

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonapat)

SCHEME OF STUDIES & EXAMINATIONS

B.Tech. 3rd YEAR (SEMESTER –V) COMPUTER SCIENCE AND ENGINEERING

Choice Based Credit System Scheme of Studies & Examinations w.e.f. 2020-21

Sl. No.	Course Code	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credits	Duration of Exam
			L	T	P		Theory	Practical			
1.	CSE301C	Object Oriented Programming	3	0	0	25	75	0	100	3	3
2.	CSE303C	Database Management Systems	3	0	0	25	75	0	100	3	3
3.	CSE305C	Computer Networks	3	0	0	25	75	0	100	3	3
4.	CSE307C	Formal Languages & Automata Theory	3	0	0	25	75	0	100	3	3
5.	CSE309C	Software Engineering	3	0	0	25	75	0	100	3	3
6.	PEC-I	Program Elective-I	3	0	0	25	75	0	100	3	3
7.	CSE381C	Object Oriented Programming Lab	0	0	4	25	0	75	100	2	3
8.	CSE383C	Database Management Systems Lab	0	0	4	25	0	75	100	2	3
9.	CSE385C	Professional Training (Level-2) Seminar	0	0	2	50	0	0	50	2	-
Total			18	00	10	250	450	150	850	24	24

For B.Tech (Hons) degree the students will study the following subjects in addition to the subjects mentioned above.

SEMESTER-V											
Sl. No.	Course Code	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credits	Duration of Exam
			L	T	P		Theory	Practical			
B.Tech. (Hons.) in CSE with specialization in Blockchain (H1)											
1.	CSEH301C	Network Security and Cryptography	3	0	0	25	75	0	100	3	3
2.	CSEH381C	Network Security and Cryptography Lab	0	0	4	25	0	75	100	2	3
B.Tech. (Hons.) in CSE with specialization in Cyber Security (H2)											

1.	CSEH301C	Network Security and Cryptography	3	0	0	25	75	0	100	3	3
2.	CSEH381C	Network Security and Cryptography Lab	0	0	4	25	0	75	100	2	3

B.Tech. (Hons.) in CSE with specialization in Data Science (H3)

1.	CSEH303C	Introduction to Data Science	3	0	0	25	75	0	100	3	3
2.	CSEH383C	Python for Data Science Lab	0	0	4	25	0	75	100	2	3
Total(H1/H2/H3)			3	0	4	50	75	75	200	5	6

Program Elective-I

Course Code	Course Title	Course Code	Course Title
CSE321C	Computer Graphics	CSEH301C	Network security and Cryptography ^{1,2}
CSE323C	Programming Languages	CSEH303C	Introduction to Data Science ³
CSE325C	Wireless Communication		

¹Not to be opted by B.Tech (Hons) students opting specialization in Blockchain. ²Not to be opted by B.Tech(Hons) students opting specialization in Cyber Security ³Not to be opted by B.Tech(Hons) students opting specialization in Data Sciences

NOTE:

- Assessment of Professional Training (Level-2)(CSE385C), undergone at the end of semester-IV, will be based on seminar, viva-voce, report and certificate of professional training obtained by the student from the industry / institute / research lab / training centre etc.
- Students will be permitted to opt for any one elective from the list of Program Elective-1. The minimum strength of the students should be 20 to run an elective course.
- The student pursuing B.Tech (Hons.) will choose any one out of three specializations (Blockchain (H1), Cyber security (H2) and Data Science (H3) in this semester. The specialization once chosen will remain same for next subsequent semesters.
- The students pursuing B.Tech (Hons.) can choose any subject from the list of Program Elective –I except the one from the selected specialization (Blockchain (H1), Cyber security (H2) and Data Science (H3))..
- Students will be allowed to use non-programmable scientific calculator. However, sharing of calculators will not be permitted in the examinations.

Course Objectives:

- To familiarize students with basic concepts of object oriented programming
- To familiarize students with operator overloading, inheritance, virtual functions and friend functions.
- To familiarize students with advanced concepts of object oriented programming like templates and exception handling.

SYLLABUS: B Tech (CSE)

Department: Computer Science & Engineering – 5th Semester

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

Subject: Object Oriented Programming

Subject Code: CSE301C

UNIT- I

Basic Concepts Of Object Oriented Programming:-

- Topic no.1: Procedural Vs. Object oriented,
- Topic no.2: C++ Standard Library, Preprocessor Directive
- Topic no.3: Illustrative Simple C++ Programs. Header Files and Namespaces,
- Topic no.4: Library files. Object Oriented Concepts:
- Topic no.5: Introduction to Objects and Classes, Data Abstraction,
- Topic no.6: Encapsulation (Information Hiding), Access Modifiers:
- Topic no.7: Controlling access to a class,
- Topic no.8: Method, or variable (public, protected, private),
- Topic no.9: Polymorphism, Inheritance, and Reusability **Classes: -**
- Topic no.10: Introduction, Structure Vs. Class, Class Scope and Accessing Class
- Topic no.11: Initializing Class
- Topic no.12: Objects: Constructors.

