

Bachelor of Technology (Information Technology)

SCHEME OF STUDIES / EXAMINATIONS (KUK)

Semester – III (w.e.f. Session- 2016-17)

S. N.	Course No.	Course Title	Teaching Schedule				Allotment of Marks				Dur. of Exam (Hrs.)
			L	T	P	Hr /Wk	Theory	Sessional	Practical	Total	
1.	HS-201N	Fundamentals of Management	3	1	-	4	75	25	--	100	3
2.	IT-201N	Database Management Systems	3	1	-	4	75	25	--	100	3
3.	IT-203N	Data Structures	3	1	--	4	75	25	--	100	3
4.	IT-205N	Internet & Web Technology	3	1	--	4	75	25	--	100	3
5.	IT-207 N	Digital Electronics and Logic Design	3	1	--	4	75	25	--	100	3
6.	IT-209 N	Discrete Structures	3	1	--	4	75	25	--	100	3
7.	IT-211 N	Database Management Systems Lab	--	--	2	2	---	40	60	100	3
8.	IT-213 N	Data Structures Lab	--	--	2	2	---	40	60	100	3
9.	IT-215 N	Internet Lab	--	---	2	2	--	40	60	100	3
10.	IT-217 N	Digital Electronics Lab	--	--	2	2	--	40	60	100	3
		Total	18	6	8	32	450	310	240	1000	
11	MPC-202N*	Energy Studies*	3	--	--	3	75	25	-	100	3

* MPC-202N is a mandatory course which will be a non-credit subject and student has to get pass marks in order to qualify for the award of Degree.

Semester – IV (w.e.f. Session 2016-17)

S. N.	Course No.	Course Title	Teaching Schedule				Allotment of Marks				Dur of Exam (Hrs.)
			L	T	P	Hr/ Wk	Theory	Sessional	Practical	Total	
1.	AS-201 N	Mathematics - III	3	1	-	4	75	25	--	100	3
2.	IT-202 N	Computer Organization & Architecture	3	1	-	4	75	25	--	100	3
3.	IT- 204 N	Programming Languages	3	1	--	4	75	25	--	100	3
4.	IT-206 N	Object Oriented Programming Using C++	3	1	--	4	75	25	--	100	3
5.	IT-208 N	Operating Systems	3	1	--	4	75	25	--	100	3
6.	IT-210 N	Fundamentals of Microprocessor Interfacing & Application	3	1	--	4	75	25	--	100	3
7.	IT-212 N	Programming with C++ Lab	--	--	2	2	---	40	60	100	3
8.	IT-214 N	Microprocessor & Interfacing Lab	--	--	2	2	---	40	60	100	3
9.	IT-216 N	Computer Hardware and Troubleshooting Lab	--	--	2	2	---	40	60	100	3
10.	IT-218 N	Programming with MATLAB	--	--	2	2	--	40	60	100	3
		Total	18	5	9	32	450	310	240	1000	
11.	MPC-201 N*	Environmental Studies*	3	--	--	3	75	25	-	100	3

*MPC-201N is a mandatory course which will be non-credit subject and students has to get pass marks in order to qualify for the award of degree.

Note:- All the students have to undergo 4-6 week industrial training after 4th semester and it will be evaluated in 5th semester.

Purpose : To make the students conversant with the basics concepts in management thereby leading to nurturing their managerial skills

COURSE OUTCOMES

CO1 An overview about management as a discipline and its evolution

CO2 Understand the concept and importance of planning and organizing in an organization

CO3 Enabling the students to know about the importance of hiring and guiding the workforce by understanding the concept of leadership and communication in detail

CO4 To understand the concept and techniques of controlling and new trends in management

UNIT-1

Introduction to Management: Meaning, Definition, nature, importance & Functions, Management as Art, Science & Profession-Management as social System, Concepts of management-Administration

Evolution of Management Thought: Development of Management Thought-Scientific management, Administrative Theory of Management, Bureaucratic Organization, Behavioral approach (Neo Classical Theory): Human Relations Movement; Behavioral Science approach; Modern approach to management –Systems approach and contingency approach.

