

Shivaji University, Kolhapur
REVISED STRUCTURE
S.E. COMPUTER SCIENCE AND ENGINEERING
W.E.F. 2014-15.

Semester - III

Sr. No.	Subject	L	T	P	Total	Theory Marks		TW	POE	Oral	Total Marks
						Written	Online				
1	Applied Mathematics	3	1	-	4	50	50	25	-	-	125
2	Discrete Mathematical Structures	4	1	-	5	50	50	25	-	-	125
3	Data Structures	4	-	-	4	50	50	-	-	-	100
4	Data Communications	4	-	-	4	50	50	-	-	-	100
5	Microprocessors	3	-	2	5	50	50	25	-	50	175
6	Programming Lab - I	2	-	4	6	-	-	50	50	-	100
7	Soft skills	-	-	2	2	-	-	50		25	75
	Total	20	2	8	30	250	250	175	50	75	800

Semester - IV

Sr. No.	Subject	L	T	P	Total	Theory Marks		TW	POE	Oral	Total Marks
						Written	Online				
1	Automata Theory	3	1	-	4	50	50	25	-	-	125
2	Computer Networks	4	-	2	6	50	50	25	-	50	175
3	Computer Organization	4	-	-	4	50	50	-	-	-	100
4	Operating System-I	3	1	-	4	50	50	25	-	-	125
5	Software Engineering	3	-	-	3	50	50	-	-	-	100
6	Programming Lab - II	2	-	4	6	-	-	50	50	-	100
7	Mini Project	-		2	2	-	-	25	-	50	75
	Total	19	2	8	29	250	250	150	50	100	800

Note:

1. The term work as prescribed in the syllabus is to be periodically and jointly assessed by a team of teachers from the concerned department.
2. In case of tutorials, students of different batches be assigned problems of different types and be guided for the solution of the problem during tutorial session. Problems thus solved be translated into computer programs wherever applicable and executed by respective batches during practical session.
3. The assignments of tutorials and practicals need to be submitted in the form of soft copy and / or written journal.

4. Breakup of term work marks shall be as follows:

- a. Mid-semester test – 5 marks.
- b. End-semester test – 5 marks.
- c. Tutorial assignments and / or practical performance – 15 marks.

5. The theory exam scheme is as under:

- a. All theory papers of SE (CSE) part 1& part 2 of 100 marks will be divided into two parts.
 - i. Part-A: 50 marks theory paper similar to the existing theory paper exam. The nature of the questions will be descriptive, analytical and problem solving.
 - ii. Part-B: 50 marks computer based exam with multiple choice questions (MCQs) .
- b. The marks obtained in the individual heads should be added and considered as marks of the respective theory paper out of 100 marks.
- c. The questions of part-A and part-B will be based on the entire syllabus of the respective subjects.
- d. The questions in part-B will be of 1 or 2 marks only.
- e. Duration of part-A exam will of 2 hours and that of part-B will be of 1 hour.
- f. The passing scheme for the subject will be similar to existing scheme.
- g. No separate passing head for part-A and part-B.
- h. The scheme of revaluation is not applicable for part-B, however is applicable for part-A
- i. All the existing ordinances will be applicable for passing criteria.

SEMESTER IV

AUTOMATA THEORY

Lectures: 3 hrs/week

Tutorial: 1 hr/week

Theory: 100 marks

Term work: 25 marks

Course Objectives:

1. To expose the students to the mathematical foundations and principles of computer science.
2. To strengthen the students' ability to carry out formal and higher studies in computer science.
3. To make the students understand the use of automata theory in Compilers & System programming.
4. To make the student aware of mathematical tools, formal methods & automata techniques to computing.

UNIT-I : Mathematical Induction, Regular Languages & Finite Automata: (6)

The Principle of Mathematical Induction Recursive Definitions, Definition & types of grammars & languages, Regular expressions and corresponding regular languages, examples and applications, unions, intersection & complements of regular languages, Finite automata-definition and representation, on-deterministic F.A., NFA with null transitions, Equivalence of FA's, NFA's and NFA's with null transitions.

UNIT-II: Kleene's Theorem: (3)

Part I & II statements and proofs, minimum state of FA for a regular language, minimizing number of states in Finite Automata.

UNIT-III: Grammars and Languages: (6)

Derivation and ambiguity, BNF & CNF notations, Union, Concatenation and *'s of CFLs, Eliminating production & unit productions from CFG, Eliminating useless variables from a context Free Grammar.

Parsing: (4)

Top-Down, Recursive Descent and Bottom-Up Parsing

UNIT-IV: Push Down Automata: (4)

Definition, Deterministic PDA & types of acceptance, Equivalence of CFG's & PDA's.