UNIT- II

Destructors, Friend Functions And Operator Overloading:-

- Topic no.13: Destructors, Static Class Members, Const(Constant)
- Topic no.14: Object And Const Member Functions, Object as Member of Classes,
- Topic no.15: Friend Function and Friend Classes, Using This Pointer,
- Topic no.16: Dynamic Memory Allocation with New
- Topic no.17: Container Classes and Iterators, Function

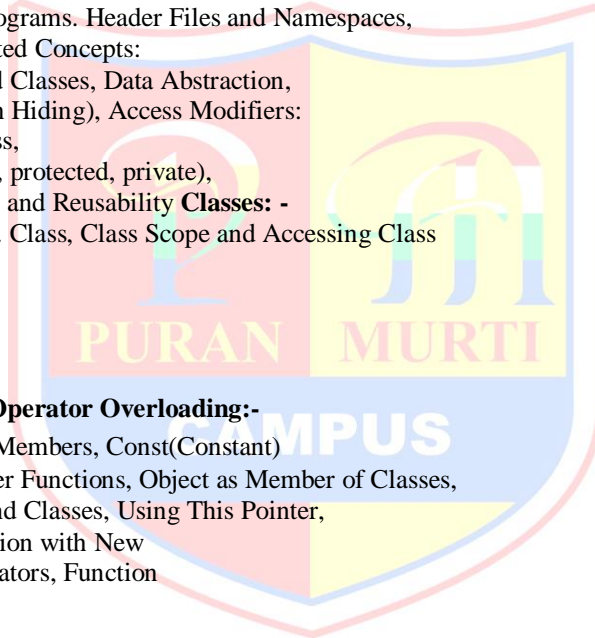
Operator Overloading:

- Topic no.18: Introduction, Fundamentals of Operator
- Topic no.19: Restrictions on Operators Overloading,
- Topic no.20: Operator Functions as Class Members vs. as Friend
- Topic no.21: Overloading Binary Operators (+, -, *, /, =),
- Topic no.22: Overloading Unary Operators(-, ++, --,)

UNIT- III

Inheritance And Virtual Functions:-

- Topic no.23: Introduction, Types of Inheritance, Base Classes And Derived Classes,
- Topic no.24: Virtual Base class, Casting Base Class Pointers to Derived- Class Pointers,
- Topic no.25: Using Member Functions,
- Topic no.26: Overriding Base - Class Members in a Derived Class,
- Topic no.27: Public, Protected and Private Inheritance,
- Topic no.28: Using Constructors and Destructors in derived Classes,
- Topic no.29: Composition Vs. Inheritance, Overloading Vs. Overriding.
- Topic no.30: Run Time Polymorphism, Introduction to Virtual Functions,
- Topic no.31: Pure Virtual Functions, Abstract Base Classes and Concrete



Topic no.31: Dynamic Binding, Virtual Destructors, Dynamic Binding.

UNIT-IV

Files, Templates And Exception Handling: -

Topic no.32: Files and I/O Streams and various operation on files.

Topic no.33: Stream Input/output Classes and Objects,

Topic no.34: Stream Output, Stream Input, Unformatted I/O (with read and write),

Topic no.35: Stream Manipulators, Stream Format States, Stream Error States.

Templates & Exception Handling: -

Topic no.36: Function Templates, Overloading Template Functions,

Topic no.37: Class Template, Class Templates and Non-Type Parameters,

Topic no.38: Templates and Inheritance, Templates and Friends.

Basics of C++ Exception Handling: -

Topic no.39: Try Throwing, Catch, and Throwing an Exception; -

Topic no.40: Catching an Exception, Re-throwing an Exception,

Topic no.41: Processing Unexpected Exceptions,

Topic no.42: Constructors, Destructors and Exception Handling.

TEXT / REFERENCE BOOKS:

1. **Object Oriented Programming in Turbo C++ by Robert Lafore, 1994, The WAITE Group Press.**
3. **C++ How to Program by H M Deitel and P J Deitel, 1998, Prentice Hall**
4. **Computing Concepts with C++ Essentials by Horstmann, 2003, John Wiley,**
5. **The Complete Reference in C++ By Herbert Schildt, 2002, TMH.**
6. **C++ Programming Fundamentals by Chuck Easttom, Firewall Media.**

Note:

In semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attempt only five questions selecting at least one question from each unit.

For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:

Examination and evaluations of students shall be conducted as per guidelines *AICTE Examinations reforms* covering the entire syllabus. The students shall be made aware about the reforms.

Course Outcomes:

After successful completion of the course, students will be able:

1. To understand the difference between object oriented programming and procedural programming.
2. To understand the basic concepts of object oriented programming
3. To understand and implement C++ features such as Operator overloading, inheritance, virtual functions and friend functions.
4. To understand and apply the concepts of templates and exception handling

SYLLABUS: B Tech (CSE)

Department: Computer Science & Engineering – 5th Semester

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

Subject: Database Management Systems

Subject Code: CSE303C

UNIT- I

Database system architecture: -

- Topic no.1: Data Abstraction, Data Independence,
- Topic no.2: Data Definition Language (DDL),
- Topic no.3: Data Manipulation Language (DML).