UNIT-II

Planning: nature, purpose and functions, types of plans, planning process, Strategies and Policies: Concept of Corporate Strategy, formulation of strategy, Types of strategies, Management by objectives (MBO), SWOT analysis, Types of policies, principles of formulation of policies

Organizing: nature, importance, process, organization structure: Line and Staff organization, Delegation of Authority and responsibility, Centralization and Decentralization, Decision Making Process , Decision Making Models, Departmentalization: Concept and Types (Project and Matrix), formal & informal organizations

UNIT-III

Staffing: concept, process, features; manpower planning; Job Analysis: concept and process; Recruitment and selection: concept, process, sources of recruitment; performance appraisal, training and development Directing: Communication-nature, process, formal and informal, barriers to Effective Communication, Theories of motivation-Maslow, Herzberg, Mc Gregor ; Leadership–concept and theories, Managerial Grid, Situational Leadership. Transactional and Transformational Leadership

UNIT-IV

Controlling: concept, process, types, barriers to controlling, controlling Techniques: budgetary control, Return on investment, Management information system-MIS , TQM-Total Quality Management, Network Analysis-PERT and CPM. Recent Trends in Management:-Social Responsibility of Corporate Social Responsibility (CSR) and business ethics. Functional aspects of business: Conceptual framework of functional areas of management-Finance; Marketing and Human Resources

Text books

1. Management Concepts -Robbins, S.P; Pearson Education India
2. Principles of Management -Koontz & O'Donnel; (McGraw Hill)

Recommended books

1. Business Organization and Management –Basu ; Tata McGraw Hill
2. Management and OB--Mullins; Pearson Education
3. Essentials of Management –Koontz, Tata McGraw-Hill
4. Management Theory and Practice –Gupta, C.B; Sultan Chand and Sons, New Delhi
5. Prasad, Lallan and S.S. Gulshan. Management Principles and Practices. S. Chand & Co. Ltd., New Delhi.
6. Chhabra T.N. Principles and Practice of Management. Dhanpat Rai & Co., Delhi.
7. Organizational Behavior –Robins Stephen P; PHI.

NOTE: Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-201 N	Data Base Management Systems					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	1	-	75	25	100	3 Hour
Purpose	To familiarize the students with Data Base Management system					
Course Outcomes						
CO 1	To provide introduction to relational model.					
CO 2	To learn about ER diagrams and SQL.					
CO 3	To understand about the concept of functional dependencies.					
CO 4	To understand about Query Processing and Transaction Processing.					

UNIT I

Introduction

Concept & Overview of DBMS, Advantages of DBMS over file processing system, Database Languages, Responsibilities of Database Administrator, Database Users, Three Schema architecture of DBMS & Data Independence, Data Models.

Entity-Relationship Model:

Basic concepts, Mapping Constraints, Keys, Entity-Relationship Diagram, Weak Entity Sets, Extended E-R features: Specialization and Generalization.

UNIT II

The Relational Data Model & Algebra

Relational Model: Structure of relational Databases, Relational Algebra & various operations(Set operation, select, project, joins, division), Relational Calculus: Domain , Tuple.

Integrity Constraints & Introduction To Sql:-

Domain Constraints, Referential Integrity Constraints, Basic Structure & Concept of DDL, DML, DCL, Aggregate Functions, Null Values, Introduction to views, Creating, modifying and deleting views.

UNIT III

Relational Database Design

Functional Dependency, Different anomalies in designing a Database., Normalization – 1NF, 2NF, 3NF, Boyce-Codd Normal Form, Normalization using multivalued dependencies, 4NF, 5NF.

UNIT IV

Transaction Processing Concept

Introduction to transaction processing, transaction model properties, serializability:-Serial, non-serial and Serializable Schedules, Conflict Serializability.

Concurrency Control

Need of concurrency control, Different concurrency control Techniques: locking based, timestamps based technique. Deadlock handling and Recovery Techniques:- Deferred update/ immediate update, shadow paging.

Text Books:

- Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 3rd edition, 2000, Addison-Wesley, Low Priced Edition.
- Introduction to Database Management system by Bipin Desai, 1991, Galgotia Pub.

