service: Services Provided by DNS, Overview of How DNS Works, DNS Records and Messages, Peer-to-Peer Applications: P2P File Distribution, Distributed Hash Tables, Socket Programming: creating Network Applications: Socket Programming with UDP, Socket Programming with TCP.	[6]
Textbooks: 1. James F Kurose and Keith W Ross, Computer Networking, A Top-Down Approach, Sixth edition, Pearson, 2017 . 2. Nader F Mir, Computer and Communication Networks, 2nd Edition, Pearson, 2014. 3. Mayank Dave, Computer Networks, Second edition, Cengage Learning	[6]
Reference Books: 1. Behrouz A Forouzan, Data and Communications and Networking, Fifth Edition, McGraw Hill, Indian Edition 2. Larry L Peterson and Bruce S Davie, Computer Networks, fifth edition, ELSEVIER 3. Andrew S Tanenbaum, Computer Networks, fifth edition, Pearson	[6]





S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III

CS305	ESC	Digital Electronics & Microprocessor	3-0-0	3 Credits
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Teaching Scheme: Lecture: 2 hrs/week Practical: 2hr/week	Examination Scheme: CA1:10 Marks Mid Semester Exam: 30Marks CA2:10 Marks End Semester Exam: 50Marks
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Pre-Requisites: Basic Electronics ,Logic Gate


Course Outcomes: At the end of the course, students will be able to:

CO1	Apply Boolean laws/k map method to reduce given Boolean function
CO2	Design combinational logic circuits.
CO3	Illustrate and implement sequential logic circuits for shift registers, counters
CO4	Apply FSM models to design to building blocks likes sequence detector.
CO5	Illustrate fundamentals of microprocessors.
CO6	Explain instruction sets

Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1	-	-	-	-	-	-	-	-	-	1	1	2
CO2	1	1	2	-	-	-	-	-	-	-	-	-	1	2	1
CO3	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	2	2	2	-	-	-	-	-	-	-	-	-	-	1	-
CO5	2	2	2	-	-	-	-	-	-	-	-	-	-	1	-
CO6	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-




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Course Contents:

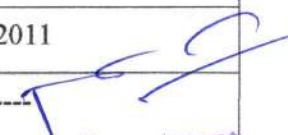
<p>Unit I: Fundamentals of Digital Electronics Number Systems: binary, signed binary, octal, hexadecimal number, binary arithmetic, one's and two's complements arithmetic. Introduction of Boolean algebra, Concept of Min terms-Max terms, SOP-POS forms, Reduction Techniques, K-Map ,K-map with Don't Care Condition</p>	[6]
<p>Unit2 Combinational Circuits Design Combinational Logic : Adder, look ahead carry generator, Sub Tractor, Sub tractor using 1's complement & 2's Complement, BCD Adder, serial adder, ALU, elementary ALU design, Magnitude Comparator, Parity generators/checkers, Code converters, Design of Multiplexers and Demultiplexers, Encoders, Decoders, BCD - to - 7 segment decoder</p>	[6]
<p>Unit 3 Sequential Circuits 1-bit memory cell, latches and Flip-Flops (S-R, D, J-K &T), Use of preset and clear inputs, Excitation 1-table for Flip-Flops, Conversion of Flip-Flops Applications of Flip-Flops: Shift Registers, Counters- 1-Ripple counters, Synchronous Counters, Ring Counters, and Johnson Counter</p>	[6]
<p>Unit 4 Finite State Machine FSM, Representation, Implementation of Moore/Mealy machines, state diagram, state table, state assignment, state reduction, sequence detector.</p>	[6]
<p>Unit 5 Fundamentals of Microprocessor Basic 8085 microprocessor architecture and its functional blocks, 8085 microprocessor IC pin outs and signals., Addressing Modes of 8085.</p>	[6]
<p>Unit 6 Instruction Set & Programming with 8085 Assembly Language Programming Basics ,Instruction set of microprocessor, Instruction timing diagram. Writing Assembling & Executing Assembly Language Programs</p>	[6]

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Fundamentals of Digital Circuits	A. Anand Kumar	PHI	3rd	2008
2	Digital Design	M. Morris Mano	PHI	3rd	2008
4	Modern Digital Electronics	R.P. Jain	Tata McGraw Hill	3rd	2011
5	The INTEL Microprocessors - Architecture , Programming and Interfacing	Barry B. Brey	PHI	7th	

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Design Principles	Wakerly	Pearson	4th	2006
2	Digital Design	Leach, Malvino	TMH	4th	2011
3	Microprocessor Architecture, Programming and Applications with 8085	Ramesh Gaonkar	---	---	---


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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III

CS306	PCC	Python Programming	0-0-2	1 Credit
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Teaching Scheme:	Examination Scheme:
Practical: 2hr/week	CA1:15 CA2:15 ESE:20


Pre-Requisites: None

CO1	Illustrate programming skills in core Python.
CO2	Construct program with looping statements.
CO3	Experiment with list and dictionaries.
CO4	Make use flow control structures and functions
CO5	Examine concept of I/O and exception handling.

Mapping of course outcomes with program outcomes

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




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Course Contents:

Unit1.-Introduction History , Features, Setting up path, Working with Python, Basic Syntax, Variable and Data Types, Operator, Conditional Statements: If , If- else, Nestedif-else.	[4]
Unit 2 Looping: For, While, Nested loops, Control Statements: Break, Continue, Pass, String Manipulation: Accessing Strings , Basic Operations , String slices , Function and Methods.	[4]
Unit3 Lists: Introduction, Accessing list, Operations, Working with lists, Function and Methods,Tuple: Introduction , Accessing tuples, Operations , Working , Functions and Methods.Dictionaries: Accessing values in dictionaries , Working with dictionaries, Properties, Functions.	[5]
Unit4 Flow Controls using Functions: Anonymous functions , Global and local variables, Modules: Importing module , Math module, Random module, Packages, Composition	[5]
Unit5: Input-Output: Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files, Functions, Exception Handling:, Exception, Exception Handling, Except clause, Try ? Finally clause, User Defined Exceptions	[4]
Term Work: Term work based on Practical Performance.	
Text Books: 1. The Complete Reference Python by Martin C. Brown Paperback,Mac graw HillPublications. 2. The core Python Programming,Dr. R Nageshwara Rao ,Dream TechPublication.	

Note:- 8-10 experiments performance is mandatory based on the above syllabus.




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III

CS307	PCC	Data structures and it's Laboratory	0-0-2	1 Credits
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Teaching Scheme:	Examination Scheme:
Practical: 2hr/week	CA1:15 CA2:15 ESE:20

Experiment List:-

S. No.	List of Experiments
1	Write a program for traversing of array. c) To define an integer array of 10 elements and display it. d) To define 2*2 array and display it in matrix form.
2	Write a program to perform operations on an array. c) Insertion of element in array d) Deletion of element from array
3	Write a program to search a number in an array of 10 elements. a) Linear Search b) Binary Search
4	Write C programs for implementing the following sorting methods to arrange a list of integers in ascending order: a) Bubble sort b) Selection sort c) Insertion sort
5	c) Write a program to implement stack operation using array. d) Write a program to implement Infix to Postfix using Stack.
6	c) Write a program to implement linear queue operation using array. d) Write a program to implement Circular queue operation using array.
7	c) Write a program to create singly linked list. d) Write a program to create doubly linked list.
8	Write a program to create binary tree and perform In order, Pre order and PostOrder
9	Write a program to create a graph of n vertices using an adjacency list.
10	Write a program to search an element using hashing techniques.



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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III


CS308	PCC	Computer Networks Laboratory	0-0-2	1 Credits
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Teaching Scheme:	Examination Scheme:
Practical: 2hr/week	CA1:15 CA2:15 ESE:20

Experiment List:-

1. Simulate and Understand IP forwarding within a LAN and across a router.
- 2 Study the working of spanning tree algorithm by varying the priority among the switches.
3. Understand the working of "Connection Establishment" in TCP using a network simulator.
4. Study how the Data Rate of a Wireless LAN (IEEE 802.11b) network varies as the distance between the Access Point and the wireless nodes is varied.
5. Study the working and routing table formation of Interior routing protocols, i.e Routing Information Protocol (RIP) and Open Shortest Path First (OSPF).
6. Plot the characteristic curve throughput versus offered traffic for a Slotted ALOHA system.
7. Understand the impact of bit error rate on packet error and investigate the impact of error of a simple hub based CSMA / CD network.
8. Study the performance of networks based on Star, Bus and Ring topologies
9. TCP/IP Sockets: Using TCP/IP sockets, write a client – server program to make the client send the file name and to make the server send back the contents of the requested file if present.
10. Write a program for calculating the shortest path using Link State Routing Algorithms. Experiments can be done using NS2, NETSIM, NCTU etc.