Data models: -

- Topic no.4: Entity-relationship model, network model,
- Topic no.5: Relational and object oriented data models,
- Topic no.6: integrity constraints, data manipulation operations.

UNIT-II

Relational query languages:-

- Topic no.7: Relational algebra, Tuple and domain relational calculus,
- Topic no.8: SQL3, DDL and DML constructs,
- Topic no.9 Open source and Commercial DBMS –MYSQL, ORACLE, DB2, SQL server.

Relational database design: -

- Topic no.10: Domain and data dependency,
- Topic no.11: Armstrong's axiom, Normal forms,
- Topic no.12: Dependency preservation, Lossless design.

Query processing and optimization: -

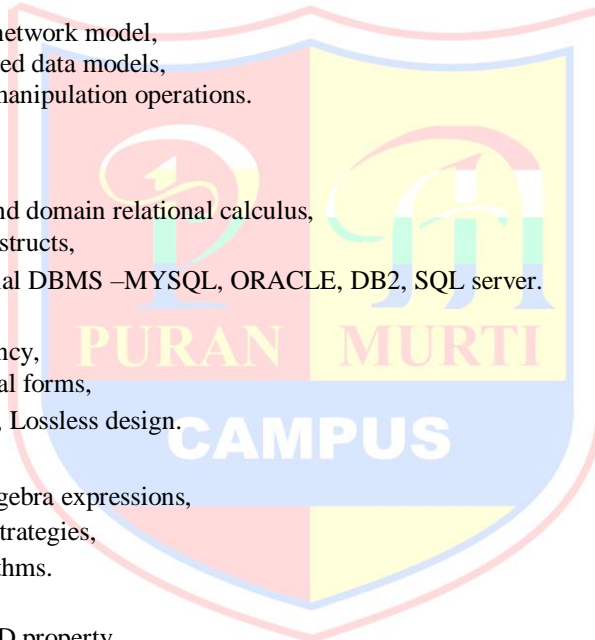
- Topic no.13: Evaluation of relational algebra expressions,
- Topic no.14: Query equivalence, Join strategies,
- Topic no.15: Query optimization algorithms.

UNIT- III

- Topic no.16: Concurrency control, ACID property,
- Topic no.17: Serializability of scheduling, Locking and timestamp based schedulers,
- Topic no.18: Multi-version and optimistic Concurrency Control schemes,
- Topic no.19: Database recovery.

UNIT- IV

- Topic no.20: Authentication, Authorization and access control,
- Topic no.21: DAC, MAC and RBAC models, Intrusion detection,
- Topic no.22: SQL injection. Advanced topics: Object oriented and object relational databases,
- Topic no.23: Logical databases, Web databases,
- Topic no.24: Distributed databases, Data warehousing and data mining.



TEXT/REFERENCES BOOKS:

1. “Database System Concepts”, 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.
2. “Principles of Database and Knowledge – Base Systems”, Vol 1 by J. D. Ullman, Computer Science Press.
3. “Fundamentals of Database Systems”, 5th Edition by R. Elmasri and S. Navathe, Pearson Education
4. “Foundations of Databases”, Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley Note:

In semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attempt only five questions selecting at least one question from each unit.

For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:

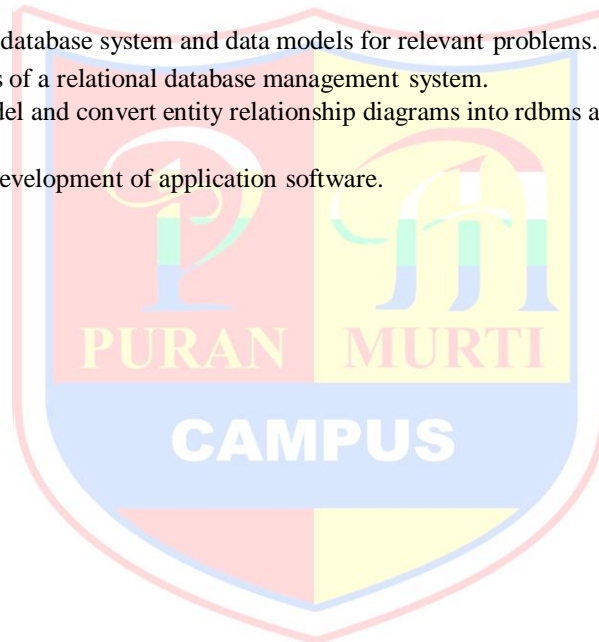
Examination and evaluations of students shall be conducted as per guidelines *AICTE Examinations reforms* covering the entire syllabus. The students shall be made aware about the reforms.

Course Outcomes

After successful completion of the course, students will be able to:

1. Understand basic concepts of database system and data models for relevant problems.
2. Understand the basic elements of a relational database management system.
Design entity relationship model and convert entity relationship diagrams into rdbms and data.
3. Apply normalization for the development of application software.

formulate SQL queries on the



SYLLABUS: B.Tech (CSE)
Department: Computer Science & Engineering – 5th Semester

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

Subject: Computer Networks
Subject Code: CSE305C
UNIT- I
OSI Reference Model and Network Architecture:

- Topic no.1: Introduction to Computer Networks, Example Networks ARPANET,
 Topic no.2: Internet, Private Networks, and Network Topologies:
 Topic no.3: Bus, Star, Ring, Hybrid, Tree, Complete,
 Topic no.4: Irregular –Topology; Types of Networks: Local Area Networks,
 Topic no.5: Metropolitan Area Networks, Wide Area Networks;
 Topic no.6 layering architecture of networks,
 Topic no.7: OSI model, Functions of each layer,
 Topic no.8: Services and Protocols of each layer.