UNIT-V: CFL's and non CFL's : (4)

Pumping Lemma and examples, intersections and complements.

UNIT-VI: Turing Machines : (6)

Models of computation, definition of Turing Machine as Language acceptors,

combining Turing Machines, Computing a function with a TM

Variations in Turing Machines :

(3)

Turing machines with doubly-infinite tapes, more than one tape, Non-deterministic TM and Universal TM.

Text Books:

1. Introduction to Languages & theory of computations—John C. Martin (MGH) –Chapters 1, 2,3,4,5,6,7,8.
2. Discrete Mathematical Structures with applications to Computer Science—J .P.Trembley & R.Manohar (MGH) Chapter 1, 3.

Reference Book:

1. Introduction to Automata Theory, Languages and computation—John E. Hopcraft, Rajeev Motwani, Jeffrey D. Ullman (Pearson Edition).Chapters 1,3,4,5.
2. Introduction to theory of Computations—Michael Sipser (Thomson Books/Cole) Chapters 6,7,8.
3. Theory Of Computation- Vivek Kulkarni, 1st edition OXFORD university Press
4. Theory Of Computation A problem Solving Approach Kavi Mahesh Wiley India.

Term work: It should consist of minimum 10 to 12 assignments based on the topics of the syllabus and exercise problems mentioned in the text books.

COMPUTER NETWORKS

Lectures : 4 hrs / week

Practicals: 2 hrs/ week

Theory: 100 marks

Term work: 25 Marks

Oral Exam: 50 Marks

Course Objectives:

1. To learn basic concepts of network architectures.
2. To give hands on exposure to network protocols and application development.
3. To learn basic concepts of quality of services and network security.

Unit I : Network Layer (7)

Network Layer Design Issues, Routing Algorithms – Optimality Principle, Shortest Path Routing, Flooding Distance Vector Routing, Link State Routing.

Unit 2 : Logical Addressing (6)

IPV4 Addresses, IPV6 Addresses

Unit 3: Congestion Control and QoS : (5)

Congestion control: General Principle, Preventing policies, Congestion control in virtual circuit subnet, congestion control in diagram subnet Load shading, Jitter control

Quality of services (5)

Quality of services: Requirements, Techniques for achieving good quality services, integrated services, Differentiate services.

Unit 4 : Transport layer (6)

The transport service, Elements of transport protocols, Internet transport protocol – UDP, TCP.

Socket : Socket Interface and client server model. (3)

Unit 5: Application Layer (6)

Name space, Domain Name Space, Distribution of Name Space, DNS in the Internet, Resolution, DNS message , Remote Login (SSH), Electronic mail, FTP, WWW & HTTP.

Unit 6: Security (6)

Security : Cryptography – Traditional Ciphers, RSA.

Text Books:

1. Computer Networks – Andrew S. Tanenbaum (Pearson Education) 4th Edition (Chapter 1,3,4,5,7)
2. Data communication and networking – Bebrouz A. Forouzan (The McGraw- Hill) 4th Edition (Chapter 2,8)
3. Internetworking with TCP/IP- D.E. Comer (Pearson) (Chapter 6)

Reference Books:

1. Computer Networking : Principles, Technologies and protocols of network design – Natalia Olifer and victor Olifer (Wiley India Edition)
2. Data communication and computer Network – Ajit pal (PHI Learning)

Term Work: It should consist of minimum 10 experiments based on the following guidelines.

1. Implementation of file transmission using RS-232.
2. Implementation of file transmission using Stop and Wait / Go Back n / Selective Repeat protocol.
3. Implementation of Hamming code / CRC for error detection / recovery.
4. Implementation of any Routing algorithm.
5. Developing a file transfer application using TCP and UDP (socket program).
6. Develop applications to demonstrate Congestion control algorithms.
7. Implementation of Cryptographic algorithms.
8. Develop a network application to identify host id and network id of a remote machine in a IPv4 network. (All class IPs may be tested with).
9. Develop a simple email application.
10. Study of DNS, Remote login. Use of nslookup, dig, ftp, SSH, etc.

COMPUTER ORGANIZATION

Lectures :4 hrs / week

Theory : 100 marks

Course Objectives:

1. To expose students to basic concepts of computer organization.
2. To provide a comprehensive and self contained view of Computer design from hardware point of view.
3. To make the students aware of overall design and architecture of computer and its organization.
4. To provide pre-requisites for understanding concepts of advanced computer architecture.

Unit I: Basic Computer Organization

(6)

Evolution of computers - Mechanical era, Electronic computers, Generations, VLSI era , CPU organization , communications, user and supervisor modes, accumulator based CPU, System bus, instruction cycle, types of instruction(zero, one, two and three address machines), IO interface, RISC& CISC, definition, comparison and examples.

