Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat) 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	Teac Sche	hing		Marks	Examinati		xaminati Total Credit		Duratio n of
110.			Sent	uuic		work					Exam
			L	T	Р		Theo ry	Prac tical			
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	Teach	Teaching Schedule			Exam M	ination arks	Total	Credit s	Duration of Exam	
1.00			L	L T P			Theory	Practical		5		
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	specia	lization ii	n Data S	Science (H	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	Course Title	Course	Course Title
Code		Code	
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:

- 1. 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.
- 2. 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.
- 3. 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.
- 4. 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))..
- 5. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculators will not be permitted in the examinations.

			CSE 301C OF	SJECT ORIENTED PROGRAMMING		
			B. Tech. Seme	ster – V (Computer Science and Engg.)		
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

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

UNIT- I

Basic Concepts Of Object Oriented Programming:- Procedural Vs. Object oriented Programming, C++ Standard Library, Preprocessor Directives, illustrative Simple C++ Programs. Header Files and Namespaces, library files. Object Oriented Concepts: Introduction to Objects and Classes, Data Abstraction, Encapsulation (Information Hiding), Access Modifiers: Controlling access to a class, method, or variable (public, protected, private), Polymorphism, Inheritance, and Reusability

Classes: - Introduction, Structure Vs. Class, Class Scope and Accessing Class Members, Initializing Class Objects: Constructors.

UNIT- II

Destructors, Friend Functions And Operator Overloading:- Destructors, Static Class Members, Const(Constant) Object And Const Member Functions, Object as Member of Classes, Friend Function and Friend Classes, Using This Pointer, Dynamic Memory Allocation with New and Delete, Container Classes and Iterators, Function overloading

Operator Overloading: - Introduction, Fundamentals of Operator Overloading, Restrictions on Operators Overloading, Operator Functions as Class Members vs. as Friend Functions, Overloading Binary Operators (+,-,*,/,=), Overloading Unary Operators(-,++,-,)

UNIT- III

Inheritance And Virtual Functions:- Introduction, Types of Inheritance, Base Classes And Derived Classes, Virtual Base class, Casting Base Class Pointers to Derived- Class Pointers, Using Member Functions, Overriding Base - Class Members in a Derived Class, Public, Protected and Private Inheritance, Using Constructors and Destructors in derived Classes, Composition Vs. Inheritance, Overloading Vs. Overriding. Run Time Polymorphism, Introduction to Virtual Functions, Pure Virtual Functions, Abstract Base Classes and Concrete Classes, Dynamic Binding, Virtual Destructors, Dynamic Binding.

UNIT-IV

Files, Templates And Exception Handling: - Files and I/O Streams and various operation on files. Stream Input/output Classes and Objects, Stream Output, Stream Input, Unformatted I/O (with read and write), Stream Manipulators, Stream Format States, Stream Error States.

Templates & Exception Handling: - Function Templates, Overloading Template Functions, Class Template, Class Templates and Non-Type Parameters, Templates and Inheritance, Templates and Friends.

Basics of C++ Exception Handling: - Try Throwing, Catch, and Throwing an Exception; - Catching an Exception, Re-throwing an Exception, Processing Unexpected Exceptions, Constructors, Destructors and Exception Handling.

TEXT / REFERENCE BOOKS:

- 1. Object Oriented Programming in Turbo C++ by Robert Lafore ,1994, The WAITE Group Press.
- 2. Programming with C++ By D Ravichandran, 2003, T.M.H 3. Object oriented Programming with C++ by E Balagurusamy, 2001, Tata McGraw-Hill.
- 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:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- **3.** 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

			CSE303C DA	TABASE MANAGEMENT SYSTEMS	5	
			B. Tech. Seme	ester – V (Computer Science and Engg.))	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

- 1. To understand the different issues involved in the design and implementation of a database system.
- 2. To study the physical and logical database designs, database modeling, relational, hierarchical, and network models
- 3. To understand and use data manipulation language to query, update, and manage a Database
- 4. To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency, distributed database, and intelligent database, Client/Server (Database Server), Data Warehousing.

UNIT-I

Database system architecture: - Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML).

Data models: - Entity-relationship model, network model, relational and object oriented data models, integrity constraints, data manipulation operations.

UNIT-II

Relational query languages:- Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQL server.

Relational database design: - Domain and data dependency, Armstrong's axiom, Normal forms, Dependency preservation, Lossless design.

Query processing and optimization: - Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.

UNIT-III

Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp based schedulers, Multi-version and optimistic Concurrency Control schemes, Database recovery.

UNIT-IV

Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection. Advanced topics: Object oriented and object relational databases, Logical databases, Web databases, 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:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- **3.** 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.
- 3. Design entity relationship model and convert entity relationship diagrams into rdbms and formulate SQL queries on the data.
- 4. Apply normalization for the development of application software.

			CSE30	5C COMPUTER NETWORKS		
			B. Tech. Seme	ester – V (Computer Science and Engg.)		
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

1. To learn the concepts, vocabulary and techniques currently used in the area of computer networks.

COMPLETED NETWORK

- 2. To understand the concepts of the OSI model and the TCP/IP model.
- 3. To be familiar with wireless networking concepts
- 4. To be familiar with contemporary issues in networking technologies.

UNIT- I

OSI Reference Model and Network Architecture: Introduction to Computer Networks, Example Networks ARPANET, Internet, Private Networks, and Network Topologies: Bus, Star, Ring, Hybrid, Tree, Complete, Irregular –Topology; Types of Networks: Local Area Networks, Metropolitan Area Networks, Wide Area Networks; layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer.

UNIT-II

TCP/IP: Introduction, History of TCP/IP, Layers of TCP/IP, Protocols, Internet Protocol, Transmission Control Protocol, User Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing, Internet Control Protocols, ARP, RARP, ICMP, Application Layer, Domain Name System, Email – SMTP, POP,IMAP; FTP, NNTP, HTTP, Overview of IP version 6.

UNIT-III

Local Area Networks: Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, IEEE 802 standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.

UNIT-IV

Wide Area Networks: Introduction of WANs, Routing, Congestion Control, WAN Technologies, Distributed Queue Dual Bus (DQDB), Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay, Wireless Links

Introduction to Network Management: Management, Class of Service, Quality Firewalls, VLANs, Proxy Servers.

Remote Monitoring Techniques: Polling, Traps, 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.

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- **3.** 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 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.

			CSE307C FORMA	L LANGUAGES & AUTOMATA THI	EORY	
			B. Tech. Seme	ster – V (Computer Science and Engg.))	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

- 1. To understand the basic properties of formal languages and formal grammars
- 2. To understand the basic properties of deterministic and nondeterministic finite automata
- 3. To understand the basic properties of Turing machines and computing with Turing machines
- 4. To understand the concepts of tractability and decidability, the concepts of NP-completeness and NP-hard problems

UNIT-I

Basic Computational Constructs : Finite State Systems, Basic Definitions Non-Deterministic finite automata (NDFA), Deterministic finite automata (DFA), Equivalence of DFA and NDFA Finite automata with E-moves, Regular Expressions, Equivalence of finite automata and Regular Expressions, Regular expression conversion and vice versa. Conversion of NFA to DFA by Arden's Method Concept of basic Machine, Properties and limitations of FSM, Moore and Mealy Machines, Equivalence of Moore and Mealy machines.

UNIT-II

Regular Sets& Grammars : The Pumping Lemma for Regular Sets, Applications of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm. Definition, Context free and Context sensitive grammar, Ambiguity regular grammar, Reduced forms, Removal of useless Symbols and unit production, Chomsky Normal Form (CNF), Griebach Normal Form (GNF).

UNIT-III

Pushdown Automata & Turing Machines: Introduction to Pushdown Machines, Applications of Pushdown Machines Deterministic and Non-Deterministic Turing Machines, Design of T.M., Halting problem of T.M., Post's Correspondence Problem.

UNIT-IV

Chomsky Hierarchies & Computability: Chomsky hierarchies of grammars, unrestricted grammars, Context sensitive languages, Relation between languages of classes Primitive Recursive Functions.

TEXT BOOK/ REFERENCE BOOKS:

- 1. Introduction to automata theory, language & computations- Hopcroaft & 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.

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- **3.** 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. 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.

			CSE309	C SOFTWARE ENGINEERING		
			B. Tech. Seme	ster – V (Computer Science and Engg.))	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

- 1. To enable students to apply a systematic application of scientific knowledge in creating and building cost effective software solutions to business and other types of problems.
- 2. To make students understand different phases to make a software & study them in detail.
- 3. To make students understand different testing techniques for different projects, making the students understand to develop quality software, its maintenance & software reliability.
- 4. To make students aware about the design models & its principles (data design, component design, interface design & architectural design).

UNIT- I

Introduction:- Evolving role of software, Software Characteristics, Software crisis, Software myths, Software process, Software development Models: Waterfall Model, Prototype Model, Spiral, Model, RAD Model, Iterative Model, Incremental Model, Aspect-oriented Model, **Agile Methodology:** Pair and mob programming, high performance teams with core protocols, test driven development, behaviour driven development, continuous delivery, clean code, refactoring, extreme programming, Scrum.

UNIT- II

Requirements, Analysis & Specification:- Software Requirements engineering, Requirement Engineering Process, Requirement Engineering Tasks, Types of requirements, SRS. System Modeling:- Data Modeling, Functional modeling and information flow: Data flow diagrams, Behavioral Modeling, The mechanics of structured analysis: Creating entity/ relationship diagram, data flow model, control flow model, the data dictionary.

UNIT-III

System Design:- Design principles, the design process; Design concepts: Abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure, software procedure, information hiding; Effective modular design: Functional independence, Cohesion, Coupling; Design Heuristics for effective modularity, Data Design, Architecture Design, Interface Design. **Software Testing And Maintenance:-** Testing terminology: error, bug/defect/fault, failure, Verification and validation, Test case design, Static testing, Dynamic testing, Black box testing, Boundary value analysis, White box testing, basis path testing, Unit testing, Integration testing, Acceptance Testing, debugging process debugging approaches. Software maintenance categories, Models.

UNIT-IV

Software Quality Models And Standards:- Quality concepts, Software Quality Assurance, SQA activities, Formal approaches to SQA; Statistical software quality assurance; CMM, The ISO 9126 Standard, Configuration Management, Software reengineering, reverse engineering, restructuring, forward engineering,

Software Project Management:- Project management concepts, Planning the software project, Software Estimations, empirical estimation COCOMO, 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. Hudson1995, JW&S
- 6. An Integrated Approach to Software Engineering by Pankaj jalote, 1991, Narosa.

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- **3.** 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 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

CSE381C	OBJECT	ORIENTED	PROGR	AMMING	LAB
---------	--------	----------	-------	--------	-----

			B. Tech. Sem	ester – V (Computer Science and Engg.)		
L	Т	Р	Credits	Class Work	:	25 Marks
0	0	4	2	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

- 1. To apply the basic knowledge of Object and classes.
- **2.** To implement features of Object oriented programming like inheritance, polymorphism, operator overloading
- 3. To apply the concepts of exception handling and templates.

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

- 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 (YI N)? Y Enter first number. Operator, second number 12 + 100 Answer = 11 Do another (Y I 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

CSE383C DATABASE MANAGEMENT SYSTEM LAB

			B. Tech. Seme	ster – V (Computer Science and Engg.	.)	
L	Т	Р	Credits	Class Work	:	25 Marks
0	0	4	2	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To have good knowledge of query formation using SQL.
- 2. To have knowledge of Storage and access techniques of Data from Database.
- 3. To be familiar with different functions used for data processing in DBMS

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.

CSE385C PROFESSIONAL TRAINING(Level-2) Seminar

B. Tech. Semester – V (Computer Science and Engg.)									
L	Т	Р	Credits	Class Work	:	50 Marks			
-	-	2	2	Total	:	50 Marks			

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.

Program Elective – I

			CSE32	IC COMPUTER GRAPHICS		
			B. Tech. Seme	ster – V (Computer Science and Engg	.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0	3	3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To list the basics concepts used in computer graphics.
- 2. To implement various algorithms to scan, convert the basic geometrical primitives. transformations, area filling, clipping.
- 3. To describe the importance of viewing and projections.
- 4. To design an application with the principles of virtual reality and understand a typical image processing.

Unit-I

Introduction to Computer Graphics: What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, Two dimensional Graphics Primitives: Points and Lines, Line drawing algorithms: DDA, Bresenham's: Circle drawing algorithms: Using polar coordinates, Bresenham's circle drawing, mid point circle drawing algorithm; Filled area algorithms: Scanline: Polygon filling algorithm, boundary filled algorithm.

Unit-II

Two/Three Dimensional Viewing: The 2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherlandcohen algorithm, parametric line clipping algorithm (Cyrus Beck).

Polygon clipping algorithm: Sutherland-Hodgeman polygon clipping algorithm. Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation.

Three dimensional transformations: Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation.

Unit-III

Viewing in 3D: Projections, types of projections, the mathematics of planner geometric projections, coordinate systems.

Hidden surface removal: Introduction to hidden surface removal .Z- buffer algorithm, scanline algorithm, area sub-division algorithm.

Unit-IV

Representing Curves and Surfaces: Parametric representation of curves: Bezier curves, B-Spline curves.

Parametric representation of surfaces; Interpolation method.