UNIT-II

- Topic no.9: Introduction, History of TCP/IP, Layers of TCP/IP,
 Topic no.10: Protocols, Internet Protocol, Transmission Control Protocol
 Topic no.11: User Datagram Protocol, IP Addressing, IP address classes,
 Topic no.12: Subnet Addressing, Internet Control Protocols,
 Topic no.13: ARP, RARP, ICMP, Application Layer, Domain Name System,
 Topic no.14: Email – SMTP, POP, IMAP; FTP, NNTP, HTTP,
 Topic no.15: Overview of IP version 6.

UNIT-III
Local Area Networks:

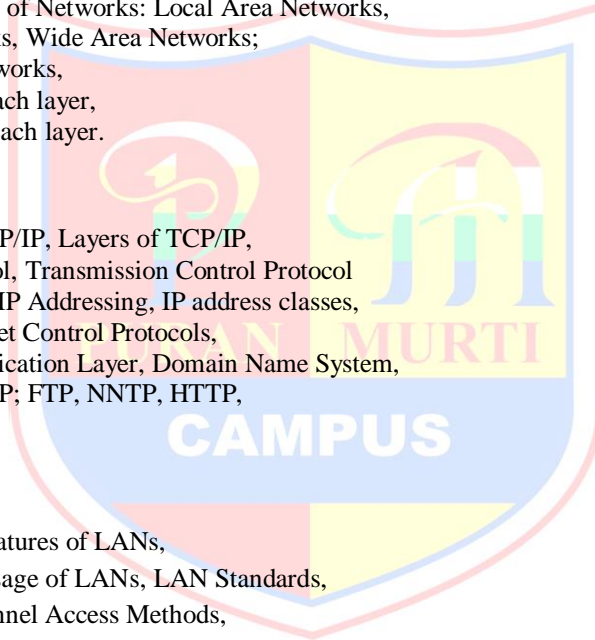
- Topic no.16: Introduction to LANs, Features of LANs,
 Topic no.17: Components of LANs, Usage of LANs, LAN Standards,
 Topic no.18: IEEE 802 standards, Channel Access Methods,
 Topic no.19: Aloha, CSMA, CSMA/CD, Token Passing, Ethernet,
 Topic no.20: Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet,
 Topic no.21: Token Ring, LAN interconnecting devices:
 Topic no.22: Hubs, Switches, Bridges, Routers, Gateways.

UNIT-IV
Wide Area Networks:

- Topic no.23: Introduction of WANs, Routing, Congestion Control,
 Topic no.24: WAN Technologies, Distributed Queue Dual Bus (DQDB),
 Topic no.25: Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET),
 Topic no.26: Asynchronous Transfer Mode (ATM), Frame Relay, Wireless Links **Introduction to**

Network Management:

- Topic no.27: Management, Class of Service, Quality Firewalls, VLANs,
 Topic no.28: Proxy Servers.
 Topic no.29: Remote Monitoring Techniques: Polling, Traps,
 Topic no.30: Performance of Service, Security management, Digital signatures, SSL



Text Book/ Reference Books:

1. **Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.**
2. **Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred, 2000, Addison Wesley, Low Price Edition.**
3. **Business Data Communications, Fitzgerald Jerry, Computer Networks – A System Approach, Larry L. Peterson & Bruce S. Davie, 2nd Edition.**

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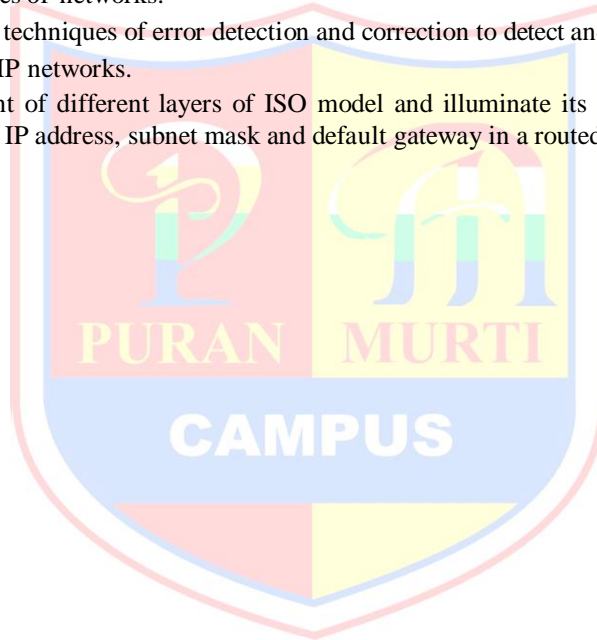
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Course Outcomes:

After successful completion of the course, students will be able to:

1. Understand the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks.
2. Apply knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission.
3. Design a network routing for IP networks.
4. Demonstrate proper placement of different layers of ISO model and illuminate its function and determine proper usage of the IP address, subnet mask and default gateway in a routed network



Department: Computer Science & Engineering – 5th Semester

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

Subject: Formal Languages & Automata Theory
Subject Code: CSE307C
UNIT- I
Basic Computational Constructs :

Topic no.1: Finite State Systems, Basic Definitions

Topic no.2: Non-Deterministic finite automata (NFA),

Topic no.3: Deterministic finite automata (DFA),

Topic no.4: Equivalence of DFA and NFA Finite automata with E-moves,

Topic no.5: Regular Expressions, Equivalence of finite automata and Regular Expressions,

Topic no.6: Regular expression conversion and vice versa.

Topic no.7: Conversion of NFA to DFA by Arden's Method

Topic no.8: Concept of basic Machine, Properties and limitations of FSM,

Topic no.9: Moore and Mealy Machines,

Topic no.10: Equivalence of Moore and Mealy machines.

UNIT-II
Regular Sets & Grammars :

Topic no.11: The Pumping Lemma for Regular Sets, Applications of the pumping lemma,

Topic no.12: Closure properties of regular sets,

Topic no.13: Myhill-Nerode Theorem and minimization of finite Automata,

Topic no.14: Minimization Algorithm. Definition,

Topic no.15: Context free and Context sensitive grammar,

Topic no.16: Ambiguity regular grammar, Reduced forms,

Topic no.17: Removal of useless Symbols and unit production,

Topic no.18: Chomsky Normal Form (CNF), Greibach Normal Form (GNF).

UNIT-III
Pushdown Automata & Turing Machines:

Topic no.19: Introduction to Pushdown Machines,

Topic no.20: Applications of Pushdown Machines

Topic no.21: Deterministic and Non-Deterministic Turing,

Topic no.22: Design of T.M, Halting problem of T.M.,

Topic no.23: Post's Correspondence Problem.

UNIT-IV
Chomsky Hierarchies & Computability:

Topic no.24: Chomsky hierarchies of grammars, unrestricted

Topic no.25: Context sensitive languages,

Topic no.26: Relation between languages of classes

Topic no.27: Primitive Recursive Functions.

TEXT BOOK/ REFERENCE BOOKS:

1. **Introduction to automata theory, language & computations- Hopcroft & O.D.Ullman, R Mothwani, Addison Wesley Publishers.**
2. **Theory of Computer Sc.(Automata, Languages and computation):K.L.P.Mishra& N.Chandrasekaran, 2000, PHI.**
3. **Introduction to formal Languages & Automata-Peter Linz, 2001, NarosaPubl.**
4. **Fundamentals of the Theory of Computation- Principles and Practice by RamondGreenlaw and H. James Hoover, 1998, Harcourt India Pvt. Ltd..**
5. **Elements of theory of Computation by H.R. Lewis & C.H. Papaditriou, 1998, PHI.**
6. **Introduction to languages and the Theory of Computation by John C. Martin 2012, T.M.H.**

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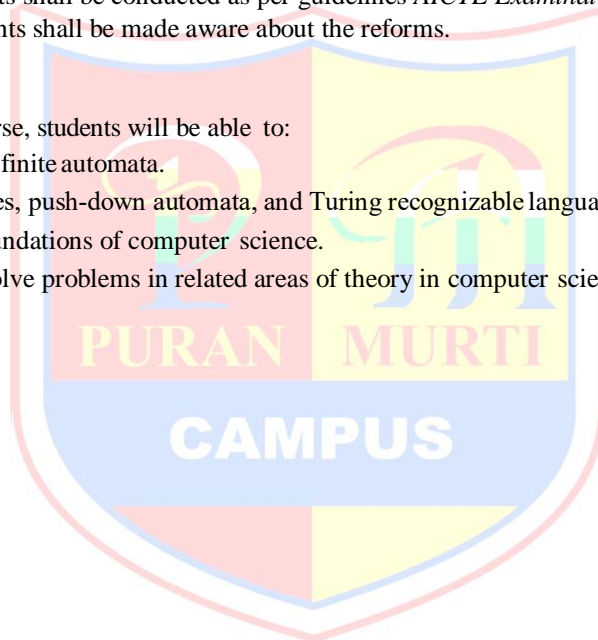
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Course Outcomes:

After successful completion of the course, students will be able to:

1. Master regular languages and finite automata.
2. Master Context- free languages, push-down automata, and Turing recognizable languages.
3. Understand the theoretical foundations of computer science.
4. Analytically and intuitively solve problems in related areas of theory in computer science.



Department: Computer Science & Engineering – 5th Semester

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

Subject: Software Engineering
Subject Code: CSE309C
UNIT- I
Introduction:-

Topic no.1: Evolving role of software, Software Characteristics,
 Topic no.2: Software crisis, Software myths, Software process,
 Topic no.3: Software development Models: Waterfall Model, Prototype M
 Topic no.4: Spiral, Model, RAD Model, Iterative Model, Incremental
 Topic no.5: Aspect-oriented Model,
 Topic no.6 Agile Methodology: Pair and mob programming,
 Topic no.7: High performance teams with core protocols, test driven development,
 Topic no.8: Behaviour driven development, continuous delivery,
 Topic no.9: Clean code, refactoring, extreme programming, Scrum.