Unit II: CPU design

(4)

Specifications, (memory, speed, frequency etc.) with example, Instruction fetching, decoding, executing, Case Study (architecture, block diagram, instruction sets etc.), Pentium 4 processor, AMD processor.

Unit III: Computer Arithmetic

(12)

Data Representation, basic formats, storage order, fixed point numbers, binary, signed, decimal, hexadecimal, Floating point numbers, basic formats, normalization, biasing, IEEE754 format, Fixed point arithmetic - Addition and subtraction, overflow, high speed adders, adder expansion, Fixed point multiplication - Two's complement multiplier, Booth's algorithm, Combinational array multiplier, Fixed point division - Restoring, Non restoring algorithm, Combinational array divider, Division by repeated multiplication, Floating point arithmetic - Basic operations, Difficulties, Floating point units, Addition, subtraction, multiplication, division.

Unit IV: Control Design

(6)

Introduction, multi cycle operation, implementation methods, Hardwired control, design methods, state tables, GCD processor, Classical method, one hot method, Design example- twos complement multiplier control, CPU control unit design.

Unit V: Micro programmed control

(6)

Basic concepts, control unit organization, parallelism in microinstructions, Microinstruction addressing, timing, Control unit organization, Design example- twos complement, multiplier control, Control field encoding, encoding by function, multiple microinstruction formats.

Unit VI: Memory Organization

(10)

Types of memory, Memory systems, multilevel, address translation, memory allocation, Caches, Associative memory, direct mapping, set associative addressing.

Text Books :

1. Computer Architecture and Organization - John P Hayes (MGH) 3rd Edition.
2. Computer Systems Organization & Architecture – John D. Carpinelli (Pearson Education)

References:

1. Computer Organization - Hamacher Zaky (MGH).
2. [http://cse.stanford.edu/class/sophomore-college/projects-00/risc/riscisc/\(RISC vs CISC\)](http://cse.stanford.edu/class/sophomore-college/projects-00/risc/riscisc/(RISC%20vs%20CISC))
3. <http://www.cpu-world.com/sspec/>
4. http://www.intel.com/technology/itj/q12001/pdf/art_2.pdf (The Micro architecture of Pentium 4)
5. http://www.amd.com/us-en/assets/content_type/white_papers_and_tech_docs/30579_AMD_Processor_Evaluation_Guide3.1.pdf (AMD Processor Performance Evaluation Guide

OPERATING SYSTEM – I

Lectures: 3 hrs/week

Tutorial:1 hr/week

Theory: 100 marks

Term work:25 marks

Course Objectives:

1. To make the students understand basic concepts of operating system.
2. To expose the students to various functions of the Operating system and their usage.
3. To give hands on exposure to Linux commands and system calls.

UNIT I: Overview of OS

(6)

- 1.1 Abstract view of an operating system
- 1.2 Fundamental principles of OS operations
- 1.3 OS interaction with the computer and user programs
- 1.4 Efficiency ,system performance and user service
- 1.5 Batch Processing System
- 1.6 Multiprogramming System
- 1.7 The Time Sharing System
- 1.8 The Real Time Operating System
- 1.9 Distributed operating system
- 1.10 Operation of OS, Operating system with monolithic structure
- 1.11 Virtual machine operating system
- 1.12 Kernel based operating system, Microkernel based operating system

UNIT II: Processes, Threads and Synchronization

(6)

- 2.1 Processes and programs
- 2.2 Implementing processes
- 2.3 Threads
- 2.4 Process synchronization
- 2.5 Race condition, Critical Section, Synchronization approaches
- 2.6 Classic process synchronization problems
- 2.7 Semaphores, Monitors
- 2.8 Case studies of Process Synchronization

UNIT III: Process Scheduling

(6)

- 3.1 Scheduling terminology and concepts
- 3.2 Non preemptive scheduling policies
- 3.3 Preemptive scheduling policies
- 3.4 Long, Medium and short term scheduling
- 3.5 Performance analysis of scheduling Policies

UNIT IV: Deadlock (6)

- 4.1 What is deadlock
- 4.2 Deadlock in resource allocation
- 4.3 Handling Deadlocks : Deadlock Detection and Resolution
- 4.4 Deadlock prevention
- 4.5 Deadlock avoidance

UNIT V: Memory Management (6)

- 5.1 Managing the memory hierarchy
- 5.2 Memory allocation to a process
- 5.3 Heap Management
- 5.4 Contiguous Memory Allocation and Non Contiguous Allocation
- 5.5 Segmentation and Segmentation with paging
- 5.6 Virtual memory basics, Demand paging
- 5.7 Page replacement policies
- 5.8 Controlling memory allocation to a process