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III

CS309	ESC	Digital design and microprocessor Laboratory	0-0-2	1 Credits
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Teaching Scheme:	Examination Scheme:
Practical: 2hr/week	CA1:15 CA2:15 ESE:20

Experiment List:-

Sr.No	Name of Experiment
1	Simplification, realization of Boolean expressions using logicgates/universal gates.
2	Realization of half/full adder & half/full subtractors using logic gates
3	Realization of parallel adder/subtractors using 7483 chip, BCD to Excess-3 code conversion & vice versa
4	Realization of binary to gray code conversion & gray code to binary converter.
5	MUX/DEMUX – use of 74153, 74139 for arithmetic circuits & code converter.
6	Realization of one/two bit comparator and study of 7485 magnitude comparator.
7	Use of a) Decoder chip to drive LED display & b) Priority encoder.
8	Truth table verification of flip-flops: i) JK Master Slave ii) T type iii) D type.
9	Addition and subtraction operation using 8085
10	Multiplication and division operation using 8085
11	Block transfer and block exchange using 8085
12	Data conversion using 8085





S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III

MDC02	MC	Environmental Sciences	2-0-0	Audit
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Teaching Scheme:	Examination Scheme:
Lecture: 2 hrs/week	CA1:25 Marks CA2:25 Marks

Pre-Requisites: NA

Course Outcomes: At the end of the course, students will be able to:

CO1	Explain various natural resources and associated Problems
CO2	Summarize various ecosystems
CO3	Explain the importance of conservation of biodiversity and its importance in balancing the earth.
CO4	Recognize various causes of environmental pollution along with various protection acts in India to limit the pollution
CO5	Extract the information based on field study and prepare a report.

Mapping of course outcomes with program outcomes

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





Course Contents:

Unit 1: Nature of Environmental Studies Definition, scope and importance, Multidisciplinary nature of environmental studies. Need for public Awareness.	[2]
Unit 2: Natural Resources and Associated Problems Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems. Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. Energy resources: Growing energy needs, renewable and nonrenewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy. Land resources: Solar energy, Biomass energy, Nuclear energy, Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of individuals in conservation of natural resources.	[6]
Unit 3: Ecosystems Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers. Energy flow in the ecosystem, Ecological succession. Food chain etc. in concern with forest ecosystem, Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chain etc. in concern with Grassland ecosystem Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chain etc. in concern with Desert ecosystem Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chain etc. in concern with various aquatic ecosystems	[4]
Unit 4: Biodiversity Introduction- Definition: genetic, species and ecosystem diversity, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, various approaches for the conservation of biodiversity. And at least one case study in line with this	[4]
Unit 5: Environmental Pollution and Environmental Protection Definition: Causes, effects and control measures of various types of pollution. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution, Concept of sustainable development : From Unsustainable to Sustainable development Various environmental Protection Acts and their scope	[4]
Unit 6: Field Work The student should Visit to a local area to document environmental assets- River/Forest/Grassland/Hill/Mountain. Or Visit to a local polluted site - Urban / Rural / Industrial /Agricultural. Or Study of common plants, insects, birds. or Study of simple ecosystems - ponds, river, hill slopes, etc. The student should expect to do this activity in a group size of 4-5 and prepare and submit a report on it.	[4]



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Text Books:
1. Agarwal, K.C. 2001, Environmental Biology, Nidi Pub. Ltd., Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380013, India, Email: mapin@icenet.net (R)
3. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
4. Clank R.S. Marine Pollution, Clarendon Press Oxford (TB)
5. Cunningham, W.P. Cooper, T.H. Gorhani, E. & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Pub. Mumbai, 1196p
6. De A.K., Environmental Chemistry, Wiley Western Ltd.
7. Down to Earth, Centre for Science and Environment, New Delhi. (R)
8. Gleick, H., 1993, Water in crisis, Pacific Institute for studies in Dev., Environment & Security. Stockholm Env. Institute. Oxford Univ. Press 473p
9. Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H. & Watson, R.T. 1995, Global Biodiversity Assessment, Cambridge Univ. Press 1140p.
11. Jadhav, H. and Bhosale, V.M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Delhi 284p.
12. Mickinney, M.L. and School. R.M. 1196, Environmental Science Systems and Solutions, Web enhanced edition, 639p.
13. Miller T.G. Jr., Environmental Science. Wadsworth Publications Co. (TB).
14. Odum, E.P. 1971, Fundamentals of Ecology, W.B. Saunders Co. USA, 574p.
15. Rao M.N. and Datta, A.K. 1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd., 345p
16. Sharma B.K., 2001, Environmental Chemistry, Gokel Publ. Hkouse, Meerut
17. Survey of the Environment, The Hindu (M)
18. Townsend C., Harper, J. and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
19. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, vol. I and II, Environmental Media (R)



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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III

Aptitude Skill -I

HMS01	HSMC	Aptitude Skills- I	1-0-0	1 credit
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Teaching Scheme: Lecture: 1 hrs/week Tutorial: NA Practical: NA	Examination Scheme: CA1=25 marks CA2-25 marks
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Pre-Requisites: Communication Skills

Group A

Aptitude (12Hrs)(Compulsory)

Course Objectives:-

1	To study multiplications, squares, square roots, cubes and cube roots to solve aptitude problems
2	To understand the concepts of Number system
3	To study the basics of aptitude skills like percentage, average, ratio and proportion,
4	To study the various speed, time and distance basic concepts
5	To understand the concepts of business aptitude
6	To understand the Concepts of Geometry and Venn diagram in Aptitude


Course Outcomes: At the end of the course, students will be able to:

1	Understand speed math techniques to solve aptitude problems
2	Summarize number systems in detail
3	Explain basic aptitude techniques related to Percentage, Average, Ratio Proportion and Fraction
4	Understand speed, time and distance concepts
5	Summarize the concepts of Business aptitude using basic aptitude
6	Solve the aptitude problems on Geometry and Venn Diagram

Mapping of course outcomes with program outcomes:

Course Outcomes	Program Outcomes													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2													2
CO2	2													2
CO3	1					1								2
CO4	2													2
CO5						1	1		2					2
CO6						1	1		2					2




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Course Contents:

Unit 1: Speed Math Techniques Multiplication, Squares, Square roots, Cubes, Cube roots	[1]
Unit 2: Number System Types of Number System, Last Digit Method, BODMAS Calculation, HCF and LCM, Progressions	[2]
Unit 3: Basic Aptitude Percentage, Average, Ratio and Proportion, Fraction, Partnership	[3]
Unit 4: Speed- Time- Distance Speed, Time, and Distance, Trains, Boats, Streams, Races	[2]
Unit 5: Business Aptitude Profit & Loss, Simple Interest, Compound Interest	[2]
Unit 6: Geometry and Venn Diagram 2D and 3D Mensuration, Venn diagram	[2]
Text Books: <ol style="list-style-type: none">1. Arun Shrama - Quantitative aptitude for CAT.2. RS Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning, S. Chand Publisher; 2016 edition3. RS Aggarwal, Quantitative Aptitude for Competitive Examinations, S. Chand Publisher; 2016 edition	
Reference Books: <ol style="list-style-type: none">1. Fast Track Objective Arithmetic Paperback, by Rajesh Verma – 20182. Teach Yourself Quantitative Aptitude, Arun Sharma3. The Pearson Guide To Quantitative Aptitude For Competitive Examination by Dinesh Khattar	




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III

Language Skill- I

HMS02	HSMC	Language Skill- I	0-0-2	Audit
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Teaching Scheme: Lecture: NA Tutorial: NA Practical: 2 hrs/week	Examination Scheme: CA1=25 marks CA2-25 marks
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Pre-Requisites: Communication Skills

Languages (Any One)

C Programming (Technical Language) (24Hrs)

C Programming

Course Objectives:

This course provides an opportunity to enhance acquisition of the fundamental elements of the C programming language. Emphasis is on the progressive development of basic programming syntaxes and essentials used in C programming

Course Outcomes: At the end of the course, students will be able to:

1	Explain fundamentals & essentials of C programming.
2	Illustrate Types, Operators and Expressions.
3	Make use of Decision Making and Looping Statements
4	Make use of Arrays in C programming.

Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	0	0	0	0	0	1	1	1	0	1	1	1
CO2	1	1	0	0	0	0	0	1	1	1	0	1	1	1
CO3	1	2	2	1	0	0	0	1	1	1	0	1	1	2
CO4	1	2	2	1	0	0	0	1	1	1	0	1	1	2




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Course Contents:-

Unit 1: Basics of C Editing, Compiling, Error Checking, executing, testing and debugging of Programs, Flowcharts, Algorithms, Structure of C Program.	[6]
Unit 2: Types, Operators and Expressions Variable names, Data types, sizes, constants, declarations, arithmetic operators, relational and logical operators, type conversions, increment and decrement operators, bitwise operators, assignment operators and expressions, conditional expressions precedence and order of evaluation.	[6]
Unit 3: Decision Making and Looping Statements Statements and Blocks. If-else, else-if switch Loops while and for, do-while break and continue go to and Labels	[6]
Unit 4: Arrays Initializing arrays, Initializing character arrays ,two dimensional and multidimensional arrays.	[6]
Text Books: <ol style="list-style-type: none">1. C Programming Absolute Beginner's Guide, Que Publishing; 3rd edition (22 August 2013)2. C Programming Language 2nd Edition, Pearson Publication	
Reference Books: <ol style="list-style-type: none">1. C: The Complete Reference, McGraw Hill Education; 4th edition (1 July 2017)2. C Programming in easy steps, 5th Edition, In Easy Steps Limited3. The C Programming Language, Second Edition, By Pearson Education India (1 January 2015)	




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Japanese Language Course I (24Hrs)

Course Objectives:

This course is designed to introduce students to the everyday language of Japan. Lessons will be organized around natural conversational topics, leading students from fundamental aspects of grammar to readings in simple texts.