UNIT- II
Requirements, Analysis & Specification:-

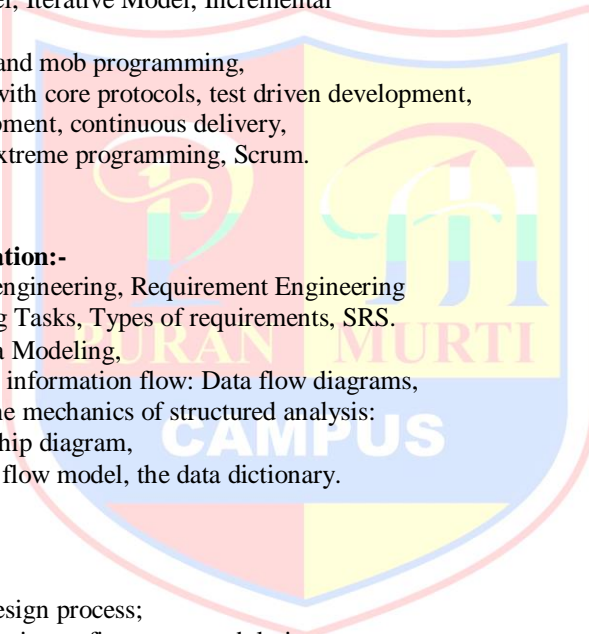
Topic no.10: Software Requirements engineering, Requirement Engineering
 Topic no.11 Requirement Engineering Tasks, Types of requirements, SRS.
 Topic no.12: **System Modeling:-** Data Modeling,
 Topic no.13: Functional modeling and information flow: Data flow diagrams,
 Topic no.14: Behavioral Modeling, The mechanics of structured analysis:
 Topic no.15: Creating entity/ relationship diagram,
 Topic no.16: data flow model, control flow model, the data dictionary.

UNIT- III
System Design:-

Topic no.17: Design principles, the design process;
 Topic no.18: Design concepts: Abstraction, refinement, modularity,
 Topic no.19: Software architecture, control hierarchy, structural partitioning,
 Topic no.20: Data structure, software procedure, information hiding;
 Topic no.21: Effective modular design: Functional independence,
 Topic no.22: Cohesion, Coupling; Design Heuristics for effective modularity,
 Topic no.23: Data Design, Architecture Design, Interface Design.

Software Testing And Maintenance:-

Topic no.24: Testing terminology: error, bug/defect/fault, failure,
 Topic no.25: Verification and validation, Test case design, Static testing,
 Topic no.26: Dynamic testing, Black box testing, Boundary value analysis,
 Topic no.27: White box testing, basis path testing, Unit testing, Integration testing,
 Topic no.28: Acceptance Testing, debugging, debugging process debugging approaches.
 Topic no.29: Software maintenance categories, Model



UNIT-IV

Software Quality Models And Standards:-

Topic no.30: Quality concepts, Software Quality Assurance, SQA

Topic no.31: Formal approaches to SQA; Statistical software quality assurance;

Topic no.32: CMM, The ISO 9126 Standard, Configuration Management,

Topic no.33: Software reengineering, reverse engineering, restructuring, forward engineering,

Software Project Management:-

Topic no.34: Project management concepts, Planning the software project,

Topic no.35: Software Estimations, empirical estimation COCOMO,

Topic no.36: Staffing, team structures, staffing, risk analysis and management.

TEXT/REFERENCES BOOK:

1. **Software Engineering – A Practitioner’s Approach, Roger S. Pressman, 1996, MGH.**
2. **Fundamentals of software Engineering, Rajib Mall, PHI**
3. **Software Engineering by Ian Sommerville, Pearson Edu., 5th edition, 1999, AW,**
4. **Software Engineering – David Gustafson, 2002, T.M.H**
5. **Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995, JW&S**
6. **An Integrated Approach to Software Engineering by Pankaj Jalote, 1991, Narosa.**

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Course Outcomes:

After successful completion of the course, students will be able to:

1. Understand basic concepts of software engineering, implement Software life cycle models and have knowledge of different estimation models.
2. Understand requirement and modeling concepts in software development.
3. Understand the different design principles of a software project and prepare soft testing strategies.
4. Understand and incorporate the Software Quality standards and build a robust software

SYLLABUS: B Tech (CSE)
Department: Computer Science & Engineering– 5th Semester

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

Subject: Computer Graphics
Subject Code: CSE321C
UNIT-I
Introduction to Computer Graphics:

- Topic no.1 What is Computer Graphics, Computer Graphics Applications
- Topic no.2 Computer Graphics Hardware and software
- Topic no.3 Two dimensional Graphics Primitives: Points and Lines
- Topic no.4 Line drawing algorithms: DDA, Bresenham's; Circle drawing algorithms
- Topic no.5 Using polar coordinates, Bresenham's circle drawing
- Topic no.6 Mid point circle drawing algorithm
- Topic no.7:Filled area algorithms: Scanline: Polygon filling algorithm
- Topic no.8:Boundary filled algorithm.