UNIT VI: File systems and I/O systems (6)

- 6.1 Overview of file processing
- 6.2 Files and file operations
- 6.3 Fundamental file organizations and access methods
- 6.4 Overview of I/O system
- 6.5 I/O hardware, Application I/O interface
- 6.6 Kernel I/O subsystem
- 6.7 Transforming I/O request to h/w operation

Text Books:

1. Operating Systems - A Concept Based approach - Dhananjay M Dhamdhare (TMGH).
2. Operating System Concepts - Abraham Silberschatz, Peter B. Galvin & Grege Gagne (Wiley)

Reference Books:

- 1) Unix Concepts and Applications – Sumtabha Das (TMGH).
- 2) Operating System : Concepts and Design - Milan Milenkovic (TMGH)
- 3) Operating System with case studies in Unix, Netware and Windows NT - Achyut S. Godbole (TMGH).

Term work: The tutorials should be conducted on the following guidelines.

1. Six assignments should be based on theoretical / analytical concepts, preferably from the exercises of the books covering all topics of the syllabus.
2. Four assignments should be on usage of Unix / Linux commands and system calls concerned with General purpose utilities, file system, handling ordinary files, basic file attributes, the Shell, the Process and Filters using regular expressions as mentioned in the reference book at serial no. 1. These assignments should be practically conducted during the tutorial sessions.

SOFTWARE ENGINEERING

Lectures: 3 hrs/week

Theory: 100 marks

Course Objectives:

1. To expose the students to basic concepts & principles of software engineering.
2. To make the student aware of the importance of SDLC in their project development work.
3. To expose the students to software testing techniques and software quality management.

Unit 1: The software Problem

(6)

- 1.1 cost, schedule & Quality
- 1.2 Scale and change
- 1.3 Software Processes: Process & Project, Component Software Processes, Software Development process Modules, Project Management Process.

Unit 2: Requirements Analysis & specification

(5)

- 2.1 Requirements gathering & Analysis
- 2.2 Software Requirements Specifications
- 2.3 Formal System Development Techniques

Unit 3 : Software Planning & Scheduling

(6)

- 3.1 Responsibilities of Software Project Manager
- 3.2 Project Planning
- 3.3 Project Scheduling
- 3.4 Project Staffing
- 3.5 People CMM
- 3.6 Risk Management

Unit 4: Design

(6)

- 4.1 Design Concepts
- 4.2 Function Oriented Design
- 4.3 Object Oriented Design
- 4.4 Detail Design
- 4.5 Verification
- 4.6 Metrics

Unit 5: Coding & Testing

(7)

- 5.1 Coding & Code Review
- 5.2 Testing
- 5.3 Unit Testing
- 5.4 Black Box Testing

- 5.5 White Box Testing
- 5.6 Program Analysis Tools
- 5.7 Integration Testing
- 5.8 System Testing

Unit 6: Software Reliability & Quality Management

(6)

- 6.1 Reliability
- 6.2 Software Quality
- 6.3 Software Quality Management System
- 6.4 ISO 9000
- 6.5 SEI capability Maturity Model
- 6.6 Six Sigma
- 6.7 Agile software Development & Extreme Programming
- 6.8 Agile Project Management

Text Books:-

- 1) Software Engineering : A precise Approach - Pankaj Jalote (Wiley India) (Unit 1, 4).
- 2) Fundamentals of Software Engineering - Rapi Mall (3rd Edition)(PHI) (Unit 2, 5, 6).
- 3) Software Engineering by Jan Sommerville (9th Edition) Pearson (Unit 6, 7 & 6.8).
- 4) Software Engineering Principles & Practices by Rohit Khurana ITLESL (2nd Edition) Vikas Publishing House Pvt. Ltd. (Unit 3).

References:-

- 1) Software Engineering - Concepts & Practices -- Ugrasen Suman (Cenage Learning)
- 2) Software Engineering Fundamentals -- Behforooz & Hudson (Oxford : Indian Edition 1st)

PROGRAMMING LABORATORY– II

Lectures: 2 hrs/week
Practical: 4 hrs/week

Term Work: 50 Marks
POE: 50 Marks

Course Objectives:

1. To expose the students to concepts of object oriented paradigm.
2. To make the students understand the use of the programming constructs of C++.
3. To give hands on exposure to develop applications based on concepts of Discrete Mathematical Structures and Data Structures using Object-Oriented approach.