Illumination, shading, image manipulation: Illumination models, shading models for polygons, shadows,

transparency. What is an image? 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
- 2. K. Feiner and Johb F. Hughes, 2000, Addision Wesley.
- 3. Computer Graphics by Donald Hearn and M.Pauline Baker, 2nd Edition, 1999, PHI.
- Procedural Elements for Computer Graphics David F. Rogers, 2001, T.M.H Second Edition
- 5. Fundamentals of 3Dimensional Computer Graphics by Alan Watt, 1999, Addision Wesley.
- 6. Computer Graphics: Secrets and Solutions by Corrign John, BPB
- 7. Graphics, GUI, Games & Multimedia Projects in C by Pilania & Mahendra, Standard Publ.
- 8. Computer Graphics Secrets and solutions by Corrign John, 1994, BPV
- 9. Introduction to Computer Graphics By N. Krishanmurthy T.M.H 2002

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

- 1. Understand the basics concepts used in computer graphics.
- 2. Implement various algorithms to scan, convert the basic geometrical primitives, transformations, area filling, clipping.
- 3. Understand the importance of viewing and projections.
- 4. Design an application with the principles of virtual reality and understand a typical image processing.

			CSE323C	PROGRAMMING LANGUAGES		
			B. Tech. Semes	ter – V (Computer Science and Engg	g.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0	3	3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

- 1. To understand the issues involved in programming language design and implementation.
- 2. To have an in-depth understanding of functional, logic, and object-oriented programming paradigms.
- 3. Understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing.
- 4. To develop an understanding of the compilation and storage process.

Unit-I

Introduction: Syntactic and semantic rules of a Programming language, Characteristics of a good programming language, Programming language translators compiler & interpreters, Virtual Computers & Binding times; Introduction to procedural, non-procedural, structured, functional and object oriented programming language, Comparison of C & C++ programming languages.

Unit-II

Elementary & Structured Data Types : Elementary data types – data objects, variable & constants, data types, Specification & implementation of elementary data types, Declarations, type checking & type conversions, Assignment & initialization, Numeric data types, enumerations, Booleans & characters Structured data types& data Objects, specification & implementation of structured data types, Declaration & type checking of data structure ,vector & arrays, records Character strings, variable size data structures, Union, pointer & programmer defined data objects, sets, files.

Unit–III

Sequence Control& Data Control:Implicit & explicit sequence control ,sequence control within expressions, sequence control within statement, Subprogram sequence control: simple call return ,recursive subprograms, Exception & exception handlers, co routines, sequence control .

Data Control:-Names & referencing environment, static & dynamic scope, block structure, Local data & local referencing environment, Shared data (dynamic & static scope) ; Parameters& parameter transmission schemes.

Unit-IV

Storage Management& other features: Major run time elements requiring storage, programmer and system controlled storage management & phases, Static storage management, Stack based storage management, Heap storage management, variable & fixed size elements. Evolution of data type concept, abstraction, encapsulation & information hiding, Subprograms, type definitions, abstract data types

TEXT/REFERENCE BOOKS:

- 1. Programming languages Design & implementation by T.W. .Pratt, 1996, Prentice Hall Pub.
- 2. Programming Languages Principles and Paradigms by Allen Tucker & Robert Noonan, 2002, TMH.
- 3. Fundamentals of Programming languages by Ellis Horowitz, 1984, Galgotia publications (Springer Verlag),
- 4. Programming languages concepts by C. Ghezzi, 1989, Wiley Publications.

5. Programming Languages – Principles and Pradigms, Allen Tucker, Robert Noonan 2002, T.M.H.

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

- 1. Understand the concepts involved in programming language design and implementation.
- 2. Understand the functional, logic, and object-oriented programming paradigms.
- 3. Understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing.
- 4. Understand the compilation and storage process.

			CSE325C	WIRELESS COMMUNICATION		
			B. Tech. Seme	ster – V (Computer Science and Engg	j.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0	0	3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

- 1. To know about the evolution of wireless communication systems and various generations of cellular systems.
- 2. To understand the basic design principles of cellular systems.
- 3. To understand the advanced multiple access techniques.

4. To understand the diverse reception techniques and applications of cellular networks.

UNIT 1:

INTRODUCTION TO WIRELESS COMMUNICATION SYSTEMS: Evolution of mobile radio communications, examples of wireless comm. systems, paging systems, Cordless telephone systems, comparison of various wireless systems.

MODERN WIRELESS COMMUNICATION SYSTEMS: Second generation cellular networks, third generation wireless networks, wireless in local loop, wireless local area networks, Blue tooth and Personal Area networks.

UNIT 2:

INTRODUCTION TO CELLULAR MOBILE SYSTEMS: Spectrum Allocation, basic Cellular Systems, performance Criteria, Operation of cellular systems, analog cellular systems, digital Cellular Systems.

CELLULAR SYSTEM DESIGN FUNDAMENTALS: Frequency Reuse, channel assignment strategies, handoff Strategies, Interference and system capacity, tracking and trade off service, improving coverage and capacity.

UNIT 3:

MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION: Introduction to Multiple Access, FDMA, TDMA, Spread Spectrum multiple Access, space division multiple access, packet ratio, capacity of a cellular systems.

UNIT 4:

WIRELESS NETWORKING: Difference between wireless and fixed telephone networks, development of wireless networks, fixed network transmission hierarchy, traffic routing in wireless networks, wireless data services, common channel signaling, ISDN (Integrated Services digital Networks), advanced intelligent network.

INTELLIGENT CELL CONCEPT AND APPLICATION: Intelligent cell concept, applications of intelligent micro-cell Systems, in-Building Communication, CDMA cellular Radio Networks.

TEXT/REFERENCE BOOKS:

- 1. Wireless Communications: Theodore S. Rappaport; Pearsons.
- 2. Mobile Cellular Telecommunication: W.C.Y.Lee; McGraw Hill
- 3. Mobile Communications: Jochen Schiller; Pearson

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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

- 1. Understand the evolution of wireless communication systems and various generations of cellular systems.
- 2. Understand the basic design principles of cellular systems.
- 3. Understand the advanced multiple access techniques.
- 4. Understand the diverse reception techniques and applications of cellular networks.

CSEH301C NETWORK SECURITY AND CRYPTOGRAPHY

			B. Tech. Semes	ter – V (Computer Science and Engg.	.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0	0	3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To understand cryptography theories; algorithms & systems.
- 2. To understand the symmetric and asymmetric key algorithms.
- 3. To understand necessary approaches & techniques to build protection mechanisms in order to secure Computer Networks.
- 4. Acquire fundamental knowledge on the concepts of different security layers.

UNIT- I

Introduction: Plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography.

UNIT- II

Symmetric Key Algorithms:- Introduction, algorithms types and modes, DES, AES. **Asymmetric Key Algorithms:** Introduction, history of asymmetric key cryptography, RSA symmetric and asymmetric key cryptography together, Digital signature.

UNIT- III

Internet Security Protocols: Basic concepts, Secure Socket Layer (SSL), Transport Layer Security (TLS), Secure Hyper Text Transfer protocol (SHTTP), Time Stamping Protocol (TSP), Secure Electronic Transaction (SET), S SL versus SET, Electronic Money, Email Security.

UNIT- IV

User Authentication And Kerberos:- Introduction, Authentication basics, Passwords, authentication tokens, certificate based authentication, biometric based authentication, Kerberos, key distribution center(KDC), Security handshake pitfalls, single Sign on(SSO) approach.

TEXT/ REFERENCE BOOKS:

- 1. Cryptography and Network Security, 2nd Edition by Atul Kahate, TMH
- 2. Network Management Principles & Practices by Subramanian, Mani (AWL)
- 3. SNMP, Stalling, Willian (AWL)
- 4. SNMP: A Guide to Network Management (MGH)
- 5. Telecom Network Management by H.H. Wang (MGH)
- 6. Network Management by U. Dlack (MGH)

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

- 1. Compare various cryptographic techniques.
- 2. Work with symmetric & asymmetric key algorithms.
- 3. Design secure applications.
- 4. Inject secure coding in the developed applications.

CSEH303C INTRODUCTION TO DATA SCIENCE

			B. Tech. Semest	er – V (Computer Science and Engg	.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To understand the basic concepts of Data science and data pre-processing
- 2. To analyze data using Statistics and Probability techniques
- 3. To understand the basic concepts of clustering and classification techniques
- 4. To understand of the key techniques and theory used in visualization, including data models, graphical perception and techniques for visual encoding and interaction.

UNIT- I

Introduction:- Benefits and uses of data science and big data, Facets of data, Sources of data, Data collection and APIs, Exploring and fixing data, Data storage and management, data science process, Data pre-processing: Data Cleaning, Data Integration, Data Reduction, Data Transformation and Data Discretization, Data science toolkit.

UNIT- II

Data analysis:- Introduction, Terminology and concepts, Introduction to statistics, Central tendencies and distributions, Variance, Distribution properties and arithmetic, Samples/CLT Probability: Random experiments, trial, sample space, events. Approaches to probability - classical, empirical, subjective and axiomatic. Theorems on probabilities of events. Addition rules of probability. Conditional probability, independence of events and multiplication rule of probability.

UNIT-III

Classification:- Basic Concepts, Decision Tree Induction, Bayes Classification Methods, Rule-Based Classification, Model Evaluation and Selection, Techniques to Improve Classification Accuracy, Support Vector Machines, Lazy Learners (or Learning from Your Neighbors)

Cluster Analysis:- Basic Concept and Methods Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Evaluation of Clustering, Clustering High-Dimensional Data, Clustering Graph and Network Data.

UNIT- IV

Data visualization:- Introduction, Types of data visualization, Data for visualization: Data types, Data encodings, Retinal variables, Mapping variables to encodings, Visual encodings.

TEXT/ REFERENCE BOOKS:

- 1. Davy Cielen Arno D. B. Meysman Mohamed Ali "Introducing data Science,"
- 2. Rachel Schutt and Cathy O'Neil, "Doing Data Science"

- **3.** Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to DataMining", Person Education, 2007.
- 4. K.P. Soman, Shyam Diwakar and V. Ajay,"Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2016.
- 5. Gupta, "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

- 1. Perform the pre-processing of data and apply mining techniques on it.
- 2. Analyze data using data using Statistics and Probability techniques
- 3. Perform clustering and classification techniques
- 4. Present analyzed data using visualization tools

CSEH381C NETWORK SECURITY AND CRYPTOGRAPHY LAB

			B. Tech. Semes	ster – V (Computer Science and Engg	.)	
L	Т	Р	Credits	Class Work	:	25 Marks
-	-	4	2	Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To provide deeper understanding into cryptography, its application to network security, threats/vulnerabilities to networks and countermeasures.
- 2. To explain various approaches to Encryption techniques, strengths of Traffic Confidentiality, Message Authentication Codes.
- 3. To familiarize symmetric and asymmetric cryptography
- 4. Design secure applications

Lab Exercises to be given by the concerned faculty based on the subject CSEH301C Network Security and Cryptography

COURSE OUTCOMES:

At the end of this course students will be able to:

- 1. Identify basic security attacks and services
- 2. Use symmetric and asymmetric key algorithms for cryptography
- 3. Make use of Authentication functions.
- 4. Design secure applications

CSEH383C PYTHON FOR DATA SCIENCE LAB

			B. Tech. Semes	ter – V (Computer Science and Engg.	.)	
L	Т	Р	Credits	Class Work	:	25 Marks
-	-	4	2	Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. Implementation of basic constructs of Python programming language.
- 2. Familiarize with the strings and inbuilt functions.
- 3. Retrieval operations on data using lists, dictionaries, tuples and sets.
- 4. Learning the usage of regular expressions and built-in functions to navigate the file system.

.

5. To implement Object-oriented Programming concepts in Python.

The students should do the following:

- 1. Application of various control flow constructs
- 2. To learn application of various string handling functions.
- 3. Introduction Regular expression with operations
- 4. Implantation of List and various operations on it
- 5. Implementation of Array & its operations using Numpy package.
- 6. Implementation of Dictionary with operations.
- 7. Implementation of User Defined functions in Python
- 8. Implementation of Exception Handling concepts
- 9. Implementation of File handling operations
- 10. Implementation of object oriented features: Class & Instances
- 11. Introduction to Series in Python Pandas library
- 12. Introduction to Dataframes with basic operations.

Text / Reference Books

- 1. Gowrishankar S, Veena A, "Introduction to Python Programming", 1st Edition, CRC Press, Taylor & Francis, 2018. ISBN-13: 978-0815394372
- 2. Chun, J Wesley, Core Python Programming, Second Edition, Pearson, 2007 Reprint 2010.
- 3. Jake VanderPlas, "Python Data Science Handbook: Essential Tools for Working with Data", 1st Edition, O'Reilly Media, 2016. ISBN-13: 978-1491912058
- 4. Wesley J Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education India, 2015. ISBN-13: 978-9332555365
- 5. Miguel Grinberg, "Flask Web Development: Developing Web Applications with Python", 2nd Edition, O'Reilly Media, 2018. ISBN-13: 978-1491991732

Course Outcomes:

At the end of this course students will be able to:

1. Implement constructs, strings and inbuilt functions in Python.

- 2. Retrieve data using lists, dictionaries, tuples and sets.
- 3. Navigate file system using regular expression and built in functions.
- 4. Use Object-oriented Programming concepts in Python

CSE302C COMPILER DESIGN

	B. Tech. Semester – VI (Computer Science and Engg.)										
L	Т	Р	Credits	Class Work	:	25 Marks					
3	0		3	Examination	:	75Marks					
				Total	:	100 Marks					
				Duration of Examination	:	3 Hours					

Course Objectives:

- 1. Apply the knowledge of lex tool & yacc tool to develop a scanner & parser.
- 2. Design and conduct experiments for Intermediate Code Generation in compiler.
- 3. Develop program to solve complex problems in compiler
- 4. Learn the new code optimization techniques to improve the performance of a program in terms of speed and space.