Unit-II
Two/Three Dimensional Viewing:

- Topic no.9: The 2-D viewing pipeline, windows, viewports,
- Topic no.10:Window to view port mapping; Clipping: point,
- Topic no.11:Clipping line (algorithms):- 4 bit code algorithm,
- Topic no.12:Sutherland-cohen algorithm, parametric line clipping algorithm
- Topic no.13:Polygon clipping algorithm:
- Topic no.14 Sutherland-Hodgeman polygon clipping algorithm.
- Topic no.15:Two dimensional transformations: transformations, translation,
- Topic no.16 Scaling, rotation, reflection, composite transformation.
- Topic no.17 Three dimensional transformations:
- Topic no.18 Three dimensional graphics concept,
- Topic no.19 Matrix representation of 3-D Transformations, Composition of 3-D transformation.

Unit-III
Viewing in 3D:

- Topic no.20:Projections, types of projections,
- Topic no.21: The mathematics of planner geometric projections, coordinate systems.

Hidden surface removal:

- Topic no.22: Introduction to hidden surface removal .Z- buffer algorithm ,
- Topic no.23:Scanline algorithm, area sub-division algorithm.

Unit-IV
Representing Curves and Surfaces:

- Topic no.24: Parametric representation of curves: Bezier curves, B-Spline curves.
- Topic no.25:Parametric representation of surfaces; Interpolation method.

Illumination, shading, image manipulation:

- Topic no.26: Illumination models, shading models for polygons, shadows,
- Topic no.27:Transparency. What is an image?
- Topic no.28: Filtering, image processing, geometric transformation of images.

TEXT/REFERENCE BOOKS:

1. Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addison Wesley.
2. Computer Graphics by Donald Hearn and M.Pauline Baker, 2nd Edition, 1999, PHI.
3. Procedural Elements for Computer Graphics – David F. Rogers, 2001, T.M.H Second Edition
4. Fundamentals of 3Dimensional Computer Graphics by Alan Watt, 1999, Addison Wesley.
5. Computer Graphics: Secrets and Solutions by Corrign John, BPB
6. Graphics, GUI, Games & Multimedia Projects in C by Pilania & Mahendra, Standard Publ.
7. Computer Graphics Secrets and solutions by Corrign John, 1994, BPV
8. Introduction to Computer Graphics By N. Krishanmurthy T.M.H 2002

Note:

In semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attempt only five questions selecting at least one question from each unit.

For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:

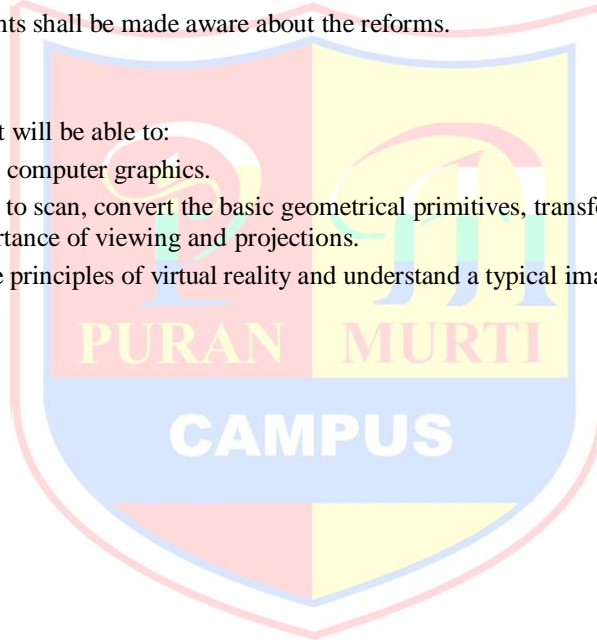
Examination and evaluations of students shall be conducted as per guidelines *AICTE Examinations reforms* covering the entire syllabus. The students shall be made aware about the reforms.

Course Outcomes:

After completing the course the student will be able to:

Understand the basics concepts used in computer graphics.

1. Implement various algorithms to scan, convert the basic geometrical primitives, transformations, area filling, clipping. Understand the importance of viewing and projections.
2. Design an application with the principles of virtual reality and understand a typical image processi



SYLLABUS: B Tech (CSE)
Department: Computer Science & Engineering– 5th Semester

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
0	-	-	4	25	75	3 hours	100

Subject: Object Oriented Programming Lab
Subject Code:CSE381C
Course Objectives:

To apply the basic knowledge of Object and classes.

To implement features of Object oriented programming like inheritance, polymorphism, operator overloading To apply the concepts of exception handling and templates.

List of hands-on experiments related to the course contents of CSE301C.