Reference Books:

- Database System Concepts by A. Silberschatz, H.F. Korth and S. Sudarshan, 3rd edition, 1997, McGraw-Hill, International Edition.
- An Introduction to Database Systems by C.J. Date, 7th edition, Addison-Wesley, Low Priced Edition, 2000.
- Database Management and Design by G.W. Hansen and J.V. Hansen, 2nd edition, 1999, Prentice-Hall of India, Eastern Economy Edition.
- Database Management Systems by A.K. Majumdar and P. Bhattacharyya, 5th edition, 1999, Tata McGraw-Hill Publishing.
- A Guide to the SQL Standard, Date, C. and Darwen, H. 3rd edition, Reading, MA: 1994, Addison-Wesley.
- Data Management & file Structure by Looms, 1989, PHI

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

IT-203 N	Data Structures					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	1	-	75	25	100	3 Hour
Purpose	To introduce the principles and paradigms of Data Structures for design and implement the software systems logically and physically					
Course Outcomes (CO)						
CO 1	To introduce the basic concepts of Data structure, basic data types, searching and sorting based on array data types.					
CO 2	To introduce the structured data types like Stacks, Queue, and its basic operations' implementation.					
CO 3	To introduces dynamic implementation of linked list.					
CO 4	To introduce the concepts of Tree and graph and implementation of traversal algorithms.					

Unit-1

Introduction to Data Structures: Definition & abstract data types, Real life applications with example; built in and user defined data structures, Ordered list and Operations on it.

Arrays: Definition, implementation, lower bound, upper bound, addressing an element at a particular index for one dimensional arrays, Two dimensional arrays and Multidimensional arrays. Implementation of Data Structures like structure, Sparse matrices: implementation of transpose.

Sorting & Searching: Basic Searching techniques (Linear & binary), Introduction to Sorting. Sorting using selection, insertion, bubble, merge, quick, radix, heap sort.

Unit-2

Stacks : Sequential implementation of stacks, operations, Polish-notations, Evaluation of postfix expression, Converting Infix expression to Prefix and Postfix expression ,Applications.

Queues: Definition, Sequential implementation of linear queues, Operations. Circular queue: implementation (using arrays), Advantage over linear queue, Priority queues& Applications.

Unit-3

Linked Lists: Need of dynamic data structures, Operations on lists. Dynamic implementation of linked lists, Comparison between Array and Dynamic Implementation of linked list. Linked implementation of stacks and queues. Circular lists, implementation of primitive operations. Doubly linked lists: continuous & dynamic implementation, operations.

Unit- 4

Trees : Definition, Basic terminology, Binary tree, Array and Dynamic Implementation of a binary tree, primitive operations on binary trees. External and internal nodes.Binary tree traversals : preorder, inorder and postorder traversals. Representation of infix, postfix and prefix expressions using tree, Introduction to Binary Search Trees, B trees, B+ trees , AVL Trees, threaded trees, balanced multi way search trees.

Graphs: Definition of undirected & Directed Graphs & Networks, Basic terminology, Representation of graphs,. Graph traversals, minimum-spanning trees, computer representation of graphs.

Text Book:

1. Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.

Reference Books:

1. Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
2. Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983, AW
3. Fundamentals of computer algorithms by Horowitz Sahni and Rajasekaran.
4. Data Structures and Program Design in C By Robert Kruse, PHI,
5. Theory & Problems of Data Structures by Jr. Seymour Lipschetz, Schaum's outline by TMH
6. Introduction to Computers Science -An algorithms approach, Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

Internet and Web Technology						
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	1	-	75	25	100	3
Purpose	To provide the conceptual knowledge of Internet and methodologies used in web based					
Course Outcomes						
CO 1	To study about basics of internet and networking.					
CO 2	To study inner working of email.					
CO 3	To learn web design languages					
CO 4	To study basic of internet security.					

Unit-1

The Internet: Introduction to networks and internet, history, Internet, Intranet & Extranet, Working of Internet, Internet Congestion, Network Topologies, Modes of Connecting to Internet, Internet Service Providers(ISPs), Internet address, standard address, Introduction to OSI and TCP/IP, domain name, DNS, Telnet and FTP, HTTP, IP.v6, Modems..

Unit-2

World Wide Web : Introduction, Miscellaneous Web Browser details, searching the www: Directories search engines and meta search engines, search fundamentals, search strategies, working of the search engines.

Electronic Mail: Introduction, advantages and disadvantages, User Ids, Pass words, e-mail addresses, message components, message composition, mailer features, E-mail inner workings, MIME, Newsgroups, mailing lists, chat rooms, secure-mails, SMTP, POP, IMAP.