UNIT-I

Introduction: Compilers and translators need of translators, structure of compiler: its different phases, Compiler construction tools.

Lexical Analysis: Role of lexical analyzer; Design of lexical analyzer; Regular expressions ;Specification and recognition of tokens; Input buffering; Finite automata; Conversion from regular expression to finite automata, and vice versa; Minimizing the number of states of DFA, Implementation of lexical analyzer.

UNIT-II

Syntactic Techniques & Parsing: Context free Grammars; Derivations & parse trees; Capabilities of CFGs; Role of parsers, Shift- Reduce Parsing; Operator precedence parsing; top down parsing; predictive parsing, LR parsers; LR(0) items SLR, LALR and Canonical LR parser.

UNIT-III

Syntax Directed Translation , Symbol Table & Error Handling : Syntax directed definition, construction of syntax trees, syntax directed translation scheme, implementation of syntax directed translation, Intermediate Code ;Parse trees & Syntax trees; Three address code, quadruples and triples; Translation of Boolean Expressions. Symbol tables, its contents and data structure for symbol tables; trees, arrays, linked lists, hash tables ; Operations on symbol table; Errors(lexical phase error, syntactic phase error, semantic error).

UNIT-IV

Code Optimization & Code Generation: Sources of code optimization; Loop optimization (Denominators, Reducible flow graphs, depth first search, loop invariant computation, Induction variable elimination); Directed acyclic representation of basic blocks Code generation, forms of objects code, machine dependent code, register allocation for temporary and user defined variables; Problems in code generation; Peephole optimization.

TEXT / REFERENCE BOOKS:

- 1. Compilers Principle, Techniques & Tools Alfread V. AHO, Ravi Sethi& J.D. Ullman; 1998Addison Wesley.
- 2. Theory and practice of compiler writing, Tremblay & Sorenson, 1985, Mc. Graw Hill.
- 3. System Software by Dhamdhare, 1986, MGH.
- 4. Principles of Compiler Design, Alfred V Aho, Jeffery D. Ullman, Narosa Publication

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

- 1. Students will get the concepts of Compilers and the actual roles of the lexical analyzer
- **2.** Students will get the concepts of different Parsing techniques and Construction of syntax trees
- 3. Students will get the concepts of Type checking and Run time environments
- **4.** Students will get the concepts of Intermediate code generation, Code optimization and Code generations.

CSE324C MOBILE APPLICATIONS DEVELOPMENT

			B. Tech. Semest	er – VI (Computer Science and Engg	j.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To understand the basics of mobile computing devices and applications types.
- 2. To understand the mobile communication mechanisms.
- 3. To understand the communication mechanisms via Web
- 4. To understand the designing mechanisms of mobile applications for different platforms.

UNIT-I

Introduction to Mobile Application Development: Definition of mobile computing, various types of mobile computing devices (mobile computers, smart phones and dedicated devices). Web based applications, Native applications and Compare and contrast web-based mobile applications against native applications, history of mobile platforms (PDA's, Notebooks, Smartphones. Internet protocols for mobile applications i.e. WAP), evolution of browsers and Internet languages such as HTML and JavaScript.

UNIT-II

Infrastructure: Describe mobile and cell phone technologies (CDMA, GSM, 3G, 4G), Compare and contrast 3G and 4G, Internet terms: IP address, subnet mask, gateway, DNS, static vs Dynamic IP, transport including HTTP, routing, secure connections, proxies and reverse proxies. Need for storage, local Storage, storage on Web.

UNIT-III

HTML/CSS/DOM and Scripting: Basic HTML: validation, rendering and web browser, Cascading Style Sheets (CSS) and how to use them, document object model (DOM): document, objects, model, DOM tree and DOM's utilization in web design, basic JavaScript code and constructs of the JavaScript language.

UNIT-IV

Designing mobile user interfaces and Mobile Platforms: Design mobile interfaces, usability, ways to test user interfaces, various types of user interfaces for mobile apps: Interactive voice response (IVR), SMS/MMS, Mobile web, Native applications, Hybrids, mobile application development design considerations: Text entry, screen size, user interface and user context. Mobile Platforms: URIs for mobile apps, Compare and contrast native mobile platforms such as tightly controlled (IPhone), open (Android), and licensed (Windows Mobile), web as a mobile application platform.

Text Book:

Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)

Reference Books:

- 1. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd (2011)
- 2. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd(2009)
- 3. Sayed Y Hashimi and Satya Komatineni, "Pro Android", Wiley India Pvt Ltd(2009)

4. Brian Fling, "Mobile Design and Development: Practical concepts and techniques for creating mobile sites and web

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

- 1. Have an understanding of mobile computing devices and applications types for designing the simple mobile applications.
- 2. Have an ability to identify the need of mobile communication mechanisms.
- 3. Have an understanding of communication mechanisms via Web
- 4. Have the knowledge for designing mechanisms of mobile applications for different platforms.

CSE326C DIGITAL IMAGE PROCESSING

	B. Tech. Semester – V (Computer Science and Engg.)										
L	Т	Р	Credits	Class Work	:	25 Marks					
3	0		3	Examination	:	75Marks					
				Total	:	100 Marks					
				Duration of Examination	:	3 Hours					
				Duration of Examination	•						

Course Objectives:

- 1. To learn and understand the fundamentals of digital image processing.
- 2. To learn and understand various image Transforms.
- 3. To learn and understand Image Enhancement Techniques.
- 4. To learn image restoration Techniques and methods, image compression and Segmentation used in digital image processing.

UNIT- I

Digital Image Fundamental: - Elements of visual perception, image sensing and acquisition, image sampling and quantization, basic relationships between pixels – neighborhood, adjacency, connectivity, distance measures.

UNIT- II

Image Enhancements, Filtering And Restoration:- Enhancement in spatial domain; pixel grey level transformation, image negatives, logarithmic transformation; bit-plane slicing, histogram processing; enhancement in frequency domain; image smoothing (low pass filter), image sharpening (high pass filter), selective filtering (band pass and band reject filters); noise models for images, signal-to-noise ratio, image restoration in the presence of noise using spatial filtering, periodic noise reduction by frequency domain filtering; estimating the degradation function, inverse filtering.

UNIT- III

Color Image Processing & Image Segmentation:- Color fundamentals, color models, RGB, CMY and CMYK color models, HSI model; pseudocolor image processing, basics of full color processing, color transformations, smoothing and sharpening; noise in color images, grey level to color transformation; Image Segmentation: fundamentals, edge-based segmentation; image thresholding, intensity thresholding; basic global thresholding, multi-variable thresholding.

UNIT- IV

Image Compression:- Redundancy–inter-pixel and psycho-visual; Loss less compression – predictive, entropy; Lossy compression- predictive and transform coding; Discrete Cosine Transform; Still image compression standards – JPEG and JPEG-2000.

TEXT AND REFERENCE BOOKS:

1. R.C. Gonzalez and R.E. Woods, Digital Image Processing, Second Edition, Pearson Education 3rd edition 2008.

2. Anil Kumar Jain, Fundamentals of Digital Image Processing, Prentice Hall of India.2nd edition 2004.

3. Murat Tekalp , Digital Video Processing'' Prentice Hall, 2nd edition 2015

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

At the end of the course, students will demonstrate the ability to:

- 1. Represent various types of images and analyze them.
- 2. Process these images for the enhancement of certain properties or for optimized use of the resources.
- 3. Work with colored images and perform image segmentation.
- 4. Develop algorithms for image compression and coding.

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat) SCHEME OF STUDIES & EXAMINATIONS B.Tech. 3rd YEAR (SEMESTER –VI) COMPUTER SCIENCE AND ENGINEERING Choice Based Credit System Scheme of Studies & Examinations w.e.f. 2020-21

SI.	Course	Course Title	Teach	ning		Marks	Examin	ation	Total	Credits	Duration
No.	Code		Schee	lule		of Class	Marks				of Exam
			L	Т	Р	work	Theory Pract				
								ical			
1.	CSE302C	Compiler Design	3	0	0	25	75	0	100	_ 3	3
2.	PEC-II	Program Elective-II	3	0	0	25	75	0	100	3	3
3.	PEC-III	Program Elective-III	3	0	0	25	75	0	100	3	3
4.	OEC-I	Open Elective-I	3	0	0	25	75	0	100	3	3
5.	OEC-II	Open Elective-II (Humanities)	3	0	0	25	75	0	100	3	3
6.	CSE382C	Compiler Design Lab	0	0	4	25	0	75	100	2	3
7.	PEC-II Lab	Program Elective-II Lab	0	0	4	25	0	75	100	2	3
		Total	15	0	8	175	375	150	700	19	21

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

			SEM	IEST	ER-V	/I						
Sl. No.	Course Code	Course Title	T S L	'eachi chedu T	ng ile P	Marks of Class work	Examin Man Theory	nation rks Practi cal	Total	Credits	Duration of Exam	
	B.Tech. (Hons.) in CSE with specialization in Blockchain (H1)											
1.	CSEH302C	Cryptocurrency with Ethereum	3	0	0	25	75	0	100	3	3	
2.	CSEH382C	Cryptocurrency with Ethereum Lab	0	0	4	25	0	75	100	2	3	
3.	CSEH304C	Foundations of Blockchain Technology	3	0	0	25	75	0	100	3	3	
	B.Tech. (Hons.) in CSE with specialization in Cyber Security (H2)											
1.	CSEH306C	Information Security and Data Hiding	3	0	0	25	75	0	100	3	3	
2.	CSEH386C	Information Security and Data Hiding Lab	0	0	4	25	0	75	100	2	3	
3.	CSEH308C	Mobile and Smart Forensics	3	0	0	25	75	0	100	3	3	
	B	B.Tech. (Hons.) in CSE v	vith	speci	aliza	tion in	Data S	Science	e (H3)			
1.	CSEH310C	Data Analytics with Python	3	0	0	25	75	0	100	3	3	
2.	CSEH390C	Data Analytics with Python Lab	0	0	4	25	0	75	100	2	3	
3.	CSEH312C	Data Mining	3	0	0	25	75	0	100	3	3	
	Total	(H1/H2/H3)	6	0	4	75	150	75	300	8	9	
Program Elective-II

Course	Course Title	Course	Course Title	
Code		Code		
CSE324C	Mobile Applications Development	CSE330C	IoT Architecture & Protocols ⁴	
CSE326C	Digital Image Processing	CSEH306C	Information Security and Data Hiding ²	
CSE328C	Advanced Java	CSEH310C	Data Analytics with Python ³	

Program Elective-II Lab

Course	Course Title	Course	Course Title
Code		Code	
CSE384C	Mobile Applications Development	CSE390C	IoT Architecture & Protocols Lab
	Lab		
CSE386C	Digital Image Processing Lab	CSEH386C	Information Security and Data Hiding
			Lab ²
CSE388C	Advanced Java Lab	CSEH390C	Data Analytics with Python Lab ³

Program Elective-III

Course Code	Course Title	Course Code	Course Title
CSE340C	Artificial Intelligence and Expert System	CSEH304C	Foundations of Blockchain Technology ¹
CSE342C	Advanced Computer Networks	CSEH312C	Data Mining ³
CSE344C	Software Testing		

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 ⁴Not to be opted by B.Tech(Hons) students opting specialization in IoT

NOTE:

- 1. Students will be permitted to opt for any one elective each from the list of Program Elective-II and Program Elective-III. The minimum strength of the students should be 20 to run an elective course.
- 2. The student pursuing B.Tech (Hons.) will choose subjects as per the specialization opted in the V semester.
- 3. The students pursuing B.Tech (Hons.) can choose one subject each from the list of Program Elective II and Program Elective –III except already opted as per the specialization (Blockchain (H1), Cyber security (H2) and Data Science (H3)). The students should choose different subjects.
- 4. Each student has to undergo Professional Training (Level-3) of at least 4 weeks from the industry, institute, research lab, training centre etc. during summer vacation and its evaluation shall be carried out in the VII semester.
- 5. Students will be permitted to opt for one elective each from the list of Open Elective-I and Open Elective-II that are run by other departments. The minimum strength of the students should be 20 to run an elective course.
- 6. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculators will not be permitted in the examinations.

OPEN ELECTIVES

		Open Elective-I	Open Elective-II				
S.No	Course No.	Course Title	S.No	Course No.	Course Title		
1.	HUM350C	Communication Skills for	1.	CSE305C	Computer Networks		
		Professionals (Except BME & BTE)					
2.	HUM352C	Soft Skills And Interpersonal Communication	2.	CSE431C	Cyber Security		
3.	MGT402C	Human Values, Ethics And IPR	3.	CHE457C	Industrial Safety		
4.	MGT404C	Human Resource Management	4.	CE406C	Disaster Management		
5.	HUM354C	Introduction To French Language	5.	ECE327C	Consumer Electronics		
6.	HUM356C	Introduction To German Language					

			CSI	E328C ADVANCED JAVA		
			B. Tech. Semes	ster – VI (Computer Science and Eng	g.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To study the fundamental concepts of programming in Java including the designing of interactive applications.
- 2. To learn the concepts of connecting with databases.
- 3. To gain the insights of servlet concept.
- 4. To understand the fundamental concepts of JSP.

UNIT-I

Introduction: Concepts of Classes and Objects, Constructors, Inheritance, Function Overloading, Polymorphism, Packages and Interfaces, exception handling, file streams and their manipulation. AWT & Applet Programming Design of User Interfaces: Swing, Japplet, Icons and Labels, Text Fields, Buttons, Jbutton Class, Check Box, Radio Buttons, The Container, Panel, Windows, and Frame Classes, Combo Box, Tabbed Panes, Scroll Panes, Trees, Tables, Custom Rendering of Jlist Cells.