Course Outcomes: At the end of the course, students will be able to:

1	Explain the history and scripts used in Japanese
2	Translate simple English words into Japanese
3	Express themselves by using simple sentences and responses to questions.
4	Demonstrate Japanese scripts through oral and written communication.

Mapping of course outcomes with program outcomes

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




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Course Contents:-

Unit 1: Introduction Brief history of Japan, Japanese Language, Introduction of three scripts in Japanese, viz. Hiragana, Katakana, and Kanji, Days of the week, Basic Numerals, and months of the year,	[6]
Unit 2: Simple Word forming Demonstratives in Japanese, Writing simple words in Hiragana, Writing all types of words, and simple sentences in Hiragana, Verbs in Japanese,	[6]
Unit 3: Simple sentence forming Introduction of Katakana, Formation of simple sentences involving asking and answering questions, Basic Conversational skills. Asking and answering questions based on the topics studied, Introduction of few simple Kanji, and their use in sentences based on the pattern “---ni--- gaarimasu”.	[6]
Unit 4: Simple interactions Translations from, and into Japanese, Reading an unseen paragraph, and answering questions based thereon, General Revision	[6]
Text Book: <ol style="list-style-type: none">1. Nihongo Shoho I (Japan Foundation Publ.)2. GENKI I: An Integrated Course in Elementary Japanese (English and Japanese Edition)3. Japanese for Busy People I: Kana Version (Japanese for Busy People Series) 3rd Edition	
Reference Book: <ol style="list-style-type: none">1. Minna No Nihongo I (3A Corporation, Japan)2. Japanese from Zero! 1: Proven Techniques to Learn Japanese for Students and Professionals 6th Edition by George Trombl	




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Foreign Languages (Any One)

German Language Course I (24Hrs)

Course Objectives:

This course provides an opportunity to enhance acquisition of the fundamental elements of the German language. Emphasis is on the progressive development of basic listening, speaking, reading, and writing skills through the use of supplementary learning media and materials.

Course Outcomes: At the end of the course, students will be able to:

1	Summarize the simple German words used for daily used words
2	Translate simple English words into German
3	Express themselves by using simple sentences and responses to questions.
4	Demonstrate German scripts through oral and written communication.

Mapping of course outcomes with program outcomes

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



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Course Contents:-

Unit 1: Introduction Introduction of the language, Greetings, Introduce oneself, speaking about yourself and others, numbers, E-mail address, Alphabets, speaking about countries and languages, Speaking about Hobbies, to have an informal appointment, learning weekdays, months and seasons.	[6]
Unit 2: Simple Word forming Speaking about professions, work and wartimes, learning to fill up a profile in German, Learning to name the famous places, buildings in a city, learning definite/ indefinite and negative articles in German, to name the modes of transportation, To learn to describe the way, to understand the texts with international words.	[6]
Unit 3: Simple sentence forming To speak about food, to plan a shopping, conversation with the shopkeeper, Conversation about the food, about likes and dislikes, to understand the "w" questions, To understand the watch timings, giving information about time, speaking about the families, to plan a date	[6]
Unit 4: Simple interactions Learning about punctuality in Germany and how to excuse for delay, telephonic conversation about the appointments, To plan something together, speaking about birthday, to understand invitation and to write an invitation, to order and to pay in restaurant, to speak about own experiences, To understand particular information from the texts, to understand about different events and events related information in Radio	[6]
Text Books <ol style="list-style-type: none">1. Netzwerk Arbetisbuch A1 Goyal Publisher.2. "The Everything Learning German Book: Speak, Write and Understand Basic German in No Time" by EdSwick3. "German Made Simple: Learn to Speak and Understand German Quickly and Easily"	
Reference Books <ol style="list-style-type: none">1. by Eugene Jackson and Adolph Geiger2. "Hammer's German Grammar and Usage" (Fifth Edition) by Professor Martin Durrell3. "Learn German with Stories: Café in Berlin" by André Klein	




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester III

PRJ02	PROJ	Mini Project-II	0-0-2	Audit
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Teaching Scheme:	Examination & Evaluation Scheme:
Practical: 2hr/week	Seminar and Presentation CA1:-25 CA2:-25

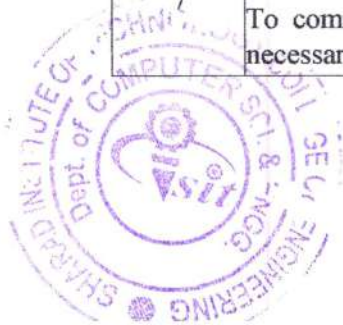
Pre-Requisites: Basic knowledge of Communication skills and Computer programming.

Course Objectives:: At the end of the course, students will be able to:

Course Objectives:	
The course aims to :	
1	Up skill and reskill student workforce
2	Analyzing data to make predictions
3	Gain access to fresh ideas, new technologies and solutions
4	Exploring new technologies
5	Rewarding innovative thinking
6	Out-Of-The-Box Solutions

Course Outcomes:

Course Outcomes: Upon successful completion of this course, the students will be able to:	
1	Identify the problems related with technical, social importance.
2	To convert open ended problem statements into statement of work
3	To identify the literature gap with the help of available literature and survey
4	Analyse the problem using engineering knowledge obtained
5	Solve the engineering problems using systematic approach
6	Collaborate with the team members with different background to achieve the solution
7	To communicate effectively the process followed, readings and observations by producing necessary documents



[Signature]
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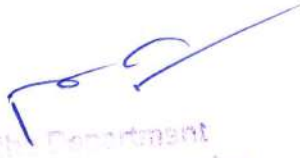
An engineering graduate must pay attention to societal concerns to alleviate some of the real-life societal challenges by delivering reasonable technology solutions. The mini project concept is based on the same theme. The mini project attempts to discover societal problems and develop answers utilizing science and technology for the betterment of society or human life. This will assist students in understanding the product/project development process, best practices and encouraging their creativity to tackle real-world problems. While developing the application/product, students will learn effective team building, designing, budgeting, planning, engineering skills and processes, and safety norms and standards. Students will recognize the need for documentation and professional ethics.

Guidelines

1. Every student shall undertake the Minor Project in semester III and continue for semester IV.
2. A group of a minimum of 3 and a maximum of 5 students shall be allotted for each mini project.
3. The students have to identify the problem by a discussion with various stakeholders, site visits, expert opinions and various research articles in consultation with the project guide.
4. Collect sufficient data and survey to establish the criticality of the problem to be solved.
5. Apply various tools for project planning and design.
6. Critically analyze various solutions/techniques to solve real-world problems.
7. Select and justify one of the solutions identified based on the feasibility, affordability, ease of use and environmental concern.
8. Learn and apply standards of engineering ethics and professional behavior.

The committee of senior faculty members and a guide will be appointed to monitor the progress and continuous evaluation of each project. The assessment shall be done jointly by the guide and committee members.




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Department: Computer Science & Engineering
 Class: S.Y.B.Tech

Rev: CSE Course Structure/00/2020-21
 Semester: IV

Sr No	Course Code	Course Type	Course	Teaching Scheme				Evaluation Scheme					Credits
				L	T	P	Total Hrs.	CA1	CA2	MSE	ESE	Total	
1	CS401	BSC	Probability & Statistics	3	-	-	3	10	10	30	50	100	3
2	CS402	PCC	Theory of Computation	3	-	-	3	10	10	30	50	100	3
3	CS403	PCC	Operating System	3	-	-	3	10	10	30	50	100	3
4	CS404	PCC	Database Management System	3	-	-	3	10	10	30	50	100	3
5	CS405	PEC	Elective-I	3	-	-	3	10	10	30	50	100	3
6	CS406	PCC	Operating System Laboratory	-	-	2	2	15	15	-	20	50	1
7	CS407	PCC	Database Management System Laboratory	-	-	2	2	15	15	-	20	50	1
8	CS408	PEC	Elective-I Laboratory	-	-	2	2	15	15	-	20	50	1
9	PRJ03	PROJ	Mini Project-III	-	-	2	2	25	25	-	-	50	1
10	MDC01	MC	Constitution of India	1	-	-	1	25	25	-	-	50	Audit
11	HMS03	HSMC	Aptitude Skills-II	1	-	-	1	25	25	-	-	50	Audit
12	HMS04	HSMC	Language Skills-II	-	-	2	2	25	25	-	-	50	1
13	IFT01	PROJ	Industrial Training/Field Training-I.	-	-	-	-	-	-	-	50	50	Audit
Total				17	0	10	27	160	150	150	330	800	20




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

CS401	BSC	Probability and Statistics	3-0-0	3 Credits
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Teaching Scheme	Examination Scheme
Lecture: 3 hrs/week	CA I:10 Marks CA II:10 Marks Mid Semester Exam: 30Marks End Semester Exam: 50Marks

Pre-Requisites: 11th, 12th Std.