Unit 1: Fundamentals of Object Oriented Programming (5)

An Overview of C++ - The Origins of C++, Encapsulation, Polymorphism, Inheritance, Function Overloading, Operator Overloading, Constructors & Destructors, C++ key words.

Classes& Objects - Relation of Classes, Structures & Union, Friend Functions, Friend Classes, Inline Functions, Parameterized constructors, Static class members, Scope resolution operators, Passing objects to functions, nested classes, and local classes.

Unit 2: Arrays & Pointers (3)

Arrays of objects, Pointers to objects, Type checking C++ Pointers, This Pointer, Pointers to derived types, Pointers to class members, Dynamic allocation operators- new & delete operators.

Unit 3: Inheritance (3)

Single Inheritance, Multilevel Inheritance, Multiple Inheritances, Hybrid Inheritance, Hierarchical Inheritance, Virtual base classes.

Unit 4: Polymorphism (3)

Overloading - Function overloading, Overloading constructor function, copy constructors, Operator overloading using friend function, Overloading new & delete operators, overloading some special operators like [],(),->,Comma operator.

Virtual Functions- Pure virtual function, calling virtual function through a base class, Abstract classes, Early vs Late binding.

File and Streams: Streams, String I/O, Character I/O, Object I/O, I/O with multiple objects, File pointers and redirections. C++ streams, C++ stream classes, RTTI, Namespace fundamentals, STL containers, STL algorithms, STL iterators. (4)

Unit5: Templates & Exception Handling:

(6)

Templates - Generic classes, Generic functions, Applying generic functions, type name & export keyword, power of templates.

Exception Handling – Fundamentals, Handling derived class exceptions, exception handling options: catching, throwing & handling of the exception.

Text Books:

1. The Complete Reference: C++ - Herbert Schildt (TMGH) Fourth Edition
2. Object-Oriented Programming in C++ - Rajesh K. Shukla (Wiley) India Edition

Reference Books:

1. Object Oriented Programming in Turbo C++ - Robert Lafore (Galgotia)
2. Object Oriented Programming with C++ - Sourav Sahay (Oxford) Second Edition

Term work:

It should comprise of minimum 14 experiments. Students of different batches should implement different programs based on the following guidelines in UNIX / Linux platform.

(A) 6 assignments should consist of implementing ALL following concepts-

Constructor, Destructor, Function overloading, Constructor overloading, Operator overloading, Multiple inheritance, Multilevel inheritance, Static variables, Function in class, Virtual function, Virtual class, Virtual destructor, Function template, Friend class and function, File handling, Templates, STL

(B) 4 assignments on implementing object oriented programs for the problems of Discrete Mathematical Structure of SE-I(CSE), like –

1. Representing a Set in bit form and implementing the set operation like-Union, Intersection, Relative Complement, symmetric difference etc.
2. Conversion of Polish expressions.
3. Obtaining path matrix and paths of different lengths.
4. Evaluating polynomial expression (PE) using linked list and performing operations on PE like Multiplication, addition subtraction, etc.
5. Check dead lock for any given resource allocation graph.

(C) 4 assignments on implementing the data structures like-

1. Implement sorting /searching algorithms using function template and virtual function.
2. Implement stack / queue using class template.
3. Implement B/B ++ tree and performing operation on the tree using object oriented concepts.
4. Create a linked list as an object. Perform merging of two objects (linked lists) and splitting of object. (Use operator overloading).
5. Implement hashing and rehashing (considering occurrence of overflow).

MINI PROJECT

Practical: 2 hrs/week Term Work: 25 Marks Oral Exam: 50 Marks

Course Objectives:

1. To expose the students to use the engineering approach to solve the real time problems.
2. To learn the skills of team building & team work.
3. To develop the logical skills and use of appropriate data structures for solving the engineering problems and puzzles.

Platforms: Free and Open source softwares.

Description:

The mini project should be undertaken preferably by a group of 3-4 students who will jointly work and implement the project. The mini project must be based upon the problem statements as that of programming contest (Advanced Computing Machines – Inter-Collegiate Programming Contest : ACM-ICPC). The problems can be referred from the web links concerned with ACM-ICPC. The group will select a problem with the approval of the guide and prepare the solution guidelines for its implementation. The same should be put in the form of synopsis (3 to 5 pages), stating the usage of logic, algorithms and suitable data structures necessary for implementation of the solution. Further the group is expected to complete analysis of problem by examining the possible different inputs to the system and the corresponding outputs. The term work submission is to be done in the form of a report containing the details of the problem, solution techniques, implementation details, input-output scenarios and the conclusion. The project must be implemented in C/C++. Graphics is optional for GUI.

Term Work Assessment:

The term work assessment will be done jointly twice in a semester by a panel of teachers appointed by the department. The term marks distribution should be as following.