UNIT-II

JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, working with statements, Creating and Executing SQL statements, working with Result Set Object & Result Set Meta Data. Java Beans: Java Bean, Installing, Starting Bean Development Kit, Use of JAR files and the use of Java Beans API.

UNIT-III

Servlets: Introduction to Servlets, Life cycle of Servlets, Creating, Compiling and running servlet, Reading the servlet Parameters, Reading Initialization parameter, Packagesjavax.servletPackage, Handling HTTP Request and Response (GET / POST Request), Cookies and Session Tracking.

UNIT-IV

JSP: JSP Architecture, JSP Access Mode, JSP Syntax Basic (Directions, Declarations, Expression, Scriplets and Comments, JSP Implicit Object, Object Scope, Synchronization Issue, Session Management.

Text/Reference Books:

1. Gary Cornell and Horstmann Cay S., Core Java, Vol I and Vol II, Sun Microsystems Press.

2. Herbert Schildt, Java: The Complete Reference, McGraw-Hill.

3. Philip Hanna, JSP: The Complete Reference, McGraw-Hill.

4. Deital and Deital, Java How to Program, Prentice Hall (2007).

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

- 1. Have an ability to apply the core Java concepts for designing applications.
- 2. Have an ability to use the Java concepts for accessing a database.
- 3. Have an ability to understand the utility of server side technologies.
- 4. Have basic understanding and knowledge of JSP.

			CSE330C	IoT ARCHITECTURE & PROTOCOL	S	
			B. Tech. Ser	nester – VI (Computer Science and Engg	g.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To understand the basics of IoT.
- 2. To learn IoT Architecture and enabling technologies
- 3. To know about IoT protocols at different layers
- 4. To know about the application areas of IoT

UNIT- I

Introduction to IoT:- Introduction to IoT, Market Trends, Opportunities in IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT: Functional blocks of IoT, Difference between IoT and M2M, Software defined Network(SDN) for IoT, Network Function Virtualization(NFV) for IoT, Data Handling and Analytics, Challenges in IoT(Design, Development, Security). An IoT Security Framework,SDN and NFV over IoT Deployment, IoT entities---Sensors,actuators,gateway,cloud,Mobile/web apps.

UNIT- II

IOT Architecture And enabling technologies-

IoT Architecture:- IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations, IoT communication Architecture, IoT Communication models & APIs, Reference Model- IoT reference Model, IoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, SOA based Architecture, API-based Architecture, OPENIoT Architecture for IoT/Cloud Convergence..

IOT Enabling Technologies:-

Introduction to Big Data Analytic, Embedded Systems, Cloud Computing-Cloud Service Management and IOT - Connecting IOT to cloud – Cloud Storage for Iot ,Wireless Sensor Networks- Industrial sensors, Integrated IoT Sensors, Sensors' Swarm

UNIT-III

IoT protocols:-Wireless communication protocols: Wifi, IPV4/IPV6, 6LOWPAN, ZigBee(IEEE802.15.4), Bluetooth, Bluetooth Low Energy(BLE)

Application layer protocols: MQTT/MQTTS, CoAP, REST/HTTP,XMPP,SCADA Authentication Protocols; IEEE 802.15.4., comparison of the different IoT protocols, advantages and disadvantages (limitations) of these IoT protocols.

UNIT-IV

Applications of IoT And Research Perspective:- IoT Strategic Research and Innovation Directions, Domain specific applications of IoT, Home automation, Surveillance applications,

40

Industrial IoT,IoT in Energy, IoT in Healthcare, Internet of Robotic Things, Green IoT, home, infrastructures, buildings, security, Industries, Home appliances,Internet of Nano Things,IoT application in Drones, Internet of Vehicles(IoV),Internet of Everything(IoE) **TEXT/REFERENCES:**

- 1. Vijay Madisetti, Arshdeep Bahga, "Internet of Things: A Hands-OnApproach"
- 2. Waltenegus Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice"
- 3. Cuno Pfister, Getting Started with the Internet of Things, O"Reilly Media, 2011, ISBN: 978-1-4493- 9357-1.
- 4. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry, "IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things", CISCO Press, 2017
- 5. Hersent, Olivier, David Boswarthick, and Omar Elloumi. The internet of things: Key applications and protocols. John Wiley & Sons, 2011.
- 6. Buyya, Rajkumar, and Amir Vahid Dastjerdi, eds. Internet of Things: Principles and paradigms. Elsevier, 2016.
- 7. Dr. Guillaume Girardin , Antoine Bonnabel, Dr. Eric Mounier, 'Technologies & Sensors for the Internet of Things Businesses & Market Trends 2014 2024', Yole Développement Copyrights ,2014
- 8. Editors OvidiuVermesan Peter Friess, 'Internet of Things From Research and Innovation to Market 4. 4.Deployment', River Publishers, 2014

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

On successful completion of the course, the student will:

- 1. Comprehend the essentials of IoT
- 2. Understand IoT Architecture & enabling technologies
- 3. Understand various IoT protocols
- 4. Understand IoT applications in different domain and be able to analyze their performance.

CSEH306C INFORMATION SECURITY AND DATA HIDING

B. Tech. Semester – VI (Computer Science and Engg.)

L	Т	Р	Credits	Class Work		:	25 Marks
3	0		3	Examination		:	75 Marks
				Total		:	100 Marks
				Duration	of	:	3 Hours
				Examination			

Course Objectives:

1. To learn about data hiding applications and their techniques.

- 2. To learn about hacking.
- 3. To learn security based protocols, attacks and intrusions.
- 4. To work with advance data hiding techniques.

UNIT- I

Introduction: - The need for security, security approach, principles of security, types of attack, denial of service, IP spoofing, Phishing. Digital signature, Firewall.

UNIT- II

Hacking: Basics, Email hacking, computer hacking, types of hacking, practice against hacking, Access Authorization, Compression, LZW Compression and Decompression Method.

UNIT-III

Data hiding:- Terms related to data hiding, Differences between cryptography, stenography & watermarking, history of stenography. Applications of data hiding.

UNIT-IV

Advance data hiding techniques :- Transform domain, difference between special domains and transform domain, wavelets, advantages of wavelet, and wavelet based techniques for data hidings.

TEXT REFERENCE BOOKS:

- 1. Cryptography and Network Security by Atul Khat e, Mc Graw Hill Publisher
- 2. E-mail Hacking by Ankit Fadia, Vikash Publishers
- 3. Data communication and Networking, Behrouz A. Forouzan.

Note:

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

3. 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:

- 1. Explain information security.
- 2. Give an overview of access control of relational databases.
- 3. State the basic concept in information systems security, including security technology and principles, software security and trusted systems and IT security management.
- 4. Learn advance data hiding techniques.

CSEH310C DATA ANALYTICS WITH PYTHON

		B. Te	ch. Semester –	VII (Computer Science and E	ngg.	.)
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To get the students familiar about the Concepts of Descriptive Statics through tests.
- 2. To study the concepts of Inferential Statistics and ANOVA.
- 3. To study in detail the techniques and history of Data Visualization.
- 4. To study the basic and concepts of Big Data Analytics, Data Mining and Clustering.

UNIT-I

Descriptive Statistics:- Statistical Analysis of Data, Descriptive Statistics, Frequency Distributions, Histograms, Histograms, Shapes of Distributions, Measures of Central Tendency Computing the Mean, Measuring Variability, Measures of Relationship, Reliability Indices, Standard Scores (Z-scores), Inferential Statistics, Populations and Samples, Sampling Techniques.

UNIT-II

Inferential Statistics:- Hypothesis testing, chi square test and T-test, Statistical decisions, Statistical decision process, Testing for mean differences, statistical versus practical significance, Effect of sample size, Regression (single).

UNIT-III

Data Visualization: Data Visualization: Meaning and significance, Traits of Meaningfull Data, Brief History of Information Visualization, Power of visual perception, Making abstract data Visible, Building Blocks of information Visualization, Analytical Techniques.

UNIT-IV

Big Data, Data Mining & Clustering:- Big Data, In-memory processing, limitations of Inmemory processing, Data mining process along-with techniques, Tools and platforms for data mining, Clustering and its techniques (K-means, Agglomerative, Hierarchical clustering, and DBSCAN).

TEXT/ REFERENCES BOOKS:

- 1. Prem S. Mann, "Introductory Statics," Wiley.
- 2. Anil Maheshwari, "Data Analytics," Mcgraw Hill.
- 3. Hastie, Trevor et al. The elements of statistical learning. Vol. 2. No. 1. New York: springer, 2009.
- 4. Montgomery, Douglas C., and George C. Runger, "Applied statistics and probability for engineers" John Wiley & Sons, 2010.
- 5. Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer, 2007.

6. Pang-Ning Tan et al, "Introduction to Data Mining," Pearson.

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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 completion of the course:

- 1. Students will be able to understand the Statistical analysis methods.
- 2. Students will be able to understand the Inferential Statistics and ANOVA.
- 3. Students will be able to understand the details of Data Visualization.

4. Students will be able to understand the concepts of Big Data Analytics, Data Mining and Clustering.

	C	SE3400	C ARTIFICIAL	L INTELLIGENCE AND EXPERT S	SYSTEM	
		I	3. Tech. Semeste	r – VI (Computer Science and Engg.))	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To understand the basic concepts of AI and problem solving
- 2. To analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search techniques to solve them
- 3. To represent knowledge and draw inferences
- 4. To explore learning techniques and existing expert systems

UNIT- I

Introduction: The AI problems; what is an AI technique; Characteristics of AI applications Problem Solving, Search and Control Strategies General Problem solving; Production systems; Control strategies: forward and backward chaining Exhaustive searches: Depth first Breadth first search.

UNIT- II

Heuristic Search Techniques: Hill climbing; Branch and Bound technique; Best first search and A* algorithm; AND/OR Graphs; Problem reduction and AO* algorithm; Constraint Satisfaction problems Game Playing Minmax search procedure; Alpha-Beta cutoffs; Additional Refinements

UNIT- III

Knowledge Representation & Reasoning:- Propositional logic, First order predicate logic, Inference in FOPL, Skolemnisation; Resolution Principle and Unification; Forward & Backward chaining, Inference Mechanisms Horn's Clauses; Semantic Networks; Frame Systems and Value Inheritance; Conceptual Dependency

UNIT- IV

Learning Techniques: - Supervised and unsupervised learning, Decision trees, Statistical learning models, Reinforcement learning.

Expert Systems: Introduction to Expert Systems, Architecture of Expert Systems; Expert System Shells; Knowledge Acquisition; Case Studies: MYCIN, Learning, Rote Learning; Learning by Induction; Explanation based learning.

TEXT/REFERENCES BOOKS:

- 1. Elaine Rich and Kevin Knight: Artificial Intelligence- Tata McGraw Hill.
- 2. Dan W.Patterson, Introduction to Artificial Intelligence and Expert Systems- Prentice Hall of India.

- 3. Nils J.Nilsson: Principles of Artificial Intelligence- Narosa Publishing house.
- 4. Artificial Intelligence : A Modern Approach, Stuart Rusell, Peter Norvig, Pearson Education
- 5. Artificial Intelligence, Winston, Patrick, Henry, Pearson Education

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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 completion of course, students would be able to:

- 1. Analyze and formalize problem and solve them using AI techniques
- 2. Use Heuristic search techniques for game playing and other problems
- 3. Represent diverse knowledge using AI and analyze
- 4. Understand and design an expert system

			B. Tech. Semest	er – VI (Computer Science and Engg	g.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

CSE342C ADVANCED COMPUTER NETWORKS

Course Objectives:

- 1. To educate concepts, vocabulary and techniques currently used in the area of computer networks.
- 2. To master the terminology and concepts of socket programming.
- 3. To be familiar with wireless networking concepts
- 4. To be familiar with contemporary security issues in networking technologies.

UNIT-I

Binding Protocol Address: Address Resolution Protocol & RARP, ARP & RARP, packet format, Encapsulation. Internet protocol: Introduction, Ipv4 header, Ipv4Datagrams, Encapsulation, Fragmentation and Reassembly, IP routing, Subnet addressing, Subnet mask, Supernetting-special case of IP addresses IPv6-Motivation, frame format and addressing, comparison of IPv4 and IPv6.

UNIT-II

Socket Programming: Creating sockets, Posix data type, Socket addresses, Assigning address to a socket, Java socket programming, Thread programming, Berkeley Sockets: Overview, socket address structures, byte manipulation & address conversion functions, elementary socket system calls –socket, connect, bind, listen, accept, fork, exec, close, TCP ports (ephemeral, reserved), Berkeley Sockets: I/O asynchronous & multiplexing models, select & poll functions, signal & fcntl functions, socket implementation (client & server programs), UNIX domain protocols.

UNIT-III

GSM Overview, GSM Network signaling, GSM Mobility Management, GSM Short Message Service, Mobile Number portability General Packet Radio Service: Functional Groups, Architecture, GPRS Network nodes and Interfaces, Introductory ideas about WAP.

UNIT-IV

Network Security Practice: Authentication Applications- Kerberos, X.509 Authentication Service; Electronic Mail Security-Pretty Good Privacy, S/MIME; IP Security- IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations; Web Security-Web Security Considerations, Secure Sockets Layer and Transport Layer Security, Secure Electronic Transaction.