Unit-3

HTML: HTML basics; HTML tags; text formatting; text styles; lists: ordered, unordered and definition lists; layouts; adding graphics; tables; linking documents; images as hyperlinks; Form; frames and layers.

CSS – basic style sheet concept, using style sheet in your document.

JAVASCRIPT Features of JavaScript, Variables, Control Structures, operators, looping, conditional statements & functions in JavaScript

Unit-4

Privacy and security topics: Introduction, Need of Security, Attacks, Types of attacks, security policy, Introduction to Encryption and Decryption, Secure Web document, Digital Signatures, Firewalls, Intrusion detection systems, Proxy Server, VPN.

Introduction to Server:- Introduction to client-server architecture, Apache, Internet Information Server

Text Book:

- Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw & Ellen Hepp – 2001, TMH
- Internet & World Wide Programming, Deitel & Nieto, 2000, Pearson Education

Reference Books:

- HTML– Complete Reference By Thomas A Powell – TMH
- JavaScript – Unleashed - 3 rd Edition from SAMS – Tech Media
- Complete idiots guide to java script, Aron Weiss, QUE, 1997
- Network firewalls, Kironjeetsyan -New Rider Pub.
- Networking Essentials – Firewall Media.
- www.secnf.com
- www.hackers.com
- Alfred Gikossbrenner-Internet 101 Computing MGH, 1996

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

IT – 207 N	Digital Electronics and Logic Design					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	1	-	75	25	100	3 Hour
Purpose	To learn the basic methods for the design of digital circuits					
Course Outcomes						
CO 1	To introduce Simplification of switching functions using K map and QM methods					
CO 2	To introduce to combinational circuit design					
CO 3	Digital circuit design using sequential method					
CO 4	To convert data from analog to digital form and vice versa.					

UNIT 1

Fundamentals of digital techniques:

Review of logic gates and number system; 1's and 2's compliment Arithmetic ; Introduction to Boolean algebra using basic postulates and theorems ; Binary codes: BCD, Excess-3, Gray codes ; Standard representation of logic functions : SOP and POS forms; Simplification of switching functions using K map and Quine-McCluskey methods

UNIT 2

Design of Combinational circuits

Adders; Subtractors ; Multiplexers and Demultiplexers / Decoders and their use as logic elements; BCD arithmetic Circuits; Encoders. Decoders / Drivers for display devices. , code converters

UNIT 3

Sequential circuits:

Latches, Flip Flops: S-R- J-K. T, D, master-slave, edge triggered flip flop ;Race around condition; Excitation table ; Interconversion among flip flop, Design of Synchronous and Asynchronous counters ; Modulo N counter design ; Shift registers ; sequence generators.

UNIT 4

A/D and D/A converters:

Sample and hold circuit, weighted resistor and R -2 R ladder D/A Converters, specifications for D/A converters. A/D converters: Quantization, parallel -comparator, successive approximation, counting type , Dual-slope ADC, specifications of ADCs.

Programmable Logic Devices:

PLA and PAL. , Implementation of simple functions using PLA and PAL

Text book:

1. Modern Digital Electronics (Edition III): R. P. Jain; TMH
2. Donald P. Leach and Albert Paul Malvino, Digital Principles and Applications, 8th Edition, TMH, 2003.M

Reference books:

1. Digital Integrated Electronics: Taub & Schilling: MGH
2. Digital Principles and Applications: Malvino & Leach: McGraw Hill.
3. Digital Design: Morris Mano: PHI,
4. Thomas L. Floyd, Digital Fundamentals, 8th Edition, Pearson Education Inc, New Delhi, 2003

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

IT-209 N	Discrete Structures					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	1	-	75	25	100	3
Purpose	To provide the conceptual knowledge of Discrete structure.					
Course Outcomes						
CO 1	To study various fundamental concepts of Set Theory and Logics.					
CO 2	To study and understand the Relations, diagraphs and lattices.					
CO 3	To study the Functions and Combinatorics.					
CO 4	To study the Algebraic Structures.					

Unit 1

Set Theory & Logic Fundamentals-Sets and subsets, Venn Diagrams, Operations on sets, Laws of Set Theory, Power Sets and Products, Partition of sets, The Principle of Inclusion-Exclusion. Logic : Propositions and Logical operations, Truth tables, Equivalence, Implications, Laws of Logic, Normal forms, Predicates and quantifiers, Mathematical Induction.