1. Raising a number n to a power p is the same as multiplying n by itself p times. Write a function called `power()` that takes a double value for n and an int value for p , and returns the result as double value Use a default argument of 2 for p . so that if this argument is omitted, the number will be squared. Write a `main()` function that gets values from the user to test this function.
2. Create the equivalent of a four function calculator. The program should request the user to enter a number, an operator, and another number. It should then carry out the specified arithmetical operation: adding, subtracting, multiplying, or dividing the two numbers. (It should use a switch statement to select the operation). Finally it should display the result.
3. When it finishes the calculation, the program should ask if the user wants to do another calculation. The response can be 'Y' or 'N'. Some sample interaction with the program might look like this.
4. Enter first number. Operator, second number: 10/3 Answer = 3.333333
5. Do another (Y/N)? Y Enter first number. Operator, second number 12 + 100 Answer = 11 Do another (Y/N)? N
6. Write a program to overload constructors.
7. Create two classes DM and DB which store the value of distances. DM stores distances in metres and centimeters and DB in feet and inches. Write a program that can read values for the class objects and add one object of DM with another object of DB. Use a friend function to carry out the addition operation. The object that stores the results maybe DM object or DB object. depending on the units in which the results are required. The display should be in the format of feet and inches or metres and centimetres depending on object on display.
8. Write a Program to overload `+, -, *, /, +=` on a class of complex numbers.
9. Write a Program to overload `+, ==` on a class of strings.
10. Create a class rational which represents a numerical value by NUMERATOR & DENOMINATOR . Write a Program to overload `+, -` for class of rational .
11. Make a class Employee with a name and salary. Make a class Manager inherit from Employee. Add an instance variable, named department, of type string. Supply a method to `toString` that prints the manager's name, department and salary. Make a class Executive inherit from Manager Supply a method to `String` that prints the string Executive followed by the information stored in the Manager superclass object. Supply a test program that tests these classes and methods.
12. Imagine a tollbooth with a class called toll Booth. The two data items of a type unsigned int to hold the total number of cars, and a type double to hold the total amount of money collected. A constructor initializes both these to 0. A member function called `payingCar()` increments the car total and adds 0.50 to the cash total. Another function, called `nopayCar()`. increments the car.
13. Write a program to create a class template to implement stack operations.
14. Write a program to demonstrate exception handling.

Course Outcomes:

After successful completion of the course, students will be able to:

1. Develop program using the concepts of object oriented programming like class, objects, constructors and destructors.
2. Develop programs using C++ features such as Operator overloading and
3. Develop programs to illustrate virtual functions and friend functions.
4. Develop programs to apply the concepts of templates and exception handling



SYLLABUS: B Tech (CSE)
Department: Computer Science & Engineering– 5th Semester

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
0	-	-	4	25	75	3 hours	100

Subject: Database Management Systems Lab
Subject Code:CSE383C
List of Experiments

1. To study Data Definition language
 - 1.1. Create, alter, drop, truncate
 - 1.2. To implement Constraints.
 - 1.2.1. (a). Primary key, (b).Foreign Key, (c). Check, (d). Unique, (e). Null, (f). Not null , (g) . Default, (h). Enable Constraints, (i). Disable Constraints (j). Drop Constraints
2. To implementation on DML, TCL and DRL
 - 2.1. (a).Insert, (b).Select, (c).Update, (d).Delete, (e).commit, (f).rollback,(g).save point, (h). Like'%', (i).Relational Operator (j) Logical operators
3. To implement Nested Queries & Join Queries
 - 3.1. (a). To implementation of Nested Queries
 - 3.2. (b). (a) Inner join, (b).Left join, (c).Right join (d).Full join(e) Natural Join (f) Theta Join (g) Cross Join
4. To implement Views
 - 4.1. (a). View, (b).joint view, (c).force view, (d). View with check option
5. To implement Index
 - 5.1 (a) Normal Index (b) Unique Index (c) Bitmap Index
 - (d) Composite (e) B-Tree (f) Clustered (g) Non- Clustered
6. To study various Date handling functions and their usage.
7. To Study String Handling Functions with Usage.
8. Case study of oracle 11g with emphasis on RECOVERY Techniques, Concurrency and Transaction Management.

Course Outcomes:

After successful completion of the course, students will be able:

1. To form queries using SQL.
2. To store and access data from database.
3. To use different data processing functions.

SYLLABUS: B Tech (CSE)**Department: Computer Science & Engineering– 5th Semester**

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
0	-	-	4	25	75	3 hours	100

Subject: Professional Training (Level-2) Seminar**Subject Code: CSE385C****Course Objectives:**

1. Acquire knowledge of the industry in which the internship is done.
2. Apply knowledge and skills learned in the classroom in a work setting.
3. To decide the future application areas of Computer Science and Engineering.

At the end of 4th semester each student would undergo four weeks Professional Training in an Industry/ institute/ Professional / Organization/ Research Laboratory etc. with the prior approval. The student has to submit a typed report in the department along with a certificate from the organization. The typed report should be in a prescribed format.

The report will be evaluated in the 5th Semester by a Committee consisting of three teachers from different specialization to be constituted by the Chairperson of the department. The basis of evaluation will primarily be the knowledge and exposure of the student towards different processes and the functioning of the organization. The student will interact with the committee through presentation to demonstrate his/her learning. Teachers associated with evaluation work will be assigned 2 periods per week load.

Course Outcomes:

After completing the course the students will have:

1. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
2. An ability to work in a multidisciplinary team
3. An ability to identify, formulate, and solve engineering problems
4. An understanding of professional and ethical responsibility.