TEXT/REFERENCE BOOKS

1. Jawin, "Networks Protocols Handbook", Jawin Technologies Inc., 2005.

- 2. Bruce Potter and Bob Fleck, "802.11 Security", O'Reilly Publications, 2002.
- 3. Ralph Oppliger "SSL and TSL: Theory and Practice", Arttech House, 2009.

4. Forouzen, Data Communication and Networking, TMH

5. Behrouz A.Forouzan, TCP/IP Protocol Suite

6. William Stalling, Network Security Essentials, 2nd Edition. PHI New Delh Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

- 1. Have an understanding of the concepts, vocabulary and techniques currently used in the area of computer networks.
- 2. Have an ability of terminologies and concepts of socket programming.
- 3. Have knowledge of wireless networking concepts.
- 4. Have the understanding of contemporary security issues in networking technologies.

			0010-			
			B. Tech. Semest	er – VI (Computer Science and Engg	;.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

CSF344C SOFTWARE TESTING

Course Objectives:

- 1. To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
- 2. To learn how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.
- 3. To expose the advanced software testing topics, such as object-oriented software testing methods, and component-based software testing issues, challenges, and solutions.
- 4. To gain the techniques and skills on how to use modern software testing tools to support software testing projects.

UNIT- I

Introduction:- What is software testing and why it is so hard?, Error, Fault, Failure, Incident, Test Cases, Testing Process, Limitations of Testing, No absolute proof of correctness, Overview of Graph Theory.

Functional Testing:- Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique.

UNIT-II

Structural Testing: Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing.

Testing Activities:- Unit Testing, Levels of Testing, Integration Testing, System Testing, Debugging, DomainTesting.

UNIT-III

Reducing the number of test cases:- Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing, and Slice based testing.

Object Oriented Testing: Issues in Object Oriented Testing, Class Testing, GUI Testing, Object Oriented Integration and System Testing.

UNIT-IV

Testing Tools: Static Testing Tools, Dynamic Testing Tools, and Characteristics of Modern Tools and Implementation with example. Advanced topics in software testing: web based testing, Client server testing, Automated test cases generation, Regular expression and FSM based testing.

TEXT/ REFERENCE BOOKS:

- 1. William Perry, Effective Methods for Software Testing , John Wiley & Sons, New York, 1995.
- 2. Cem Kaner, Jack Falk, Nguyen Quoc, Testing Computer Software, Second Edition, Van Nostrand Reinhold, New York, 1993.
- 3. Boris Beizer, Software Testing Techniques , Second Volume, Second Edition, Van Nostrand Reinhold, New York, 1990.
- 4. Louise Tamres, Software Testing, Pearson Education Asia, 2002
- 5. Roger S. Pressman, Software Engineering A Practitioner's Approach , Fifth Edition, McGraw-Hill International Edition, New Delhi, 2001.
- 6. Boris Beizer, Black-Box Testing Techniques for Functional Testing of Software and Systems , John Wiley & Sons Inc., New York, 1995.
- 7. K.K. Aggarwal & Yogesh Singh, Software Engineering, New Age International Publishers, New Delhi, 2003.
- 8. Marc Roper, Software Testing, McGraw-Hill Book Co., London, 1994.
- 9. Gordon Schulmeyer, Zero Defect Software , McGraw-Hill, New York, 1990.
- 10. Watts Humphrey, Managing the Software Process, Addison Wesley Pub. Co. Inc., Massachusetts, 1989.

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

- 1. Have an ability to apply software testing knowledge and engineering methods and design and conduct a software test process for a software testing project.
- 2. Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation.
- 3. Have an ability to use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects.
- 4. Have basic understanding and knowledge of contemporary issues in software testing, such as component-based software testing problems

CSEH304C FOUNDATIONS OF BLOCKCHAIN TECHNOLOGY

			B. Tech. Semester	r – VI (Computer Science and Engg.)		
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To introduce basic concepts of Blockchain.
- 2. To understand abstract models for Blockchain technology
- 3. To learn about usage of Blockchain technology in financial services.
- 4. To visualize the scope of blockchain & its role in futuristic development.

Introduction to Blockchain:- Overview of blockchain, need for blockchain, history of centralized services, trusted third party, Distributed consensus in open environments, Distributed Vs Decentralized Network, 51 % attack theory, Public blockchains, Private blockchains, Blockchain Architecture and working, Mining, Limitations of blockchain, Applications of blockchain

UNIT-II

Models for blockchain:- GARAY model, RLA Model, Proof of Work (PoW), HashcashPoW, PoW Attacks and the monopoly problem, Proof of Stake(PoS), hybrid models(PoW+PoS), Proof of Burn and Proof of Elapsed Time.

UNIT- III

Permissioned Blockchain:- Permissioned model and use cases, Design issues for Permissioned blockchains, State machine replication, Consensus models for permissioned blockchain, Distributed consensus in closed environment, Paxos, RAFT Consensus, Byzantine general problem, Byzantine fault tolerant system, Lamport-Shostak-Pease BFT Algorithm, BFT over Asynchronous systems.

UNIT-IV

Blockchain in Financial Service:- Digital Currency, Cross border payments, Steller and Ripple protocols, Project Ubin, Know Your Customer (KYC), Privacy Consents, Mortgage over Blockchain, Blockchain enabled Trade, We Trade – Trade Finance Network, Supply Chain Financing, Insurance.

Blockchain Security: Security properties, Security considerations for Blockchain, Intel SGX, Identities and Policies, Membership and Access Control, Blockchain Crypto Service Providers, Privacy in a Blockchain System, Privacy through Fabric Channels, Smart Contract Confidentiality.

TEXT/REFERENCES BOOKS:

- 1. Blockchain: Blueprint for a New Economy, by Melanie Swan.
- 2. Blockchain: The blockchain for beginners guide to blockchain technology and leveraging blockchain programming, by Josh Thompsons
- 3. Blockchain Basics by Daniel Drescher, Apres

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

At the end of the course, students will develop understanding for:

- 1. Recognizing goals of Blockchain.
- 2. Smart Contracts, transactions in Blockchain and Permissioned Blockchain.
- 3. Analyzing usage of Blockchain in finance.
- 4. Security issues in Blockchain.

CSEH302C CRYPTOCURRENCY WITH ETHEREUM

			B. Tech. Semester –	- VI (Computer Science and Engg.)		
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To introduce the concepts of cryptocurrency.
- 2. To understand working of Bitcoin and Ethereum
- 3. To study the security issues and safeguards related to bitcoin trading
- 4. To study governing cryptocurrency regulations and its impact on economy.

UNIT- I

Cryptocurrency:- History, Distributed Ledger Technology (DLT), cryptocurrency in blockchain, Cryptographic basics for cryptocurrency: overview of Hashing, signature schemes, encryption schemes and elliptic curve cryptography

UNIT-II

Bitcoin:- Creation of coins, Wallet, Genesis Block, Merkel Tree, Bitcoin Scripts, Bitcoin P2P Network, hardness of mining, Transaction in Bitcoin Network, transaction verifiability, anonymity, forks, payments and double spending, Consensus in a Bitcoin network, mathematical analysis of properties of Bitcoin, Bitcoin protocols – Bitcoin Mining strategy and rewards, life of a Bitcoin Miner, Mining Difficulty, Mining Pool.

UNIT-III

Ethereum:- Ethereum Virtual Machine (EVM), Wallets for Ethereum, Ethereum Programming Language: Solidity, Smart Contracts, The turing completeness of smart contract languages, attacks on smart contracts, Ethereum Construction, DAO, GHOST, Vulnerability, Attacks, Sidechain: another type of blockchain, Namecoin

UNIT- IV

Cryptocurrency Regulation:- Stakeholders, Roots of Bitcoin, Bitcoin scripting vs Ethereum smart contracts, Legal Aspects - Cryptocurrency Exchange, Black Market and Global Economy, Global Acceptability perspective

TEXT/REFERENCES BOOKS/ARTICLES

- **1.** Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction by Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Princeton University Press (July 19, 2016).
- 2. Mastering Bitcoin: Unlocking Digital Cryptocurrencies by Antonopoulos
- 3. Bitcoin: A Peer-to-Peer Electronic Cash System by Satoshi Nakamoto
- 4. ETHEREUM: A Secure Decentralized Transaction Ledger by Gavin Wood, Yellow paper.2014.
- 5. A survey of attacks on Ethereum smart contracts by Nicola Atzei, Massimo Bartoletti, and Tiziana Cimoli

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

At the end of the course, students will develop understanding for:

- 1. Cryptocurrency : Bitcoin and Ethereum
- 2. Building efficient blockchain models to carry out tasks with the practical approach.
- 3. Evaluating the use and risks involved with cryptocurrency
- 4. Smart contracts and their implications.

CSEH308C MOBILE AND SMART PHONE FORENSICS

		в.	Tech. Semester -	- VI (Computer Science	e and	Engg.)	
L	Т	Р	Credits	Class Work		:	25 Marks
3	0		3	Examination		:	75Marks
				Total		:	100 Marks
				Duration	of	:	3 Hours
				Examination			

Course Objectives:

- 1. To understand mobile device forensics.
- 2. To learn different types of digital evidence.
- 3. To gain knowledge of different system like and roid and ios.
- 4. To understand mobile file system & data structures.

UNIT- I

Mobile Forensic:- Cell phone and mobile device forensics, Understanding Mobile device forensics, Understanding acquisition procedure ,Cell phone Crimes, SIM Architecture, Data Storage, Data Extraction, Files Stored on SIM, Mobile Operating System.

UNIT-II

Digital Evidence:- Mobile Device Forensics, Types of Evidence on Mobile Devices, Handling Mobile Devices as Sources of Evidence, Forensic Preservation of Mobile Devices, Forensic Examination and Analysis of Mobile Devices, Forensic Acquisition and Examination of SIM Cards, Investigative Reconstruction Using Mobile Devices Future Trends.

UNIT-III

Andriod and IOS Systems:- Architecture, Differentiation, Technological Composition, Introduction to Andriod Platform, Introduction to IOS Platform.

UNIT-IV

Mobile File Systems and Data Structures:- Introduction, What and How of Data, Types of Memory, File Systems, Rootfs, devpts, sysfs, cgroup, yaffs2, Procedure for handling an Andriod Devices, Logical Techniques VS Digital Techniques, Introduction to Mobile Malware.

TEXT/REFERENCES BOOKS:

- 4. Guide to Computer Forensics and Investigations By Bill Nelson, Amelia Phillips, Christopher Stuart.
- 5. Digital Evidence on Mobile Devices.
- 6. Digital Evidence and Computer Crime, Third Edition Eoghan Casey. Published by Elsevier Inc. All rights reserved.
- 7. Andriod Forensic, Investigation, and Security by Andrew Hogg, Publisher Synergy Security in Mobile Communication by Professor Noureddine Boudriga. Mobile Malware Attacks and Defense By Ken Dunham

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

At the end of the course, students will develop understanding for:

- 1. Mobile device forensics.
- 2. Different type of mobile file system & digital forensic.
- 3. Technological composition of android & ios systems.
- 4. Mobile file system & data structures.

CSEH312C DATA MINING

			B. Tech	. Semester – VI (Computer S	cience	and Engg.)
L	Т	Р	Credits	Class Work	:	25 Marks
3	0		3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To learn data mining and Data preprocessing concepts.
- 2. To know about the association rules in data mining.
- 3. To perform various Classification and clustering algorithms.
- 4. To understand the strengths and limitations of various data mining models.

UNIT – I

Introduction to Data Mining:- Introduction, What is Data Mining, Definition, KDD, Challenges, Data Mining Tasks, Data Preprocessing, Data Cleaning, Missing data, Dimensionality Reduction, Feature Subset Selection, Discretization and Binaryzation, Data Transformation; Measures of Similarity and Dissimilarity- Basics.

UNIT – II

Association Rules:- Problem Definition, Frequent Item Set Generation, Frequent Itemsets, Closed Itemsets, and Association Rules. Apriori Algorithm: Finding Frequent Itemsets by Confined Candidate Generation, Generating Association Rules from Frequent Itemsets, Improving the Efficiency of Apriori, A Pattern-Growth Approach for Mining Frequent Itemsets, Mining Frequent Itemsets Using Vertical Data Format, Mining Closed and Max Patterns.

UNIT – III

Classification:- Problem Definition, General Approaches to solving a classification problem , Evaluation of Classifiers , Classification techniques, Decision Trees-Decision tree Construction ,Naive-Bayes Classifier, Bayesian Belief Networks; K- Nearest neighbor classification-Algorithm and Characteristics.

Clustering: Problem Definition, Clustering Overview, Evaluation of Clustering Algorithms, Partitioning Clustering-K-Means Algorithm, PAM Algorithm, Hierarchical Clustering -Agglomerative Methods and divisive methods, Strengths and Weakness; Outlier Detection.

$\mathbf{UNIT} - \mathbf{IV}$

Web and Text Mining:- Introduction, web mining, web content mining, web structure mining, Text mining –unstructured text, episode rule discovery for texts, hierarchy of categories, text clustering.

TEXT/ REFERENCE BOOKS:

1. Data Mining- Concepts and Techniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2 Edition, 2006.

- 2. Introduction to Data Mining, Pang-Ning Tan, Vipin Kumar, Michael Steinbanch, PearsonEducation.
- 3. Data mining Techniques and Applications, Hongbo Du Cengage IndiaPublishing
- 4. Data Mining Techniques, Arun K Pujari, 3rd Edition, UniversitiesPress
- 5. Data Mining Principles & Applications T.V Sveresh Kumar, B. Esware Reddy, Jagadish S Kalimani, Elsevier.
- 6. Data Mining, Vikaram Pudi, P Radha Krishna, Oxford UniversityPress

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

- 1. Perform the preprocessing of data and apply mining techniques onit.
- 2. Identify the association rule applied on datasets.
- 3. Perform Classification and clustering algorithms
- 4. Classify web pages, extract knowledge from the Web.