Course Outcomes: At the end of the course, students will be able to:

CO1	Apply the concepts of probability to solve engineering problems.
CO2	Illustrate and formulate fundamental probability distribution and density functions, as well as functions of random variable.
CO3	Apply different methods to find the correlation between the variable.
CO4	Develop basic mathematical tools for regression analysis.
CO5	Develop basic mathematical tools for fitting of curves like linear and non-linear curve.
CO6	Develop basic mathematical tools for Queening theory.

Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	-	-	1	-	-	-	1	-	-	-
CO2	2	2	-	-	1	-	-	1	-	-	-	1	-	-	-
CO3	2	2	-	-	1	-	-	1	-	-	-	1	-	-	-
CO4	2	2	-	-	1	-	-	1	-	-	-	1	-	-	-
CO5	2	2	-	-	1	-	-	1	-	-	-	1	-	-	-
CO6	2	2	-	-	-	-	-	1	-	-	-	1	-	-	-




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Course Contents:

Unit 1: Basic Probability Definition and concept of probability: Addition theorem of probability Multiplication theorem of probability (Without proofs), Examples. Random variables, Probability distributions, Probability mass function, Probability density function, Mathematical expectation, Join and marginal probability distributions, Properties of expectation and variance with proofs.	[7]
Unit 2: Theoretical Probability Distributions Binomial distribution, Poisson distribution, Normal distribution, Fitting of binomial distributions, Properties of binomial, Poisson and normal distributions, Relation between binomial and normal distributions, Relation between Poisson and normal distributions, Importance of normal distribution, Examples.	[7]
Unit3: Correlation Introduction, Types of correlation, Correlation and causation, Methods of studying correlation, Karl Pearson's correlation coefficient, Spearman's rank correlation, Coefficient, Properties of Karl Pearson's correlation coefficient and Spearman's rank correlation coefficient, Probable errors.	[6]
Unit 4: Linear Regression Analysis Introduction, Linear and non-linear regression, Lines of regression, Derivation of regression lines of y on x and x on y, Coefficients of regression, Properties of regression coefficient.	[6]
Unit5: Applied Statistics Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and Exponential curves. Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means, and difference of standard deviations.	[7]
Unit6: Queuing Theory Introduction, Queuing systems, The input or arrival pattern, The service pattern and service discipline, Notation, Performance measures, Little's formula, Relation between the probabilities of states, M/M/1/∞ systems, Examples.	[7]
Reference/Text books:- <ul style="list-style-type: none">• I. Kishor S. Trivedi, Probability, Statistics with Reliability, Queuing and Computer Science Applications, Wiley India Pvt. Ltd, 2nd Edition, 2001.• Vijay K. Rohatgi, A. K. Md. Ehsanes Saleh, An	




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Introduction To Probability And Statistics, Wiley
Publication, 2nd Edition, 2001.

- **S. C. Gupta**, Fundamentals of Statistics, Himalaya Publishing House, 7th Revised and Enlarged Edition, 2016.
- **G. V. Kumbhojkar**, Probability and Random Processes, C. Jamnadas and Co., 14th Edition, 2010.




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

CS402	PCC	Theory of Computation	3-0-0	3 Credits
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Teaching Scheme	Examination Scheme
Lecture: 3 hrs/week	CA-I: 10 Marks CA-II: 10 Marks Mid Semester Exam: 30 Marks End Semester Exam: 50 Marks

Pre-Requisites: Basic Logic, Set, Graph related concepts.

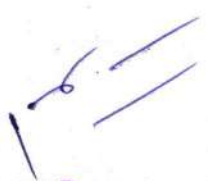
Course Outcomes: At the end of the course, students will be able to:

CO1	Apply concepts of FA and formal language
CO2	Illustrate grammars and CFG
CO3	Explain concepts of CFL and parsing
CO4	Make use of push down automata
CO5	Construct a various Turing machine on given problem

Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	2	-	-	-	-	-	-	-	-	-	1	2	-	-
CO2	2	2	-	-	-	-	-	-	-	-	-	1	2	-	-
CO3	2	2	-	-	-	-	-	-	-	-	-	1	2	-	-
CO4	2	2	-	-	-	-	-	-	-	-	-	1	2	-	-
CO5	2	2	-	-	-	-	-	-	-	-	-	2	2	-	-




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Course Contents:

Unit 1: Regular Language and Finite Automata: Regular expressions and corresponding regular languages, Definition of deterministic finite automata, Moore and Mealy machines, Recursive definition, Non-deterministic finite automata, NFA with ϵ -moves, Inter-conversion between NFA and DFA, Kleen's Theorem, Pumping lemma.	[6]
Unit 2: Grammar and Context Free Grammars: Definition & types of grammars & languages, Production rules, Ambiguous grammar, Removal of ambiguity, Chomsky hierarchy, Context Free Grammar (CFG) – definition, Simplification of CFG.	[6]
Unit 3: Context Free Languages: Definition of context free languages, Regular grammar definition, Left linear, Right linear grammar, CNF, GNF, Parsing-Top-Down, Recursive Descent and Bottom-Up Parsing, Pumping Lemma and examples, intersections and complements	[6]
Unit 4: Pushdown Automata: Formal definition, Push-down automata (PDA), Deterministic Pushdown automata (DPDA) – definition, Non-deterministic Pushdown automata (NPDA), Equivalence of CFG's & PDA's.	[6]
Unit 5: Turing Machines and Undesirability: Definition, Computing with Turing machine, combining Turing Machines, Computing a function with a TM, Non-deterministic Turing machines, The Church's Turing hypothesis, Universal Turing machines, The Halting problem, Unsolvable problems about Turing machines.	[6]
Text Books: 1. John C. Martin, <i>Introduction to Languages and Theory of Computation</i> , McGraw-Hill Publication, 4th Edition, 2010 2. Daniel I. A. Cohen, <i>Introduction to Computer Theory</i> , Wiley Publication, 1st Edition, 1986.	
Reference Books: 1. Hopcroft, Ullman, Motwani, <i>Introduction to Automata Theory, Languages, and Computation</i> , Addison Wesley Publication, 2nd Edition, 2001. 2. <i>Introduction to Automata Theory, Languages and computation</i> —John E. Hopcraft, Rajeev Motwani, Jeffrey D. Ullman (Pearson Edition). Chapters 1, 3, 4, 5. 3. <i>Introduction to theory of Computations</i> —Michael Sipser (Thomson Books/Cole) Chapters 6, 7, 8. 4. E. V. Krishnamurthy, <i>Introductory Theory of Computer Science</i> , Springer-Veleng New York Inc., 1st Edition, 1985.	





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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

CS403	PCC	Operating System	3-0-0	3 Credits
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Teaching Scheme	Examination Scheme
Lecture: 3 hrs/week	CA-I: 10 Marks CA-II: 10 Marks Mid Semester Exam: 30 Marks End Semester Exam: 50 Marks

Pre-Requisites: None.

Course Outcomes: At the end of the course, students will be able to:

CO1	Explain the basic concept of operating system & their types.
CO2	Illustrate the flow of process with its states and different process scheduling policies.
CO3	Explain concepts of Mutual exclusion and IPC
CO4	Make use the concept of deadlocks
CO5	Illustrate concept of memory management policies.
CO6	Illustrate the concepts of Unix and Linux OS.

Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	1	2	-	-	-	-	-	-	2	2	2	2
CO2	2	2	2	1	2	-	-	-	-	-	-	2	2	2	2
CO3	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2
CO4	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2
CO5	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2
CO6	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2



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Course Contents:

Unit 1:- Introduction Basics of Operating Systems: Definition – Generations of Operating systems – Types of Operating Systems, OS Service, System Calls, OS structure: Layered, Monolithic, Microkernel Operating Systems – Concept of Virtual Machine	[3]
Unit 2:- Process Management Processes: Definition , Process Relationship , Process states , Process State transitions , Process Control Block ,Context switching – Threads – Concept of multithreads , Benefits of threads – Types of threads Process Scheduling: Definition , Scheduling objectives ,Types of Schedulers,Scheduling criteria : CPU utilization, Throughput, Turnaround Time, Waiting Time, ResponseTime (Definition only) Scheduling algorithms : Pre emptive and Non , pre emptive , FCFS – SJF– RR , Multiprocessor scheduling : Types , Performance evaluation of the scheduling.	[7]
Unit 3:- Interprocess Communication Race Conditions, Critical Section, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, and Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem etc., Scheduling, Scheduling Algorithms.	[4]
Unit4:- Deadlocks Definition, Deadlock characteristics, Deadlock Prevention, Deadlock Avoidance: banker's algorithm, Deadlock detection and Recovery.	(3) [3]
Unit 5:- Memory Management Basic Memory Management: Definition, Logical and Physical address map, Memory allocation: Contiguous Memory allocation – Fixed and variable partition – Internal and External fragmentation and Compaction, Paging: Principle of operation – Page allocation – Hardware support for paging –, Protection and sharing – Disadvantages of paging. Virtual Memory: Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault , Working Set , Dirty page/Dirty bit – Demand paging (Concepts only) – Page Replacement policies : Optimal (OPT) , First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recently used (LRU)	[7]



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Unit 6:- Unix/Linux Operating System	[3]
Development of Unix/Linux, Role & Function Of Kernel, System Calls, Elementary Linux command & Shell Programming, Directory Structure, System Administration Case study: Linux, Windows Operating System	
Text Books/ Reference Books: <ol style="list-style-type: none">1. Russell, Norvig, Artificial Intelligence: A Modern Approach, Third edition, Prentice Hall, 20102. Hastie, Tibshirani, Friedman. The elements of statistical learning, Second edition, Springer, 20093. Tsang. Foundations of constraint satisfaction, Academic press, 19934. Daphne Koller and Friedman. Probabilistic Graphical Models- Principles and Techniques, The MIT Press, 2009	
Reference Books: <ol style="list-style-type: none">1. Tom Adelstein and Bill Lubanovic, Linux System Administration, O'Reilly Media, ISBN-10: 0596009526, ISBN-13: 978-05960095262. Harvey M. Deitel, Operating Systems, Prentice Hall, ISBN-10: 0131828274, ISBN-13: 978-01318282783. Thomas W. Doeppner, Operating System in depth: Design and Programming, WILEY, ISBN: 978-0-471-68723-84. Mendel Cooper, Advanced Shell Scripting, Linux Documentation Project.5. Operating Systems by D.M. Dhamdhere, Tata McGraw Hill 2nd edition.6. Unix Shell Programming – by Yashwant Kanetkar, BPB publications.	