- 1) Mid Term assessment - 5 MARKS.
- 2) End term assessment - 5 MARKS.
- 3) Final Performance evaluation is to be done by guide - 15 MARKS

External Oral Exam:

The external oral examination will be conducted by the examiners appointed by the University.

Equivalent subjects at SE (CSE) – I & II Pre-revised course to the Revised course of S. E. (CSE) Sem -III & IV.

SE (CSE) Part – I

Sr.no.	SE (CSE) –I (Pre-Revised)	Equivalent / Replacement subject
1	Applied Mathematics	Applied Mathematics of SE (CSE) Sem-III (Rev)
2	Discrete Mathematical Structures	Discrete Mathematical Structures of S.E(CSE) Sem-III (Revised)
3	Data Structures	Data Structures of S.E(CSE) Sem-III (Revised)
4	Computer Networks-I	Data Communication of SE (CSE) Sem-III (Rev)
5	Digital Systems & Microprocessors	Microprocessors of S.E.(CSE) Sem-III (Revised)
6	Programming Lab-I	Programming Lab-I of S.E(CSE) Sem-III (Revised)

S.E. (CSE) Part – II

Sr.no.	SE (CSE) –I (Pre-Revised)	Equivalent / Replacement subject
1	Automata Theory	Automata Theory of S.E (CSE) Sem-III (Revised)
2	Computer Networks-II	Computer Networks of S.E(CSE) Sem – IV (Revised)
3	Computer Organization	Computer Organisation of SE (CSE) Sem – IV (Revised)
4	Advanced Microprocessors	Advanced Microprocessors
5	Software Engineering	Software Engineering of S.E.(CSE) Sem-IV (Revised)
6	Programming Lab-II	Programming Lab-II of S.E(CSE) Sem-IV (Revised)

Advanced Microprocessors

Lectures : 4 hrs / week

Theory : 100 marks

Section – I

1. The Processors: 8086 –Architectures, pin Diagrams and Timing Diagrams:

Register organization of 8086, Architecture, Signal descriptions of 8086, Physical memory organization, General bus operation, I/O addressing capability, Special Processor activities, Minimum mode 8086 System and timings, Maximum mode 8086 System and timings. (5)

2. 8086 Instruction Set and Assembler Directives: Machine language Instruction Formats, Addressing modes 8086, Instruction set of 8086, assembler directives and operators. (2)

3. Special Architectural Features and Related Programming: Introduction to stack, Stack structure of 8086, Interrupts and interrupt service routines, Interrupts cycle of 8086, Non mask-able interrupt, Mask-able interrupt(INTR). (5)

4. 80286-80287 -- A Microprocessor with Memory Management and Protection: Salient features of 80286, Internal Architecture of 80286, Signal description of 80286, Real addressing modes, Protected virtual address mode (PVAM), Privilege, Protection. (5)

Section:-II

5. Interrupts and The 80386 Microprocessor : Basic Interrupt Processing, Hardware Interrupt; The 80386 Microprocessor: The memory System ; Special 80386 Registers; 80386 Memory Management : Virtual 8086 Mode , The Memory Paging Mechanism (6)

6. Recent Advances in microprocessor Architectures—A Journey from Pentium Onwards: Salient features of 80586(Pentium), A few relevant concepts of computer architecture, system architecture, Branch prediction, Enhanced instruction set of Pentium, What is MMX?, Intel MMX Architecture, MMX data type, Salient points about multimedia application programming, Journey of Pentium-Pro and Pentium- II, Pentium-III (P-III)---The CPU of the next millennium. (9)

7. Pentium , Pentium Pro and Pentium 4 Microprocessor : The Pentium Microprocessor : The Memory System; Special Pentium Registers; Pentium Memory Management; The Pentium Pro Microprocessor : Internal structure of the Pentium Pro; The Pentium 4, Memory Interface, Register Set, Hyper Threading Technology CPUID (4)

Text book:-

1. Advanced Microprocessors And Peripherals -- A.K.Roy, K.M.Bhurchandi (TMGH) 2nd Edition.

Reference books:-

1. Microprocessors and Interfacing -- Douglas V Hall (TMGH) Revised 2nd Edition.
2. The INTEL Microprocessors - Architecture ,Programming and Interfacing - Barry B. Brey Seventh Edition (PHI Ltd)
3. Microprocessors and Microcontrollers - N. Senthikumar, M. Saravanan and S. Jeevananthan (Oxford University Press).

Shivaji University, Kolhapur

REVISED STRUCTURE

T.E. Computer Science & Engg. (Semester – V & VI)
W.E.F. 2015-16.