Open Elective-I

(Common for All Branches except Bio Technology and Bio-Medical Engg for all Semesters)

HUM 350 C Communication Skills for Professionals

			B. Tech. Semester	– VI (Computer Science an	d Engg.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0	0	3	Examination	:	75Marks
				Total	:	100 Marks
				Duration	of :	3 Hours
				Examination		

Course Objectives:

- 1. To hone verbal and written communication
- 2. To acquaint students with multiple forms and formats of various technical and business reports
- 3. To develop competence for report writing with a focus on its techniques
- 4. To develop English Language Proficiency

UNIT I

(Contact hours 8)

Mechanics of Report Writing: Objectives of Report Writing; Types of Reports on the basis of forms and content. Introduction to Formats of Reports; Structure of Reports: Front Matter, Main Body, Back Matter

UNIT II

(Contact hours 10)

Writing Business and Technical Report: Preliminary Strategies for Report Writing: Data Collection, Report Planning, Use of Illustrations, Point Formation, Preparing Notes/Drafts Using Appropriate Formats: Memo Format, Letter Format, Manuscript Format, Printed Forms

UNIT III

(Contact hours 10)

Oral Communication and Soft Skills: Group Discussions; Interviews for jobs: preparation and facing them Professional Presentations: Power Point Presentation, Oral Presentation, Role of Kinesics (Body Language) in Communication, General Etiquettes in Office areas, corporate lunch and dinner Handling, Telephone calls

UNIT IV

(Contact hours 8)

Resumes and Job application: Writing of Resume--Chronological Resume and Functional Resume, Request for Reference/Recommendation, Writing Application Letters for Job; Writing Covering letter

RECOMMENDED READING

- 1. Sharma, Sangeeta, and Binod Mishra. Communication Skills for Engineers and Scientists. PHI,2009.
- 2. Tyagi, Kavita, and Padma Mishra. Advanced Technical Communication. PHI, 2011.

- 3. Rizvi, M. Ashraf. Effective Technical Communication. McGraw Hill Education, 2014.
- 4. Kumar, Sanjay, and PushpLata. Communication Skills. OUP, 2011.
- 5. Raman, Meenakshi and SangeetaSharma.Communication Skills. OUP,2011.
- 6. *Bhatnagar, Nitin, and MamtaBhatnagar. Communicative English for Engineers and Professionals. Pearson Education, 2013.
 - (The soft copy of the book is available in the university library)
- 7. Mitra, Barun K. Personality Development and Soft Skills. OUP, 2011.
- 8. Kaul, Asha. Business Communication. PHI, 2nd Edition.
- 9. Namee, Patrick Mc. Success in Interviews: How to Succeed in any Job Interview, Ist Edition.
- 10. Argenti, Paul. Corporate Communication.6th Edition. McGraw Hill Education, 2012.

- 1. 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.
- 2. The use of scientific calculator will be allowed in the examination. However, programmable calculator, mobile phones or other electrical/ electronic items will not be allowed in the examination.
- 3. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 4. 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 Learning Outcomes:

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

- 1. Get acquainted with multiple forms and formats of various technical and business reports
- 2. Develop competence for report writing with a focus on its complex writing techniques and procedures.
- 3. Develop their speaking skills with professional proficiency.
- 4. Equip themselves for Letter Writing Skills.

Open Elective-I

(Common for All Branches) HUM 352 C Soft Skills and Interpersonal Communication B. Tech. Semester – VI (Computer Science and Engg.)

				× L	00 /		
L	Т	Р	Credits	Class Work		:	25 Marks
3	0	0	3	Examination		:	75Marks
				Total		:	100 Marks
				Duration	of	:	3 Hours
				Examination			

Course Objective:

To train students to learn Soft Skills and engage in a successful and fruitful Interpersonal Communication

UNIT I

(Contact hrs 08)

Soft Skills: Introduction to Soft Skills & their classification, Importance of Soft Skills: Writing Resume/CV, Engaging in Group discussion, Appearing for Job interviews

UNIT II

(Contact hrs 10)

Interpersonal Skills, Behaviour, Relationships and Communication: Development and Role of Effective Interpersonal Skills, Development of Effective Speaking and Listening Skills

UNIT III

(Contact hrs 10)

Non-Verbal Elements in Interpersonal Communication: Role of Body Language, Paralinguistic Features, Proxemics/Space Distance and Haptics in Interpersonal Communication

UNIT IV

(Contact hrs 08)

Personality Development for Personal and Professional Growth: Desirable Personality, Personality Types, Analysis of Personality Development (Freudian and Swami Vivekananda's Concept), Grooming Personality for Personal and Professional Life

RECOMMENDED READING:

- Mitra, Barun K. Personality Development and Soft Skills. Delhi: OUP, 2nd Edition, 2016.
- 2. Butterfield, Jeff.Soft Skills for Everyone. Cengage Learning, 2017.
- 3. Raman, Meenakshi and Sangeeta Sharma. Communication Skills. OUP, 2011.
- 4. Ramesh, Gopalaswamy and Mahadevan Ramesh. The ACE of Soft Skills, Pearson India, 2010.
- 5. Ribbons, Geoff and Richard Thompson.Body Language.Hodder & Stoughton, 2007.
- 6. Sharma, Sangeeta and Binod Mishra.Communication Skills for Engineers and Scientists. PHI, 2017.

- 1. 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.
- 2. The use of scientific calculator will be allowed in the examination. However, programmable calculator, mobile phones or other electrical/ electronic items will not be allowed in the examination.
- 3. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 4. 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 Learning Outcomes:

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

- 1. Know now how soft skills complement hard skills for career growth
- 2. Enhance communicative competence for professional enhancement
- 3. Learn desirable body language and other non-verbal elements in interpersonal communication
- 4. Groom personality for handling effectively various situations of personal and professional life

Open Elective-I

(Common for All Branches for all Semesters) HUM 354 C Introduction to French Language B. Tech. Semester – VI (Computer Science and Engg.)

L	Т	Р	Credits	Class Work		:	
3	0	0	3	Examination		:	
				Total		:	
				Duration	of	:	
				Examination			

Course Objectives:

- 1. To enable students to understand the elementary communication structures of French language
- 2. To enable students to know and learn elementary vocabulary and grammar of French language
- 3. To enable students to engage in simple dialogues in French language

UNIT I

VOCABULAIRE: Les Salutations, Les jours de la semaine, Les moins de l'année, Les couleurs, Les professions, Les nombrescardinaux, Les lieux de la ville, Les nationalites, Personnesetobjetscaractéristiques d'un pays, Civilisation: France, de la sociétéfrancaise, les monuments, les fêtes

UNIT II

(Contact hours 10)

(Contact hours 10)

GRAMMAIRE: Conjugation des verbeetre, avoir, aller; Conjugation des verbe -er, -ir, -re Masculin/feminine, Singulier/ pluriel, Accord des nomset des adjectives, Articles indéfiniset défines, Négation simple, Interrogation, Futurproche, On= Nous, Articles partitifsetcontractes, La date etl'heure

UNIT III

(Contact hours 8)

(Contact hours 8)

ECRITURE (comprehension des écrits, Production écrite), Presentez- vous, Mon meuillierami, Ma famille, Carteset messages d'invitation, d'acceptationou de refus, Ecrives des scenes

UNIT IV

COMPREHENSION (écouter, production orale): Se presenter à ungroupe, Parlez/ écoutezdevotreville, Parlez/écoutezdesesactivités de loisirs, Parlez /écoutez de vosgoûts, Demander/ donnerun explication, Identifier unepersonneouun objet, Demander/dire cequ'ona fait

25 Marks 75Marks 100 Marks **3 Hours**

RECOMMENDED READING

- 1. Echo A1 Methode de Francais, CLE International (Distributed in India by W. R. Goyal Publishers & Distributors, Delhi)
- 2. Connexions, niveau 1, Yves Loiseau and R_gineM_rieux(Goyal Publishers)
- 3. Alter Ego-1, Hachette (Distributed in India by W. R. Goyal Publishers & Distributors, Delhi)
- 4. Forum- Methode de Francais 1, Hachette (Distributed in India by W. R. Goyal Publishers & Distributors, Delhi)
- 5. 450 Exercises de Grammaire, CLE International (Distributed in India by W. R. Goyal Publishers & Distributors, Delhi)
- 6. Audio- Video study material
- 7. Supplementary handouts

Note:

- 1. 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.
- 2. The use of scientific calculator will be allowed in the examination. However, programmable calculator, mobile phones or other electrical/ electronic items will not be allowed in the examination.

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 Learning Outcomes:

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

- 1. Familiarize with the basics of French language
- 2. Understand and express vocabulary and grammar through writing
- 3. Demonstrate understanding through simple dialogues in French

Open Elective-I (Common for All Branches for all Semesters) HUM 356 C Introduction to German Language

			B. Tech. Semester	– VI (Computer Science an	d Engg	.)	
L	Т	Р	Credits	Class Work		:	25 Marks
3	0	0	3	Examination		:	75Marks
				Total		:	100 Marks
				Duration	of	:	3 Hours
				Examination			

Course Objectives:

- 1. To enable students to understand the elementary communication structures of German language
- 2. To enable students to know and learn elementary vocabulary and grammar
- 3. To enable students to engage in simple dialogues in German

UNIT I

(Contact hours 10)

Introduction to German alphabets, Numbers 0- 100 (basic algebraic expressions), Vocabulary of days and months, Adverbs of time, Ordinal numbers in German, Phonetics and pronunciation

UNIT II

(Contact hours 10)

Introduction to the simple possessive pronouns, Sentence: statement, question, (question for completion and decision) command, Coordination of clauses, Placing of the verb in the sentence: first, second and last place, Word order in main clause, Details of time, manner and place (casual)

UNIT III

(Contact hours 8)

Verb: infinitive, imperative, indicative – Präsens, Perfekt, Präteritum of auxiliary and modal verbs, modal verbs (meaning, indicative Präsens&Präteritum, möchten), Verbs with prefixes – separable and inseparable, Nouns: Gender, plural, Nominative, Accusative, Dative Articles: Definite and Indefinite, Adjectives: predicative use

UNIT IV

(Contact hours 8)

Day-to-day conversation in German: Introducing oneself and other, greeting and taking leave, Meeting people, Time and date, months and weekdays, Inquire and name the country of origin, languages, Introduce family members and friends

RECOMMENDED READING

- 1. Tangram AktuellNiveau A1, Max HeuberVertag, Ismaning, 2005 (Published and distributed in India by German Book Depot, Delhi)
- 2. Netzwerk A1, KlettVerlag, Muenchen, 2013 (Published and distributed in India by German Book Centre, Delhi, 2015).

- 3. Sprachkurs Deutsch I &2. Diesterweg (Moritz) Verlag, Frankfurt am Main, 1989, (Published and distributed in India by Goyal Saab Publishers & Distributors, New Delhi)
- 4. Schuelerduden Grammatik, BibliographischesInstitutand F.ABrockhaus, 2000.
- 5. ThemenAktuell 1, Kursbuch, Max HeuberVerlag, Ismaning, Deutschland, 2003 (Published and distributed in India by German Book Centre, Delhi,2010).
- 6. Audio-video Study Material
- 7. Supplementary Handouts

- 1. 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.
- 2. The use of scientific calculator will be allowed in the examination. However, programmable calculator, mobile phones or other electrical/ electronic items will not be allowed in the examination.
- 3. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 4. 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 Learning Outcomes:

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

- 1. Familiarize with the basics of German language
- 2. Understand and express vocabulary and grammar through writing
- 3. Demonstrate understanding through simple dialogues in German

Open Elective-I

MGT402C HUMAN VALUES, ETHICS AND IPR

	B. Tech. Semester – VI (Computer Science and Engg.)							
L	Т	Р	Credits	Class Work		:	25 Marks	
3	0	0	3	Examination		:	75Marks	
				Total		:	100 Marks	
				Duration Examination	of	:	3 Hours	

Course Objectives:

To help the students appreciate the essential complementarities between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behaviour and mutually enriching interaction with Nature.

Unit-I

Human Values: Understanding the need, basic guidelines, Self Exploration - its content and process; 'Natural Acceptance' and Experiential Validation, Continuous Happiness and Prosperity- Human Aspirations, Right understanding, Relationship and Physical Facilities, Understanding Happiness and Prosperity correctly.

Unit-II

Different kinds of value: Understanding human being as a co-existence of the sentient 'I' and the material 'Body' Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha. Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail, Programs to ensure Sanyam and Swasthya.

Unit-III

Modern approach to the study of values: Understanding Harmony in the Family and Society-Harmony in Human-Human Relationship Understanding harmony in the Family, Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman).

Unit-IV

Professional Ethics & IPR: Values in Work-life, Professional Ethics and Ethos, Code of conduct, Whistle Blowing, Corporate Social Responsibility.IPR: meaning, nature, scope and relevance of IPR. Kinds of IPR: Copyright, Patents, Trademark, Geographical Indication, Industrial design, Plant Variety. Benefits, Emerging dimensions and Rational for protection of IPR.

Suggested Readings:

- 1. R. R. Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics, Excel Books, New Delhi
- 2. A.N. Tripathy, 2003, Human Values, New Age International Publishers.
- 3. E G Seebauer & Robert L.Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press.
- 4. M Govindrajan, S Natrajan& V. S Senthil Kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd.
- 5. S. B. Gogate, Human Values & Professional Ethics, Vikas Publishing House Pvt. Ltd., Noida.