Term Work:

1. Hands on UNIX commands.
2. Shell programming for file handling.
3. Shell script programming using the commands grep, awk and sed.
4. Implementation of different scheduling algorithms.
5. Implementation of various page replacement policies.
6. Implementation of synchronization primitives- semaphores, locks and conditional variables.
7. Implementation of various memory allocation algorithms.



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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

CS404	PCC	Database Management systems	3-0-0	3Credits
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Teaching Scheme	Examination Scheme
Lecture: 3 hrs/week	CA-I: 10 Marks CA-II: 10 Marks Mid Semester Exam: 30 Marks End Semester Exam: 50 Marks

Pre-Requisites: -

Course Outcomes: At the end of the course, students will be able to:

CO1	Explain the basic database concepts of DBMS, applications, data models, schemas and instances.
CO2	Demonstrate the use of constraints and relational algebra operations for building applications
CO3	Make use of the basics of SQL and construct queries using SQL in database creation and interaction.
CO4	Construct different normalization techniques in databases.
CO5	Illustrate concepts of indexing and hashing
CO6	Choose different strategies for providing security, privacy, control, backup and recovery of data.

Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	1	1	1	-	-	-	-	-	-	-	-	1	-	1
CO2	2	1	2	1	-	-	-	-	-	-	-	-	-	1	-
CO3	1	1	2	-	-	-	-	-	-	-	-	-	1	-	-
CO4	1	2	2	1	-	-	-	-	-	-	-	-	-	2	-
CO5	2	2	1	-	-	-	-	-	-	-	-	-	-	2	1
CO6	2	2	1	-	-	-	-	-	-	-	-	-	-	2	1



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Course Contents:

1.Introduction Concept & Overview of DBMS, Data Models, Database Languages, Database Administrator, Database Users, Three Schema architecture of DBMS ,View of Data, Data Models, Database Architecture, , The Entity-Relationship Model-Constraints, keys, E-R Diagrams. Weak Entity Sets, Extended E-R features.	[6]
2.Relational Model Structure of relational Databases, Database Schemas, Relational Algebra, Relational Calculus,Extended Relational Algebra Operations. Calculus vs Algebra.	[6]
3.Introduction to SQL SQL Data Definition Language, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Sub queries, Modification of the Database, Join Expressions, Views, Integrity Constraints, and Accessing SQL from a Programming triggers.	[6]
4.Relational Database Design The purposes of Normalization, Data Redundancies and Update Anomalies, Functional Dependencies- types of functional dependency, closure of set of functional dependency, canonical cover, The Process of Normalization, First Normal Form, Second Normal Form, Third Normal Form, Boyce-Codd Normal Form, Fourth Normal Form, Fifth Normal Form.	[6]
5.File Organization Indexing and Hashing Overview of File Organization, Organization of Records in Files, Data-Dictionary Storage, Database Buffer. Basic Concepts of Indexing and Hashing, Ordered Indices, B+-Tree Index Files, B-Tree IndexFiles, Multiple-Key Access, Static Hashing, Query Processing-Overview, and Measures of Query cost, Evaluation of relational algebra operations, Query optimization.	[6]
6.Transaction management and Concurrency control Transaction concept, A simple transaction model, ACID properties, serializability and	[6]



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concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping model, Recovery systems-Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, checkpoint, Shadow paging.	
<p>Text Books:-</p> <p>1 "Database System Concepts", Abraham Silberschatz, Henry F. Korth, S. Sudarshan, 6th edition, McGraw- Hill. 2 "Database Systems - A Practical Approach to Design, Implementation and Management", Thomas Connolly, Carolyn Begg, 4th Edition, Addison Wesley. 3 "MySQL Cookbook", Paul DuBois, 3rd edition, O'REILLY.</p> <p>Reference Books:-</p> <p>1 "Fundamentals of Database Systems", Ramez, Elmasri, Shamkant B. Navathe, 6th Edition, Addison Wesley. 2 "Database Systems – Design, Implementation and Management", Rob & Coronel, 5th Edition, Thomson Course Technology.</p>	

Term Work:

The term work includes Practical Performance & Write up of Experiment.




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV
Elective-I

CS405A	PEC	OOPS using .NET	3-0-0	3 Credits
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Teaching Scheme	Examination Scheme
Lecture: 3 hrs/week	CA-I: 10 Marks CA-II: 10 Marks Mid Semester Exam: 30 Marks End Semester Exam: 50 Marks

Pre-Requisites: Object oriented programming


Course Outcomes: At the end of the course, students will be able to:

CO1	Explain basics .net and C# concept
CO2	Summaries OOP's concept.
CO3	Make use of flow control statement, exception handling and threading
CO4	Experiment with standard I/O Stream.
CO5	Construct windows form using basic controls, panels, layouts.
CO6	Create database programming using ADO.NET and perform select, insert, delete, update operations.

Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	1	1	2	1	-	-	-	-	-	-	1	2	2	2
CO2	2	2	2	1	1	-	-	-	-	-	-	1	2	2	2
CO3	2	2	2	1	1	-	-	-	-	-	-	1	2	2	2
CO4	2	2	2	2	1	-	-	-	-	-	-	1	2	2	2
CO5	2	2	2	2	1	-	-	-	-	-	-	1	2	2	2
CO6	2	2	2	2	1	-	-	-	-	-	-	1	2	2	2




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Course Contents:

Unit 1 NET Architecture The Relationship of C# to .NET, The Common Language Runtime, A Closer Look at Intermediate Language, Assemblies, .NET Framework Classes, Namespaces C# Basics Variables, Predefined Data Types, Flow Control, Enumerations, Arrays, Namespaces, The Main () Method, More on Compiling C# Files, Console I/O, Using Comments# Programming Guidelines, Dynamic variables, DLL creation & calling.	[3]
Unit 2 Objects and Types Classes and Structs, Class Members, Anonymous Types, Strcuts, Partial Classes, Static Classes, The Object Class, Extension Methods	[3]
Unit3 Inheritance Types of Inheritance, Implementation Inheritance, Modifiers, Interfaces	[2]
Unit4 Arrays Simple Arrays, Multidimensional Arrays, Jagged Arrays, Array Class, Array and Collection Interfaces, Enumerations	[2]
Unit 5 Operators and Casts Operators, Type Safety, Comparing Objects for Equality, Operator Overloading, User Defined Casts	[2]
Unit 6 Windows Form & Database with ADO.NET Introduction to GUI application & components –add data control programmatically, Link data to control, process all control, track the visible forms, Find all MDI child forms, Save configuration setting for form, Force list box to scroll items, Restrict text box, Use of auto complete combo box ,Sort a list view, Database with ADO.NET-Overview of Ado.NET, Data components in Visual Studio .NET.	[4]
Unit 7 Strings System. String, Building Strings, String Builder Members, Format Strings, Regular Expressions	[7]
Unit8 Threading Overview, Asynchronous Delegates, the Thread Class and Thread Pools,	[1]



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Threading Issues, Synchronization ,Timers	
Unit9 Networking Networking-Obtain information about Local network, Detect changes in network, Download data over HTTP or FTP, Download a File & Process using Stream, Respond to HTTP request from your application	[2]
Reference Books: 1. Professional C# 2012 & .Net 4.5 (For Unit 1 to 6 & Unit 8 to 9) – Christian Nagel,Bill Evjen, Jay Glynn, Morgan Skinner, Karli Watson, Wrox Publication. 2.A Programmer's Guide to ADO.Net in C# (For Unit 7 database with ADO.NET) - Mahaesh Chand, ApressPublication. 3.A Programmer's Guide to ADO.Net in C# (For Unit 7 database with ADO.NET) - Mahaesh Chand, ApressPublication.	