Semester – V

Sr. No.	Subject	L	T	P	Total	Theory Marks		TW	POE	Oral	Total Marks
						Written	Online				
1	Computer Graphics	3	-	2	5	50	50	50	-	-	150
2	System Programming	3	-	2	5	100	-	50	-	25	175
3	Object Oriented Modeling and Design	3	-	-	3	50	50	-	-	-	100
4	Computer Algorithms	4	1	-	5	100	-	25	-	-	125
5	Network Technologies	4	-	-	4	50	50	-	-	-	100
6	Programming Lab - III	2	-	4	6	-	-	50	50	-	100
7	Business English	-	1	-	1	-	-	25	-	25	50
Total		19	2	8	29	350	150	200	50	50	800

Semester – VI

Sr. No.	Subject	L	T	P	Total	Theory Marks		TW	POE	Oral	Total Marks
						Written	Online				
1	Compiler Construction	3	-	2	5	50	50	25	-	-	125
2	Operating System - II	3	-	2	5	100	-	25	-	-	125
3	Database Engineering	4	-	2	6	50	50	25	50	-	175
4	Storage Networks	3	-	-	3	100	-	-	-	-	100
5	Information Security	3	1	-	4	100	-	25	-	-	125
6	Programming Lab - IV	2	-	2	4	-	-	25	50	-	75
7	Domain Specific Mini-Project	-	-	2	2	-	-	25	-	50	75
Total		18	1	10	29	400	100	150	100	50	800

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6. In case of tutorials, students of different batches be assigned problems of different types and be guided for the solution of the problem during tutorial session. Problems thus solved be translated into computer programs wherever applicable and executed by respective batches during practical session.
7. The assignments of tutorials and practicals need to be submitted in the form of soft copy and / or written journal.
8. Breakup of term work marks shall be as follows:
 - a. For subjects having term work marks 25 -
 - Mid-semester test – 5 marks.
 - End-semester test – 5 marks.
 - Tutorial assignments and / or practical performance – 15 marks.

- b. For subjects having term work marks 50 –
 - Mid-semester test – 10 marks.
 - End-semester test – 10 marks.
 - Tutorial assignments and / or practical performance – 30 marks.

5. The theory exam scheme is as under:

- 5.1 : For online exam the scheme to be followed is as under –
 - a. As mentioned in the structure above, **Three** theory papers of TE (CSE) Sem-V and **Two** theory papers of Sem-VI of 100 marks will be divided into two parts.
 - **Part-A:** 50 marks theory paper similar to the existing theory paper exam. The nature of the questions will be descriptive, analytical and problem solving.
 - **Part-B:** 50 marks computer based exam with multiple choice questions (MCQs) .
 - b. The marks obtained in the individual heads should be added and considered as marks of the respective theory paper out of 100 marks.
 - c. The questions of part-A and part-B will be based on the entire syllabus of the respective subjects.
 - d. The theory paper for part-A will consist of two sections carrying 25 marks each.
 - e. The questions in part-B will be of 1 or 2 marks only.
 - f. Duration of part-A exam will of 2 hours and that of part-B will be of 1 hour.
 - g. No separate passing head for part-A and part-B.
 - h. The scheme of moderation / revaluation is not applicable for part-B, however is applicable for part-A
- 5.2 : For theory exam of 100 marks the scheme to be followed is as under :
 - A. The theory paper of 100 marks will consist of two sections carrying 50 marks each. b. The scheme of moderation / revaluation is applicable.

6. Passing scheme is as under -

- a. The passing scheme for the subjects will be similar to existing scheme.
- b. All the existing ordinances will be applicable for passing criteria.

Equivalences of T.E. (CSE) for repeater students

TE (CSE) Sem.-V

Sr.no.	TE (CSE) –I (Pre-Revised)	Equivalent / Replacement subject (Revised)
1	Computer Graphics	Computer Graphics of TE (CSE) Sem - V
2	System Programming	System Programming of TE (CSE) Sem - V
3	Operating Systems - I	Operating Systems – I of SE (CSE) Sem - IV
4	Computer Algorithm	Computer Algorithm of TE (CSE) Sem - V
5	Programming Lab-III	Programming Lab-III of TE (CSE) Sem - V
6	Mini-Project-II	Domain Specific Mini-Project of TE(CSE) Sem-VI

T.E. (CSE) Sem.-VI

Sr.no.	TE (CSE) II (Pre-Revised)	Equivalent / Replacement subject (Revised)
1	Compiler Construction	Compiler Construction of TE (CSE) Sem - VI
2	Operating Systems - II	Operating Systems – II of TE (CSE) Sem - VI
3	Database Engineering	Database Engineering of TE (CSE) Sem - VI
4	Object Oriented Modeling & Design	Object Oriented Modeling & Design of TE (CSE) Sem - V
5	Programming Lab-IV	Programming Lab-IV of TE (CSE) Sem - VI
6	Soft Skills	Soft Skills of SE (CSE) Sem - IV