Reference Books

- 1. A Nagraj, 1998 JeevanVidyaekParichay, Divya Path Sansthan, Amarkantak.
- 2. P. L. Dhar, R. R. Gaur, 1990, Science and Humanism, Commonwealth Publishers.
- 3. Prof. A.R.Aryasri, DharanikotaSuyodhana, Professional Ethics and Moral, Maruthi Publications.
- 4. A. Alavudeen, R.Kalil Rahman and M. Jayakumaran, Professional Ethics and Human Values, University Science Press.
- 5. Prof.D.R.Kiran, 2013, Professional Ethics and Human Values, Tata McGraw-Hill
- 6. Jayshree Suresh and B. S. Raghavan, Human Values And Professional Ethics, S.Chand Publications

Note:

- 1. 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.
- 2. The use of scientific calculator will be allowed in the examination. However, programmable calculator, mobile phones or other electrical/ electronic items will not be allowed in the examination.
- 3. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 4. 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:

At the end of the course:

- 1. Students will be able to understand the significance of value inputs in a classroom and start applying them in their life and profession
- 2. Understand and can distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.

- 3. Understand the role of a human being in ensuring harmony in society and nature.
- 4. Students will be aware of the significance of Intellectual Property as a very important driver of growth and development in today's world and to be able to statutorily acquire and use different types of intellectual property in their professional life.

Open Elective-I

MGT404C HUMAN RESOURCE MANAGEMENT

		В	5. Tech. Semester –	- VI (Computer Science a	nd Engg.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0	0	3	Examination	:	75Marks
				Total	:	100 Marks
				Duration	of :	3 Hours
				Examination		

Course Objectives:

To help the students develop an understanding of the management of human resources and develop abilities and skills required to manage them.

Unit-I

Introduction – nature and scope of human resource management, HRM objectives and functions, HRM policies, HRM in globally competitive environment; strategic human resource management.

Unit-II

Acquiring human resources – Man power planning, Job evaluation, job analysis and job design. Recruitment: Sources, Methods, constraints & challenges, selection: objectives and process, placement and induction.

Unit-III

Developing human resources: Training: types, methods, training vs. development and evaluation of a training programme and training need assessment, career planning and development.

Unit-IV

Performance appraisal: methods, process and challenges of performance appraisal, performance appraisal vs. potential appraisal, Compensation: wages & salaries administration and factors influencing compensation levels.

Suggested Readings:

- 1. Jyothi, Human Resource Management, Oxford University Press
- 2. Bohlander George and Scott Snell, Management Human Resources, Cengage, Mumbai
- 3. Bhattacharyya, Dipak Kumar, Human Resource Management, Excel Books, NewDelhi
- 4. Cascio Wayne F., Managing Human Resources, TMH, New Delhi
- 5. DeCenzo, David A, and Stephan P. Robbins, Fundamentals of Human Resource Management, Wiley India, New Delhi
6. Denisi, Angelo S, and Ricky W Griffin, Human Resource Management, Biztantra, New Delhi

Note:

- 1. 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.
- 2. The use of scientific calculator will be allowed in the examination. However, programmable calculator, mobile phones or other electrical/ electronic items will not be allowed in the examination.
- 3. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 4. 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:

At the end of the course:

- 1. To have an understanding of the basic concepts, functions and processes of human resource management
- 2. To be aware of the role, functions and functioning of human resource department of the organizations.
- 3. To Design and formulate various HRM processes such as Recruitment, Selection, Training, Development, Performance appraisals and Reward Systems, Compensation Plans and Ethical Behavior.
- 4. Develop ways in which human resources management might diagnose a business strategy and then facilitate the internal change necessary to accomplish the strategy.

CSE431C CYBER SECURITY

B. Tech. Semester –	VI	(Computer	Science	and	Engg.)
---------------------	----	-----------	---------	-----	--------

Р	Credits	Class Work	:	25 Marks
	3	Examination	:	75Marks
		Total	:	100 Marks
		Duration Examination	of :	3 Hours
		Ū	Total Duration Examination	Total : Duration of : Examination

Course Objectives:

- 1. To understand cyber crime and its laws.
- 2. To work with tools and methods used in cyber crime.
- 3. To understand the life cycle of digital forensics.
- 4. To learn and understand web threats, challenges and protection policies.

UNIT- I

Introduction To Cybercrime:- Cybercrime and Information Security, Classifications of Cybercrimes, The need for Cyber laws, The Indian IT Act Challenges to Indian Law and Cybercrime Scenario in India, Weakness in Information Technology Act and it consequences, Digital Signatures and the Indian IT Act, Cybercrime and Punishment; Technology, Students and Cyber law; Survival tactics for the Netizens, Cyber-offenses: Cybers talking, Cyber cafe and Cyber crimes, Botnets, Attack Vector, Cloud Computing;

UNIT- II

Tools And Methods Used In Cybercrime:- Proxy Servers and Anonymizers, Phishing and identity theft, Password Cracking, Keyloggers and Spywares, Virus and Worms, Trojan Horses and Backdoors, Stenography, DoS and DDoS Attacks, SQL Injection, Buffer Overflow; Cybercrime: Mobile and Wireless Devices: Trends in Mobility, Attacks on Wireless Networks, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges, Registry Settings for Mobile Devices, Authentication Service Security Attacks on Mobile/Cell Phones

UNIT-III

Understanding Computer Forensics:- The Need for Computer Forensics, Cyber forensics and Digital Evidence, Forensics Analysis of E-Mail, Digital Forensics Life Cycle, Chain of Custody Concept, Network Forensics, Computer Forensics and Stenography, Relevance of the OSI 7 Layer Model to Computer Forensics, Forensics and Social Networking Sites: The Security/Privacy Threats, Challenges in Computer Forensics, Forensics Auditing, Anti forensics.

UNIT-IV

Cyber security Organizational Implications:- Cost of Cybercrimes and IPR Issues, Web Threats for Organizations, Security and Privacy Implications from Cloud Computing, Social Media Marketing, Social Computing and the Associated Challenges for Organizations, Protecting People's Privacy in the Organization, Organizational Guidelines for Internet Usage, Safe Computing Guidelines and Computer Usage Policy, Incident Handling, Forensics Best Practices, Media and Asset Protection, Importance of Endpoint Security in Organizations.

TEXT/ REFERENCE BOOKS:

"Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Nina Godbole, Sunit Belapur, Wiley India Publications, April, 2011.

Note:

- 1. 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.
- 2. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 3. 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:

- 1. Able to demonstrate cyber crime its laws and related terms.
- 2. Work with SQL injection, DOS attacks etc.
- Explain computer forensic, Network forensic cyber forensic.
 Understand safe computing guidelines, usage policies and incident handling.

Open Elective-II

CHE457C : INDUSTRIAL SAFTEY

		J	B. Tech. Semester -	- VI (Computer Science ar	id Engg.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0	0	3	Examination	:	75Marks
				Total	:	100 Marks
				Duration	of :	3 Hours
				Examination		

Course Objectives:

The purpose of this course is

- 1. To teach the students the concept of industrial safety and provide useful practical knowledge for workplace safety.
- 2. To identify, evaluate control the hazards to prevent or mitigate harm or damage to people, property and the environment.
- 3. To understand about fire and explosion, preventive methods, relief and its sizing methods
- 4. To analyze industrial hazards and its risk assessment

UNIT-I

Introduction: Concept of loss prevention, origin of process hazards, types of process hazards, acceptable risks, accident and loss statics, nature of accident process, concepts of inherent safety in plants or Factories, dose Vs response curve, toxicants entry route, thresh limit values, safety regulations.

UNIT-II

Hazards: Fire, Chemical (industrial and laboratory scale), electrical, mechanical, biohazards (natural and anthropogenic), toxic materials, their types and preventive measures, Liquid and vapor phase hazardous methods, storage and handling, containment, precautions, Personal safety precautions.

UNIT-III

Risk management principles, risk analysis techniques, risk control, hazards operability studies, hazard analysis, Fault tree analysis, Consequences analysis, human error analysis, accidental error analysis, economics of risk management, check list, reliability theory, event tree, HAZOP, safety reviews, what if analysis.

UNIT-IV

Safety audit, procedure for safety auditing, audit report, safety report, safety training, emergency planning and disaster management, introduction to security risk factors tables.

TEXT BOOKS:

- 1. Chemical Hazards and safety, 2nd Edition, DawandeDenet& Co., 2012
- 2. Loss preventions in process industries, Lees Butterworth-Heinemann, 1980.
- 3. Industrial safety Handbook, William and Handley, McGraw Hill.

REFERENCE BOOKS:

- 1. Safety and Hazard management in Chemical Industries, Vyas, Atlantic 2013.
- 2. Industrial safety, health environment & Security, Basudev Panda, Laxmi publication ISBN-97893-81159-43-9
- 3. Industrial Safety and Health Management, 4th Edition, C. Ray Asfahl, Prentice Hall International Series, 1984
- 4. Industrial Accident Prevention : A Safety Management Approach, Herbert William Heinrich

NOTES:

1. **Part A: Till academic session 2020-2021:**In Semester Examinations, the paper setter will set two questions from each unit (total 8 questions in all), covering the entire syllabus. Students will be required to attempt only five questions, selecting at least one question from each unit.

Part B: From Academic Session 2021-2022 onwards: For the semester examination, nine questions are to be set by the examiner. Question no. 1, containing 6-7 short answer type questions, will be compulsory & based on the entire syllabus. Rests of the eight questions are to be set by setting two questions from each of the four units of the syllabus. The candidates will be required to attempt five questions in all, selecting one from each unit. All questions will carry equal marks.

- 2. The use of scientific calculator will be allowed in the examination. However, programmable calculator, mobile phones or other electrical/ electronic items will not be allowed in the examination.
- 3. For students admitted in B.Tech. 1st Year (C-Scheme) in 2019 & onwards and all trailing students:

Examinations and evaluations of students shall be conducted, covering the entire syllabus, as per guidelines "AICTE Examination Reforms". Students shall be informed about these reforms.

Course Outcomes:

Students will be able to:

- 1. Analyze the effect of release of toxic substances.
- 2. Understand the industrial laws, regulations and source models.
- 3. Understand the methods of hazard identification and preventive measures and develop safety programs to prevent the damage or loss.
- 4. Conduct safety audits and improve safety practices.

Open Elective-II

CE406C : DISASTER MANAGEMENT

			B. Tech. Sem	ester – VI (Computer Science and Er	1gg.)	
L	Т	Р	Credits	Class Work	:	25 Marks
3	0	0	3	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Unit-I

Introduction to Disaster Management: Disaster, Emergency, Hazard, Mitigation, Disaster Prevention, Preparedness and Rehabilitation, Risk and Vulnerability, Classification of Disaster, Natural and Man-made Disasters, International day and Decade of Disaster Reduction.

Risk and Vulnerability to disaster mitigation and management options: Warning and Forecasting.

Unit-II

Hydro-meteorological based disasters I: Disaster Management Act 2005, Role of NDMA, NDRF, NIDM, Tropical Cyclones, Floods, droughts, mechanism, causes, role of Indian Metrological Department, Central Water Commission, structure and their impacts, classifications, vulnerability, Early Warning System, Forecasting, Flood Warning System, Drought Indicators, recurrence and declaration, Structural and Non-structural Measures.

Hydro-meteorological based disasters II: Desertification Zones, causes and impacts of desertification, Characteristics, Vulnerability to India and Steps taken to combat desertification, Forest Fires; Causes of Forest Fires; Impact of Forest Fires, Prevention.

Unit-III

Geological based disasters: Earthquake, Reasons, Compression, Shear, Rayleigh and Love Waves; Magnitude and Intensity Scales, Direct and Indirect Impact of Earthquake; Seismic Zones in India, Factors, Indian Standards Guidelines for RCC and Masonry Structures, Prevention and Preparedness for Earthquake, Tsunamis, Landslides and avalanches: Definition, causes and structure; past lesson learnt and measures taken; their Characteristic features, Impact and prevention, Atlas (BMTRPC); structural and non-structural measures.

Unit-IV

Manmade Disasters I: Chemical Industrial hazards; causes and factors, pre- and post-disaster measures; control; Indian Standard Guidelines and Compliance;

Traffic accidents; classification and impact, Fire hazards; Classification as per Indian Standards;

Fire risk assessment; Escape routes; fire-fighting equipment; classification of buildings, fire zones, occupancy loads; capacity and arrangements of exits,

Use of remote sensing and GIS in disaster mitigation and management.

Text Books:

- 1. Thomas D. Schneid., Disaster Management and Preparedness, CRC Publication, USA, 2001
- 2. Patrick Leon Abbott, Natural Disasters, Amazon Publications, 2002
- 3. Ben Wisner., At Risk: Natural Hazards, People vulnerability and Disaster, Amazon Publications, 2001
- 4. Oosterom, Petervan, Zlatanova, Siyka, Fendel, Elfriede M., "Geo-information for Disaster Management", Springer Publications, 2005
- 5. Savindra Singh and Jeetendra Singh, Disaster Management, Pravalika Publications, Allahabad
- 6. NidhiGaubaDhawan and AmbrinaSardar Khan, Disaster Management and Preparedness, CBS Publishers & Distribution

Reference Books:

1. Selected Resources Published by the National Disaster Management Institute of Home Affairs, Govt. of India, New Delhi.