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

Elective-I

CS405B	PEC	OOPS using Java	3-0-0	3 Credits
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Teaching Scheme	Examination Scheme
Lecture: 3 hrs/week	CA-I: 10 Marks CA-II: 10 Marks Mid Semester Exam: 30 Marks End Semester Exam: 50 Marks

Pre-Requisites: Structured Programming Approach

Course Outcomes: At the end of the course, students will be able to:

CO1	Outline basic concepts of object oriented programming
CO2	Illustrate the concept of packages, classes and objects.
CO3	Elaborate the concept of strings, arrays and vectors.
CO4	Implement the concept of inheritance and interfaces.
CO5	Implement the notion of exception handling and multithreading.
CO6	Develop GUI based application




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Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	2	1	1	2	2	1	1	2	-	-	1	2	2	2
CO2	2	2	1	1	2	2	1	1	2	-	-	1	2	1	1
CO3	2	2	1	1	2	2	1	2	2	-	-	1	2	2	2
CO4	2	2	1	1	2	2	1	2	2	-	-	1	2	1	1
CO5	2	2	1	1	2	2	1	1	2	-	-	1	2	2	2
CO6	2	2	1	1	2	2	1	2	2	-	-	1	2	1	1

Course Contents:

<p>Unit 1: Basic Syntactical Constructs In Java</p> <p>Java features and java programming environment define class; create object and accessing members, java tokens, data types, constants. Variables dynamic initialization array string type casting etc. Operators, expression Operator precedence, evaluation of expression, mathematical functions. Decision making and looping – If, If-Else, nested If-Else. Switch case Conditional operator, While loop, do-while loop, for loop, Continue, return keywords, nesting loops.</p>	[6]
<p>Unit 2: Derived Syntactical Construct In Java</p> <p>Constructors and Methods, Types of constructors, Nesting of Methods, This keyword, command line argument. Garbage collection, finalize () method, object Class .Visibility control –private, public and protected. Friendly private protected access, default, Examples of visibility control, Arrays and Strings – types of arrays, String classes and string buffers. Vectors, Wrapper classes and enumerated types</p>	[6]
<p>Unit 3: Inheritance, Interface And Package</p> <p>Inheritance and its types, Types of inheritance Operator overloading and operator overriding Dynamic method dispatch. Final variable and method Using super abstract methods and classes, static members Interfaces –define, implement, and access. Nested interfaces and examples Define package types of package naming and creating packages, accessing packages. Import statement, static import, adding class and interface to package.</p>	[6]



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<p>Unit 4: Exception Handling and Multithreading</p> <p>Errors and Exception, types of errors Try, catch, nested try catch Throws, finally statement, build-in exception , creating own exception Examples of exception handling ,Multithreaded programming – Creating threads – using extending thread class and runnable interface, Thread life cycle – wait(),notify(),sleep(),suspend(),stop(). Thread exceptions, thread priority, methods Thread synchronization, thread communication, deadlock</p>	[6]
<p>Unit 5: Managing Input Output Files In Java</p> <p>Introduction and concept of stream, stream classes, Byte stream classes, input stream classes, output stream classes. Examples of file handling using stream classes Character stream classes Using File IO Class: IO exceptions, creation of files, reading and writing files Handling primitive data types Examples of handling primitive data types</p>	[6]
<p>Unit 6: Graphics in Java</p> <p>Introduction to applet-Applet, Applet Life Cycle. Example of Applet life cycle, html parameters and embedding Applet Graphics Programming – Classes, Line, Examples of graphic programming using Rectangles, circles, Examples of graphic programming using , arcs, polygons. Colors and Fonts- Examples of color settings-setcolor(), getcolor(), setforeground() etc. Font Class- variables, methods, graphics class environment, Examples of graphic programming using Font methods.</p>	[6]
<p>Text books:</p> <p>1. Herbert Schildt, JAVA: The Complete Reference", Ninth Edition, OraclePress.</p> <p>Reference Books:</p> <p>1 Ivor Horton, Beginning JAVA, WileyIndia.</p> <p>2 DietalandDietal, Java: How to Program,8/e,PHI</p> <p>3 JAVA Programming, Black Book, DreamtechPress.</p> <p>4 Learn to Master Java programming,Staredusolutions</p>	



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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV
Elective-I

CS405C	PEC	OOPS using C++	3-0-0	3 Credits
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Teaching Scheme	Examination Scheme
Lecture: 3 hrs/week	CA-I: 10 Marks CA-II: 10 Marks Mid Semester Exam: 30 Marks End Semester Exam: 50 Marks

Pre-Requisites: C Programming.

Course Outcomes: At the end of the course, students will be able to:

CO1	Illustrate Basics of OOP.
CO2	Experiment with classes and objects.
CO3	Implement Inheritance in C++ program
CO4	Make use of Polymorphism in C++ program
CO5	Develop C++ programs to perform file operations.

Mapping of Course Outcome with Program Outcome

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	2	1	1	1	-	-	-	-	-	-	-	2	1	1	-
CO 2	2	1	2	1	-	-	-	-	-	-	-	2	1	1	1
CO 3	1	1	1	1	-	1	-	-	-	-	-	2	-	1	1
CO 4	2	1	2	2	-	1	-	-	-	-	-	1	1	-	-
CO 5	2	2	2	1	-	1	-	-	-	-	-	2	1	1	1



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Course Contents:

Unit 1 Introduction, POP vs. OOP, Basic Concepts of OOP, OOP Languages, Applications of OOP, C vs. C++, Structure of C++, Simple C++ Program, Tokens, Keywords, variables, constants, basic data types, type casting, user defines data types, typecasting, operators, expressions. Control structure: decision making statements and Loops, Scope resolution operator, memory management operators, arrays, strings and structures in C++.	[6]
Unit 2 Class & Object: Introduction, Specifying a class, Access Specifiers, defining member functions, creating objects, memory allocations for objects, Static data member and static member function, Friend Function, Array of objects, Object as a Function arguments, Concept of Constructor, Types of Constructors, Multiple Constructors in a Class, Constructor with default arguments, Destructors.	[6]
Unit 3 Introduction to Inheritance, Defining a Derived Class, Visibility modes and effects, Types of Inheritance: Single, Multilevel, Multiple, Hierarchical, Hybrid, Virtual Base Class, AbstractClass, Constructor in Derived Class.	[6]
Unit 4 Concept of Pointe and Polymorphism: Pointer Declaration, Pointer Operator, Address Operator, Pointer Arithmetic, Pointer to Object: Pointer to Object, this pointer, Pointer to derived class, Intro. To polymorphism, Types of polymorphism, Compile time polymorphism: Function Overloading, Operator Overloading, Overloading Unary and Binary Operators, Rules of Operator Overloading, Run time Polymorphism: Virtual Functions, Rules for virtual functions, pure virtual functions.	[6]
Unit 5 File Handling: C++Stream Classes, Classes for file stream operations, Opening Files, Closing Files, Reading from and writing to files, Detection of EOF, File Modes.	[6]
Reference Books: <ol style="list-style-type: none">1. Object Oriented Programming with C++" by Balaguru samy.2. Object-Oriented Programming in C++" by Rajesh K Shukla.3. Object Oriented Programming in C++" by Robert Lafore4. Accelerated C++: Practical Programming by Example by Andrew Koenig and Barbara E.5. Stroustrup: The C++ Programming Language (4th Edition).	



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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

CS406	PCC	Operating system Laboratory	0-0-2	1 Credit
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Teaching Scheme:	Evaluation Scheme:
Practical: 2 hours/week	CA I:15 Marks CA II:15 Marks End Semester Exam: 20 Marks

List of Experiments:

1. Basics of UNIX commands.
2. Shell programming
3. Implementation of CPU scheduling. a) Round Robin b) SJF c) FCFS d) Priority
4. Implement all file allocation strategies
5. Implement Semaphores
6. Implement File Organization Techniques a
7. Implement Bankers algorithm for Dead Lock Avoidance
8. Implement an Algorithm for Dead Lock Detection
9. Implement the all page replacement algorithms a) FIFO b) LRU c) LFU
10. Implement Shared memory and IPC
11. Implement Paging Technique f memory management.
12. Implement Threading & Synchronization Applications




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

CS407	PCC	Database Management system Laboratory	0-0-2	1 Credit
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Teaching Scheme:	Evaluation Scheme:
Practical: 2 hours/week	CA I :15 Marks CA II :15 Marks End Semester Exam: 20 Marks

List of Experiments:

1. Study the basic concept of Database System and ER Model
2. Installation of MySQL/Oracle and practice DDL commands
 - Create table • Alter table • Drop Table
3. Installation of MySQL/Oracle and practice DML commands
 - Insert • Update • Delete
4. Implement Operations using Relational Algebra
5. Implement Structured Query Language
 - Creating Database • Creating a Database • Creating a Table • Specifying Relational Data Types • Specifying Constraints • Creating Indexes
6. Implement Aggregate Functions, Sub queries, Set operators.
7. Perform Nested and Join Queries, Cursors and Triggers, Functions and Procedures
8. Implement the concept of Normalization.
9. To implement the concept of Indexing and Hashing for data retrieval.
10. Study & Implementation of Database Backup & Recovery command by using concurrency control protocols
11. Data base connectivity techniques.
12. Design and implementation of a Database Application



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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

CS408A	PEC	OOPS using .Net Laboratory	0-0-2	1 Credit
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Teaching Scheme:	Evaluation Scheme:
Practical: 2 hours/week	CA -I :15 Marks CA -II :15 Marks End Semester Exam: 20 Marks