SHIVAJI UNIVERSITY, KOLHAPUR
**REVISED STRUCTURE & SYLLABUS OF B.E. COMPUTER SCIENCE &
ENGINEERING**

WITH EFFECT FROM 2016-17 (SEMESTER – VII & VIII)

SEMESTER VII

Sr. No.	Subject Name	L	T	P	Theory Marks	T/W	Oral	POE	Total Marks
1	Advanced Computer Architecture	4	-	-	100	-	-	-	100
2	Distributed Systems	3	-	2	100	50	-	-	150
3	Advanced Database Systems	3	-	2	100	25	50	-	175
4	Elective – I	3	-	-	100	-	-	-	100
5	Web Technology	3	-	4	-	50	-	50	100
6	Community Services-1	-	-	2	-	50	-	-	50
7	Project – I	-	-	4	-	50	75	-	125
	Total	16	-	14	400	225	125	50	800

SEMESTER VIII

Sr. No.	Subject Name	L	T	P	Theory Marks	T/W	Oral	POE	Total Marks
1	Cloud Computing	4	-	2	100	25	50	-	175
2	Advanced Technologies	3	-	2	100	50	-	-	150
3	Real Time Operating System	4	1	-	100	25	-	-	125
4	Elective – II	3	-	-	100	-	-	-	100
5	Network Engineering	2	-	2	-	50	-	50	100
6	Project – II	-	-	4	-	50	75	-	125
7	Community Services -2	-	2	-	-	25	-	-	25
	Total	16	2	10	400	225	125	50	800

Elective – I

1. Soft Computing
2. Project Management
3. Ad hoc Networks

Elective – II

1. Data Mining
2. Business Intelligence System
3. Introduction to Mainframes

Note:

1. The term work as prescribed in the syllabus is to be periodically and jointly assessed by a team of teachers from the concerned department.
2. In case of tutorials, students of different batches be assigned problems of different types and be guided for the solution of the problem during tutorial session. Problems thus solved be translated into computer programs wherever applicable and executed by respective batches during practical session.
3. The assignments of tutorials and practicals need to be submitted in the form of soft copy and / or written journal.
4. Breakup of term work marks shall be as follows:
 - a. For subjects having term work marks 25 -
 - Mid-semester test – 5 marks.
 - End-semester test – 5 marks.
 - Tutorial assignments and / or practical performance – 15 marks.
 - b. For subjects having term work marks 50 –
 - Mid-semester test – 10 marks.
 - End-semester test – 10 marks.
 - Tutorial assignments and / or practical performance – 30 marks.
5. Project work should be continually evaluated based on
 - a. The contributions of the group members, originality of the work, innovations brought in, research and developmental efforts, depth and applicability, etc.
 - b. Two mid-term evaluations should be done, which includes presentations and demos of the work done.
 - c. **Care should be taken to avoid copying and outsourcing of the project work.**

Special Note: Considering the pace of development in the technology the above proposed structure is likely to be revised as and when required

EQUIVALENCES OF B.E. (CSE) FOR REPEATER STUDENTS

BE (CSE) Sem.-VII

Sr. No.	BE (CSE) –I (Pre-Revised)	Equivalent / Replacement subject (Revised)
1.	Advanced Computer Architecture	Advanced Computer Architecture of B.E. (CSE) Sem - VII
2.	Distributed Systems	Distributed Systems of B.E. (CSE) Sem-VII
3.	Advanced Database Systems	Advanced Database Systems of B.E. (CSE) Sem-VII
3.	Network Engineering	Network Engineering of B.E. (CSE) Sem- VIII
5.	Elective-I	
	a. Soft Computing b. Project Management c. Cyber Laws	Soft Computing Project Management Cyber Security

BE (CSE) Sem.-VIII

Sr. No.	BE (CSE) –I (Pre-Revised)	Equivalent / Replacement subject (Revised)
1.	Grid Technology	Cloud Computing of B.E. (CSE) Sem - VII
2.	Storage Networks	Storage Networks of TE(CSE) Sem-VI
3.	Real Time Operating System	Real Time Operating System
4.	Web Technology	Web Technology of B.E.(CSE) Sem - VII
5.	Elective –II	
	a. Data Mining b. Ad-hoc Networks c. Business Intelligence System	Data Mining Ad-hoc Networks of BE (CSE) Sem-VII (EI-I) Business Intelligence System