Note:

- 1. 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.
- 2. The use of scientific calculator will be allowed in the examination. However, programmable calculator, mobile phones or other electrical/ electronic items will not be allowed in the examination.
- 3. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 4. 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:

At the end of the course, the student will be able to:

- 1. Knowledge of the significance of disaster management,
- 2. Analyze the occurrences, reasons and mechanism of various types of disaster
- 3. Understand the preventive measures as Civil Engineer with latest codal provisions
- 4. Apply the latest technology in mitigation of disasters

Open Elective-II

ECE327C Consumer Electronics

L

3

Т

0

Р

0

Credits

3

B. Tech. Semester – VI (Computer Science and Engg.)

Class Work:Examination:Total:Durationof

25 Marks 75Marks 100 Marks 3 Hours

Unit I

Examination

Monochrome TV (Introduction): Elements of a TV System, Picture transmission, Sound transmission, Picture reception, Sound reception, Synchronization, Receiver control, Image continuity, Scanning Process, Aspect Ratio, Flicker, Composite Video Signal, Picture Elements, Kell factor, Vertical Resolution, Horizontal Resolution, Video bandwidth, Interlacing, 625 Line System, Bandwidths for TV Transmission, Vertical and horizontal synch detail, Vestigial Side Band transmission(Advantages and Disadvantages)

Monochrome TV (Picture and Camera Tubes): Monochrome picture tube, beam reflection, Beam focusing, Screen Phosphor, Faceplate, Picture tube characteristics, picture tube circuit controls, Monochrome Camera Tubes: Basic principle, Image Orthicon, Vidicon, Plumbicon

Unit II

Colour TV Essentials: Compatibility, Colour perception, Three Colour theory, Luminance, Hue and Saturation, Dispersion and Recombination of light, Primary and secondary colours, luminance signal, Chrominance Signal, Colour picture tube, colour TV Camera, Colour TV display Tubes, colour Signal Transmission, Bandwidth for colour signal transmission, Colour TV controls. Cable TV, Block Diagram and principle of working of cable TV.

Plasma and LCD: Introduction, liquidcrystals, types of LCD's,TN, STN, TFT, Power requirements, LCD working, Principle of operation of TN display, Construction of TN display, Behaviour of TN liquid crystals, Viewing angle, colour balance, colour TN display, limitatons, advantages, disadvantages, applications.

Unit III

(10 Lectures)

LED and DMD: Introduction to LED Television, comparison with LCD and Plasma TV's, schematic of DMD, introduction to Digital Micro Mirror device, Diagram of DMD, principle of working, emerging applications of DMD.

Microwave Ovens and Air Conditioners: Microwaves, Transit Time, Magnetron, Waveguides, Microwave Oven, Microwave Cooking. Air conditioning, Components of air conditioning systems, all water Air conditioning systems, all air conditioning Systems, Split air conditioner.

Unit IV

(11 Lectures)

Microphones: Introduction, characteristics of microphones, types of microphone: carbon, movingcoil, wireless, crystal, introduction to tape recorder.

(12 Lectures)



Loudspeaker: Introduction to ideal and basic loudspeaker, loudspeaker construction types of loudspeaker: Dynamic and permanent magnet, woofers, tweeters, brief introduction to baffles, equalisers.

Text Books :

- 1. Consumer Electronics by S. P. Bali, Pearson Education.
- 2. Complete Satellite and Cable T.V by R.R Gulati, New Age International Publishers

Reference Books:

1. Monochrome and ColourTelevision by R. R. Gulati, New Age International Publishers

Note:

- 1. 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.
- 2. The use of scientific calculator will be allowed in the examination. However, programmable calculator, mobile phones or other electrical/ electronic items will not be allowed in the examination.
- 3. For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:
- 4. 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:

At the end of the course, students will demonstrate the ability to:

- 1. Identify and explain basic working of electronics products like TV, Microphone, loudspeaker, AC, Microwave ovens.
- 2. Learn various components of composite video signal and differentiate between line, brightness, saturation and to design the lower power consumption device, the primary challenge is how to minimize overall cost.
- 3. Acquire ability to design different display screen so that effect of radiations on eyes will be reduced.
- 4. Understand the general importance of product safety to consumers & producers will reduce the various adverse impacts of these devices on common man.

			B. Tech. Semeste	er – VI (Computer Science a	and Eng	g.)	
L	Т	Р	Credits	Class Work		:	25 Marks
0	0	4	2	Examination		:	75Marks
				Total		:	100 Marks
				Duration	of	:	3 Hours
				Examination			

CSE382C COMPILER DESIGN LAB

Course Objectives:

- 1. To acquire knowledge in different phases and passes of Compiler.
- 2. To use the Compiler tools like LEX, YACC, etc.
- 3. To design different types of compiler tools to meet the requirements of the realistic constraints of compilers.
- 4. To use Top-down and Bottom-up parsers. Construction of LL, SLR, CLR and LALR parse table.

List of Practicass:

- 1. Practice of LEX/YACC of compiler writing.
- 2. Write a program to check whether a string belong to the grammar or not.
- 3. Write a program to generate a parse tree.
- 4. Write a program to find leading terminals.
- 5. Write a program to find trailing terminals.
- 6. Write a program to compute FIRST of non-terminal.
- 7. Write a program to compute FOLLOW of non-terminal.
- 8. Write a program to check whether a grammar is left Recursion and remove left Recursion.
- 9. Write a program to remove left factoring.
- 10. Write a program to check whether a grammar is operator precedent.
- 11. To show all the operations of a stack.
- 12. To show various operations i.e. red, write and modify in a text file.

Course Outcomes:

- 1. Understand the concepts of Compilers
- 2. Understand the concepts of The actual roles of the lexical analyzer
- 3. Understand the concepts of different Parsing techniques and Construction of syntax trees
- 4. Understand the concepts of Type checking

			B. Tech. Semeste	er – VI (Computer Science a	and Eng	g.)	
L	Т	Р	Credits	Class Work		:	25 Marks
0	0	4	2	Examination		:	75 Marks
				Total		:	100 Marks
				Duration	of	:	3 Hours
				Examination			

CSE384C MOBILE APPLICATIONS DEVELOPMENT LAB

Course Objectives:

- 1. To describe and compare different mobile application models/architectures and patterns.
- 2. To apply mobile application models/architectures and patterns to the development of a mobile software application.
- 3. To describe the components and architecture of a mobile development framework (Google's Android Studio).
- 4. To apply a mobile development framework to the development of a mobile application.

List of Practicals:

- 1. Getting Started with Android Development.
- 2. Activities and Views: Android Manifest.xml, Activity Class, Basic View Components: Layouts and Buttons.
- 3. Navigation with Data: Working with Intent, Sharing Data Between Activities, Application Class.
- 4. Android Resources: String Resources, Loading Strings in XML, Loading Strings in Code, The Resource Values Folder.
- 5. Drawables Image Basics, Drawable Folders and Qualifiers, Dimensions, Image Padding, The ImageButton Widget.
- 6. Lists: Implementing an Android List, ListView, ListActivity, Empty Lists, ListAdapter, Sorting the Adapter, Overriding ArrayAdapter, List Interaction.
- 7. Dialogs, New and Old: AlertDialog, Custom Dialog, Support Library, Fragments, DialogFragment
- 8. Menus: Options Menu, Modifying an Options Menu, Context Menu.
- 9. Saving Data with Shared Preferences: Shared Preferences, Getting Started with SharedPreferences, PreferenceActivity.
- 10. Saving Data with a Database: Setting Up SQLite, Creating a Helper, using the Helper, Cursor and CursorAdapater.
- 11. Threading with AsyncTasks: Threading in Android, AsyncTask, Tracking Progress.
- 12. Styles and Themes: Introduction to Styling: Defining Styles, Defining Themes, Style Inheritance, Direct Theme References.

Course Outcomes:

- 1. Understand the concepts of mobile application models/architectures and patterns.
- 2. Apply mobile application models/architectures and patterns to the development of a mobile software application.

- 3. Understand the components and architecture of a mobile development framework (Google's Android Studio).
- 4. Apply a mobile development framework to the development of a mobile application.

			CSE386C DI	GITAL IMAGE PROCESSING LA	В	
			B. Tech. Semest	er – VI (Computer Science and Eng	g.)	
L	Т	Р	Credits	Class Work	:	25 Marks
0	0	4	2	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To review the fundamental concepts of a digital image processing system.
- 2. To analyze the images in the frequency domain using various transforms.
- 3. To evaluate the techniques for image enhancement and image restoration.
- 4. To categorize various compression techniques.

The students will be required to carry out 10 or 12 Lab exercises covering the theory course CSE326C: Digital Image Processing as assigned by concerned faculty.

Course Outcomes:

- 1. Review the fundamental concepts of a digital image processing system.
- 2. Analyze the images in the frequency domain using various transforms.
- 3. Evaluate the techniques for image enhancement and image restoration.
- 4. Categorize various compression techniques.

			C	CSE388C ADVANCED JAVA LAB		
			B. Tech. S	Semester – VI (Computer Science and Engg	g.)	
L	Т	Р	Credits	Class Work	:	25 Marks
0	0	4	2	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To use graphics, Animations and Multithreading for designing Simulation and Game based applications.
- 2. To design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
- 3. To design and develop Web applications
- 4. To design Enterprise based applications by encapsulating an application's business logic.

The students will be required to carry out 10 or 12 experiments covering the theory course CSE328C: Advanced Java as assigned by the concerned faculty.

Course Outcomes:

- 1. Use graphics, Animations and Multithreading for designing Simulation and Game based applications.
- 2. Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
- 3. Design and develop Web applications.
- 4. To design Enterprise based applications by encapsulating an application's business logic.

CSE390C IoT ARCHITECTURE & PROTOCOLS LAB

			D. Tech. Sem	ester – vi (Computer Science a	ոս Եւ	igg.)
L	Т	Р	Credits	Class Work	:	25 Marks
0	0	4	2	Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

Students should be able to work with

- 1. Python
- 2. Raspberry Pie
- 3. Arduino

List of Practicals

- 1. To study and configure raspberry pie and arduino
- 2. Write a Program for data types in python.
- 3. Write a Program for arithmetic operation in Python.
- 4. Write a Program for looping statement in Python
- 5. Write program for Blink LED using arduino/raspberry pie.
- 6. Write Program for RGB LED using Arduino/ raspberry pie.
- 7. Study the Temperature sensor and write a program for monitoring temperature using Arduino/ raspberry pie.
- 8. Write a Program to upload temperature and humidity data on cloud

Course outcomes:

On successful completion of the course, the student will be able to

- 1. Write programs in Phython
- 2. Work with Raspberry Pie
- 3. Work with Arduino
- 4. Device small projects using all hardware and software

CSEH382C CRYPTOCURRENCY WITH ETHEREUM LAB

			B. Tech. Semester	– VI (Computer Science and Engg.)		
L	Т	Р	Credits	Class Work	:	50 Marks
		4	2	Examination	:	50Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To understand working of Ethereum platform.
- 2. To study the security issues and safeguards related to trading.
- 3. To create smartcontracts using Remix.
- 4. To create a blockchain application.

Learn the basics of Ethereum platform with Ethereum Studio, a web-based IDE to create and test smart contracts and build a frontend.

The student should do the following using the learned concepts:

- i. Naive Blockchain construction
- ii. Implement Memory Hard algorithm Hashcash implementation
- iii. Implement Direct Acyclic Graph
- iv. Play with Go-ethereum
- v. Smart Contract Construction using Remix an Ethereum IDE and tools for the web. Remix is an open source tool written in JavaScript with support for writing of Solidity contracts, testing, debugging and deploying of smart contracts.
- vi. Develop Toy application using Blockchain
- vii. Implement Mining puzzles

Course Outcomes:

- 1. Understand Ethereum platform.
- 2. Implement the security issues and safeguards related to trading.
- 3. Create smartcontracts using Remix.
- 4. Develop a blockchain application.

CSEH386C INFORMATION SECURITY AND DATA HIDING LAB

B. Tech. Semester – VI (Computer Science and Engg.)TPCreditsClass Work: 25

L	Т	Р	Credits	Class Work	:	25 Marks
0	0	4	2	Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To learn the concept of information hiding.
- 2. To provide an insight to steganography techniques.
- 3. To learn Watermarking techniques
- 4. To understand the attacks on data hiding and how integrity of data is maintained.

The students will be required to carry out 10 or 12 experiments covering the theory course **CSEH306C** Information Security and Data Hiding as assigned by the concerned faculty.

Course Outcomes:

- 1. Learn the concept of information hiding.
- 2. Understand the steganography techniques.
- 3. Learn Watermarking techniques
- 4. Understand the attacks on data hiding and how integrity of data is maintained.

CSEH390C DATA ANALYTICS WITH PYTHON LAB

			B. Tech. Se	emester – VI (Computer Science and Engg	.)	
L	Т	Р	Credits	Class Work	:	25 Marks
0	0	4	2	Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

- 1. To learn the basic process of data science.
- 2. To learn Python notebooks.
- 3. To have an applied understanding of how to manipulate and analyze uncurated datasets, basic statistical analysis and machine learning methods.
- 4. To have an understanding on how to effectively visualize results.

The students will be required to carry out 10 or 12 experiments covering the theory course **CSE310C: Data Analytics with Python** as assigned by the concerned faculty.

Course Outcomes:

- 1. Find a dataset, formulate a research question, use the tools and techniques of this course to explore the answer to that question.
- 2. Learn Python notebooks.
- 3. Understand the manipulation and analysis of uncurated datasets, basic statistical analysis and machine learning methods.
- 4. Understand to effectively visualize results.