List of Experiments:

1. Introduction to .NET architecture
2. Demonstrate C# basic types, variables, operators
3. Make use of OOP concepts like class, objects & types
4. Implement the concept of inheritance & interface
5. Implementation of multidimensional & jagged array
6. Implementation of operator overloading
7. String manipulation in string and string builder
8. Implementation of concept of exception handling
9. Design a windows form based application for different controls
10. Design a windows form based application for field validation
11. Design any windows form based application with database connectivity with all field validation
12. Develop a windows form application that perform SELECT, INSERT, UPDATE, DELETE queries
13. Implement concept of threading



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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

CS408B	PEC	OOPS using Java Laboratory	0-0-2	1 Credit
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Teaching Scheme:	Evaluation Scheme:
Practical: 2 hours/week	CA -I :15 Marks CA -II :15 Marks End Semester Exam: 20 Marks

List of Experiments:

1. Program on various ways to accept data through keyboard and unsigned right shift operator.
2. Program on branching, looping, labelled break and labelled continue.
3. Program to create class with members and methods, accept and display details for single object.
4. Program on constructor and constructor overloading
5. Program on method overloading
6. Program on passing object as argument and returning object
7. Program on creating user defined package
8. Program on 1D array
9. Program on 2D array
10. Program on String
11. Program on String Buffer
12. Program on Vector
13. Program on single and multilevel inheritance (Use super keyword)
14. Program on abstract class
15. Program on interface demonstrating concept of multiple inheritance
16. Program on dynamic method dispatch using base class and interface reference.



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17. Program to demonstrate try, catch, throw, throws and finally.
18. Program to demonstrate user defined exception
19. Program on multithreading
20. Program on concept of synchronization
21. Program on Applet to demonstrate Graphics, Font and Color class.
22. Program on passing parameters to applets
23. Program to create GUI application without event handling using AWT controls
24. Program to create GUI application with event handling using AWT controls
25. Mini Project based on content of the syllabus. (Group of 2-3 students)




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

CS408	PEC	OOPS using C++ Laboratory	0-0-2	1 Credit
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Teaching Scheme:	Evaluation Scheme:
Practical: 2 hours/week	CA -I :15 Marks CA -II :15 Marks End Semester Exam: 20 Marks

List of Experiments:

1. Develop minimum 2 programs using constants, variables, arithmetic expression, operators, exhibiting data type conversion.
2. Develop a program to implement decision making statements (if-else, Switch).
3. Develop a program to demonstrate control structures (for, while, do-while).
4. Develop a program to implement 1- dimension array
5. Develop a program to perform matrix operations using multi-dimensional array
6. Develop a program that implements a class and use it with objects.
7. Develop a program to implements a class and create array of objects.
8. Write a program to implement friendfunction.
9. Write a program to implement inlinefunction.
10. Write a program to implement all types of constructors (constructor overloading) with



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destructor.

11. Write a program to implement single Inheritance.
12. Write a program to implementing multi-level inheritance
13. Write a program to implementing multiple inheritance.
14. Develop minimum 1 program to demonstrate pointer to object
15. Develop minimum 1 program to demonstrate pointer to derived class.
16. Write a program to demonstrate operator overloading for unary operator.
17. Write a program to demonstrate operator overloading for Binary operator.
18. Write a program to demonstrate function overloading.
19. Write a program to read and write data to and from file.




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

PRJ03	PROJ	Mini Project-III	0-0-2	1 Credits
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Teaching Scheme	Examination Scheme
Practical:- 2 hrs/week	CA-I:25 Marks CA-II: 25 Marks

Pre-Requisites:- Basic knowledge of Communication skills and Computer programming.

Course Outcomes: At the end of the course, students will be able to:

CO1	Identify the problems related to technical, social importance.
CO2	Convert open-ended problem statements into the statement of work
CO3	Identify the literature gap with the help of available literature and survey
CO4	Inculcate problem-solving skills and critically analyze the options available to solve the problem.
CO5	Conceive the importance of documentation and report writing

The project is a part of addressing societal and industrial needs. Mini project is one of the platforms that students will use to solve real-world challenges. This course focuses on the selection of methods/engineering tools/analytical techniques for problem-solving. Through this course, students gain a thorough understanding of engineering basics and ideas, gain practical experience, have the opportunity to display their skills and learn about teamwork, financial management, communication skills, and responsibility.



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Guidelines:

1. Every student shall undertake the Hackathon activity for semester IV.
2. the same group of minimum three and maximum of five students who were working for mini project II should work together in Mini project III
3. The students have to work on different approaches and finalize the best methodology to solve the problem in consultation with the project guide.
4. The students should use different tools /Techniques for the development of the solution to the problem.
5. While developing solutions, the student can take care of effective use of resources, follow ethical practices, finance management,
6. The solution should be optimal, affordable, user-friendly and environment friendly.
7. Critically analysis and testing of the solution provided.
8. By using IPR, students should reserve their rights of innovations as well as communicate new findings to society with the help of research papers.

The committee of senior faculty members and a project guide will be appointed to monitor the progress and continuous evaluation of each project. The assessment shall be done jointly by the guide and committee members.




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

MDC01	MC	Constitutions of India	1-0-0	Audit
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Teaching Scheme	Examination Scheme
Lecture: 1 hr/week	CA-I:25 Marks CA-II: 25 Marks

Pre-Requisites: Nil

Course Outcomes: At the end of the course, students will be able to:

CO1	Define the meaning and features of Indian constitution.
CO2	Interpret right to life and fundamental rights to certain freedom under article 19 and 21.
CO3	Outline the federal structure of power and directive principles of state policy.

Course Contents:

Unit 1: Meaning of the constitution law and constitutionalism, Historical perspective of the Constitution of India	[2]
Unit 2: Salient features and characteristics of the Constitution of India, Scheme of the fundamental rights , The scheme of the Fundamental Duties and its legal status	[2]
Unit 3: The Directive Principles of State Policy – Its importance and implementation , Federal structure and distribution of legislative and financial powers between the Union and the States , Parliamentary Form of Government in India – The constitution powers and status of the President	[2]



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of India	
Unit 4: Amendment of the Constitutional Powers and Procedure , The historical perspectives of the constitutional amendments in India, Emergency Provisions: National Emergency, President Rule, Financial Emergency	[2]
Unit 5: Local Self Government – Constitutional Scheme in India , Scheme of the Fundamental Right to Equality	[2]
Unit 6: Scheme of the Fundamental Right to certain Freedom under Article 19, Scope of the Right to Life and Personal Liberty under Article 21.	[2]
Books: <ol style="list-style-type: none">1. Constitution of India Published by Government of India Ministry of Law and Justice (Legislative Department), 20202. Textbook on The Constitution of India by S R Bhansali Constitution of India by Bakshi P M, January 2014	




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Yadav (Ichalkaranji) Dist. Kolhapur.



Shri Shamrao Patil (Yadravkar) Educational & Charitable Trust's
Sharad Institute of Technology College of Engineering
(An Autonomous Institute)

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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

HMS03	HSMC	Aptitude Skill- II	1-0-0	Audit
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Teaching Scheme	Examination Scheme
Lecture: 1 hrs/week	CA-I:25 Marks CA-II: 25 Marks

Pre-Requisites: Communication Skills, Aptitude Skill- I

Group A

Verbal Ability (12Hrs) (Compulsory)

Course Objectives:

1	To study basics of sentences and its structure
2	To study the tenses and its use in daily life
3	To study the basics of speeches and voices
4	To study the basic concepts of modal verbs
5	To study the different Phrases, Idioms and Proverbs
6	To build the vocabulary for day to day life

Course Outcomes: At the end of the course, students will be able to:

CO1	Understand basic concepts of sentences and its structure
CO2	Understand the tenses and its use in daily life
CO3	Explain basic uses of speeches and voices in day to day life
CO4	Understand the use of modal verbs in sentence construction
CO5	Summarize various Phrases, Idioms and Proverbs
CO6	Summarize different words used in daily life



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Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
CO2	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
CO3	1	-	-	-	-	1	-	-	-	-	-	-	-	2	-
CO4	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
CO5	-	-	-	-	-	1	-	1	-	2	-	-	-	2	-
CO6	-	-	-	-	-	1	-	1	-	2	-	-	-	2	-

Course Contents:

Unit 1: English Grammar Structure and Types of Sentence, Conditional Sentences	[2]
Unit 2: Tenses Present tense, Past tense, Future tense, Use of Tenses in Sentence forming	[2]
Unit 3: Speeches and Voices Direct and Indirect Speech, Active and Passive Voice	[2]
Unit 4: Modal Use of Modal verbs in Sentence Forming, Substitution and Elimination	[2]
Unit 5: Case studies and projects: Understanding business scenarios, Feature engineering and visualization, Scalable and parallel computing with Hadoop and Map-Reduce, Sensitivity Analysis	[2]
Unit 6: Vocabulary Vocabulary Building in Various Situations	[2]



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Text Books:

1. Raymond Murphy, Essential English Grammar with Answers, Murphy
2. Objective General English by R.S. Aggarwal, S Chand Publishing; Revised edition (15 March 2017)

Reference Books:

1. Rao N,D,V,Prasada, Wren & Martin High School English Grammar and Composition Book, S ChandPublishing, 2017
2. Murphy, Intermediate English Grammar with Answers, Cambridge University Press; Second edition




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

HMS04	HSMC	Language Skill- II	0-0-2	1 Credits
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Teaching Scheme	Examination Scheme
Practical: 2 hrs/week	CA I : 25marks CA II : 25 marks

Pre-Requisites: Communication Skills, Language Skill- I

Languages (Any One)

C Programming (Technical Language) (24Hrs)

Syllabus for C Programming

Course Objectives:

This course provides an opportunity to enhance acquisition of the fundamental elements of the C programming language. Emphasis is on the progressive development of basic programming syntaxes and essentials used in C programming

Course Outcomes: At the end of the course, students will be able to:

CO1	Illustrate the concept of Function Types, and its type
CO2	Make use of Structures and Unions.
CO3	Make use of Pointers
CO4	Illustrate the concept of File handling in C programming.



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Mapping of course outcomes with program outcomes

Course Outcomes	Program Outcomes														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	1	2	2	1	-	-	-	1	1	1	-	1	1	2	2
CO2	1	2	2	1	-	-	-	1	1	1	-	1	1	2	2
CO3	1	2	2	1	-	-	-	1	1	1	-	1	1	2	2
CO4	1	2	2	1	-	-	-	1	1	1	-	1	1	2	2

Course Contents:

<p>Unit 1: Function</p> <p>Editing, Basic of functions, Types of functions, returning non-integers external variables, scope rules, RecursionFunction</p>	[6]
<p>Unit 2: Structures and Unions</p> <p>Variable Defining a Structure, Advantage of Structure, Size of Structure, Arrays of Structures, Structures and Functions, Defining Unions.</p>	[6]
<p>Unit 3: Pointers</p> <p>Pointers to integers, characters, floats, arrays, structures.</p>	[6]
<p>Unit 4: File handling</p> <p>Initializing Introduction to dynamic memory allocation- Malloc, Calloc, Realloc, Introduction to file management, Opening/Closing a file, Input/ Output operations on Files, Error handling during I/O Operations.</p>	[6]
<p>Text Books</p> <ol style="list-style-type: none"> 1. C Programming Absolute Beginner's Guide, Que Publishing; 3rd edition (22 August 2013) 2. C Programming Language 2nd Edition, Pearson Publication <p>Reference Books</p> <ol style="list-style-type: none"> 1. C: The Complete Reference, McGraw Hill Education; 4th edition (1 July 2017) 2. C Programming in easy steps, 5th Edition, In Easy Steps Limited 	



(Signature)
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3. The C Programming Language, Second Edition, By Pearson Education India (1 January 2015)

Foreign Languages (Any One)

Japanese Language Course I (12Hrs)

Course Objectives:

This course is designed to introduce students to the everyday language of Japan. Units will be organized around natural conversational topics, leading students from fundamental aspects of grammar to readings in simple texts. Students will learn vocabulary, expressions, and sentence structures to become able to meet basic communication needs in Japanese. This course comprises all four skills (speaking, listening, reading, and writing) of language.

Course Outcomes: At the end of the course, students will be able to:

CO1	Converse in Standard Japanese to perform basic communicative tasks (e.g., exchange greetings/personal information, give time/directions/daily activities)
CO2	Make use of Japanese vocabulary effectively.
CO3	Demonstrate reading comprehension

Mapping of course outcomes with program outcomes

Course Outcome	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
CO2	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
CO3	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-

Course Contents:

Unit 1: basic communicative tasks	[4]
Learning expressions involving “---ni---gaimasu” pattern, Introduction of counters, simple translations, Communicative situations—shopping, Grammar: Introduction of adjectives, na-	



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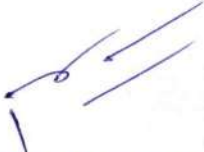


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adjectives	
Unit 2: Communicative situations Time relations, Communicative situations-confirming schedules etc, Particles and their functional use in Japanese sentences, Reading comprehension—a story	[4]
Unit 3: Easy conversation Introduction of past tense aspect in r/o verbs, and adjectives, Communicative situation : asking questions and answering, Easy conversation, Overall revision, and discussion	[4]
Text Book: Nihongo Shoho I (Japan Foundation Publ.) GENKI I: An Integrated Course in Elementary Japanese (English and Japanese Edition) Japanese for Busy People I: Kana Version (Japanese for Busy People Series) 3rd Edition Reference Book: Minna No Nihongo I (3A Corporation, Japan) Japanese from Zero! 1: Proven Techniques to Learn Japanese for Students and Professionals 6th Edition by George Trombl	




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Foreign Languages

German Language Course I (12Hrs)

Course Objectives:

Choice Based Soft Skills program offers students a choice to select the course that will meet the requirements of their overall personality development. Particularly this course helps the student in developing and improving his/her literary comprehension skills.

Course Outcomes: At the end of the course, students will be able to:

CO1	Introduce herself or himself in German.
CO2	Understand alphabets, numbers in German language
CO3	Make basic and easy sentences required in day to day situations
CO4	Read, write, speak and listen basic and simple text in German.

Mapping of course outcomes with program outcomes

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

Course Contents:

Unit 1: Introduce oneself Introduction, Greetings, German Alphabets, Numbers (1 -100), Giving and asking Information related to numbers	[3]
Unit 2: Formal and Informal form Difference between Formal and Informal form, Personal Pronouns, verb conjugation	[3]
Unit 3: Everyday situations	[3]




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Learning about the things in the classroom, Definite, indefinite, negative articles,
Possessive Articles of all thenouns

Text Books

- Netzwerk Arbetisbuch A1 Goyal Publisher.
- "The Everything Learning German Book: Speak, Write and Understand Basic German in No Time" by EdSwick
- "German Made Simple: Learn to Speak and Understand German Quickly and Easily"

Reference Books

- Eugene Jackson and Adolph Geiger
- "Hammer's German Grammar and Usage" (Fifth Edition) by Professor Martin Durrell




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S.Y. (COMPUTER SCIENCE AND ENGINEERING) Semester IV

IFT01	PROJ	Industrial Training / Field Training	----	Audit
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Teaching Scheme	Examination Scheme
Lecture: NA	End Semester Examination: 50 marks

Course Description:-

Internship / Training is educational and career development opportunity, providing practical experience in a field or discipline. At the end of the fourth semester, every student should undergo practical training in an industry / professional organization / Research laboratory with the prior approval of the HoD /TPO/Principal of the college and submit the report along with the completion certification from the Industry/ Organization. The report will be evaluated during the fifth semester by the department.

Course Outcomes: At the end of the course, students will be able to:

CO1	Verify the Technical knowledge in real industrial situations.
CO2	Develop interpersonal communication skills.
CO3	Discuss activities and functions of the industry in which the Internship/training has done.
CO4	Write the technical report.

Prerequisite: - Basics of (Programme) Engineering, Good written and Oral Communication.

Guideline for Students:-

1. Arrive at work as per schedule, ready to work and stay for the agreed upon time.
2. Present yourself in a professional manner at all times, including being appropriately dressed at workplace.




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3. Communicate any concerns with your supervisor and the internship/Training coordinator in a timely manner and respectfully.
4. Demonstrate enthusiasm and interest in what you are doing, ask questions and take the initiative as appropriate.
5. Complete and submit assigned tasks by designated timelines. Meet all deadline

Student's Diary/ Daily Log

The main purpose of writing daily diary is to cultivate the habit of documenting and to encourage the students to search for details. It develops the students' thought process and reasoning abilities. The students should record in the daily training diary the day to day account of the observations, impressions, information gathered and suggestions given, if any. It should contain the sketches & drawings related to the observations made by the students.

The daily training diary should be signed after every day by the supervisor/ in charge of the section where the student has been working. The diary should also be shown to the Faculty Mentor.

Student's Diary and Internship Report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the SITCOE immediately after the completion of the training.

It will be evaluated on the basis of the following criteria:

- Regularity in maintenance of the diary.
- Adequacy & quality of information recorded.
- Drawings, sketches and data recorded.
- Thought process and recording techniques used.
- Organization of the information.




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Internship Report

After completing the internship, the student should prepare a comprehensive report to indicate what he/she has observed and learned in the training period. Daily diary will also help to a great extent in writing the industrial report since much of the information has already been incorporated by the student into the daily diary. The competent authority should sign the training report. The Internship report should be evaluated on the basis of following criteria:

- i. Originality.
- ii. Adequacy and purposeful write-up.
- iii. Organization, format, drawings, sketches, style, language etc.
- iv. Variety and relevance of learning experience.
- v. Practical applications, relationships with basic theory and concepts taught in the course.

Evaluation of Internship/Training

The student should be evaluated based on his training report and presentation, before an expert committee constituted by the concerned department as per norms. The evaluation will be based on the following criteria:

1. Quality of content presented.
2. Proper planning for presentation.
3. Effectiveness of presentation.
4. Depth of knowledge and skills.
5. Attendance record, daily diary, departmental reports shall also be analyzed along with the Internship Report.




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