Unit 2

Relations, diagraphs and lattices Product sets and partitions, relations and diagraphs, paths in relations and diagraphs, properties of relations, equivalence and partially ordered relations, computer representation of relations and diagraphs, manipulation of relations, Transitive closure and Warshall's algorithm, Posets and Hasse Diagrams, Lattice.

Unit 3

Functions and Combinatorics Definitions and types of functions: injective, subjective and bijective, Composition, identity and inverse, Review of Permutation and combination-Mathematical Induction, Pigeon hole principle, Principle of inclusion and exclusion, Generating function-Recurrence relations.

Unit 4

Algebraic Structures Algebraic structures with one binary operation -semi groups, monoids and groups, Product and quotient of algebraic structures, Isomorphism, homomorphism, automorphism, Cyclic groups, Normal sub group, codes and group codes, Ring homomorphism and Isomorphism.

Books:

1. Elements of Discrete Mathematics C.L Liu, 1985, Reprinted 2000, McGraw Hill
2. Discrete mathematical structures by B Kolman RC Busby, S Ross PHI Pvt. Ltd.

Reference:

1. Discrete Mathematical Structures with Applications to Computer Science , by Tremblay J.P, and Manohar R., McGraw Hill Book Company, 1975, International Edition, 1987.
2. Discrete and Combinatorial mathematics ", Ralph P., Grimaldi, Addison-Wesley Publishing Company,
3. Reprinted in 1985.
4. Discrete Mathematics and its Applications ", Kenneth H.Rosen, McGraw Hill Book Company, 1999.
5. Sections: 7.1 to 7.5.
6. Discrete Mathematics for computer scientists and Mathematicians, Joe L. Mott, Abraham

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

Database Management Systems Lab
Paper- IT-211 N

L T P
- - 2

Sessional: 40 Marks
Exam: 60 Marks
Total: 100 Marks
Duration of Exam: 3 Hrs.

LIST OF EXPERIMENTS

1. Create a database and write the programs to carry out the following operation:
 - Add a record in the database
 - Delete a record in the database
 - Modify the record in the database
 - Generate queries
 - Data operations
 - List all the records of database in ascending order.
2. To perform various integrity constraints on relational database.
3. Create a database and perform the following operations:-
 - Arithmetic operators
 - Relational operators
 - Group by & having clauses
 - Like predicate for pattern matching in database
4. Create a view to display details of employees working on more than one project.
5. Create a view to display details of employees not working on any project.
6. Using two tables create a view which shall perform natural join, equi join, outer joins.
7. Write a procedure to give incentive to employees working on all projects. If no such employee found give app. Message.
8. Write a procedure for computing amount telephone bill on the basic of following conditions.
 1. telephone rent Rs. 205 including first 105 free units.
 2. if extra units>0 but <500 then rate is 80 paise per unit.
 3. if extra units>500 then rate is Rs. 1.20 per unit.For this purpose create a table with name, Phone No., No. of units consumed, bill amount of a customer.
9. Write a procedure for computing income tax of employee on the basic of following conditions:-
 1. if gross pay<=40,000 then I.T rate is 0%.
 2. if gross pay>40,000 but <60000 then I.T rate is 10%.
 3. if gross pay>60,000 but <1,00,0000 then I.T rate is 20%.
 4. if gross pay>1,00,0000 then I.T rate is 30%.For this purpose create a table with name, ssn, gross salary and income tax of the employee.
10. Write trigger for before and after insertion, deletion and updation process.

Usage of S/w:

1. VB, ORACLE and/or DB2
2. VB, MSACCESS
3. ORACLE, D2K
4. VB, MS SQL SERVER 2000

Data Structures Lab
Paper- IT-213 N

L T P
- - 2

Sessional:40 Marks
Exam: 60 Marks
Total:100 Marks
Duration of Exam: 3 Hrs.

LIST OF EXPERIMENTS

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration & recursion concepts write programs for finding the element in the array using Binary Search Method
- 3.. Write a program to perform following operations on tables using functions only
a) Addition b) Subtraction c) Multiplication d) Transpose
- 4.. Write a program to implement Queue.
5. Write a program to implement Stack.
6. Write a program to implement the various operations on string such as length of string concatenation, reverse of a string & copy of a string to another.
7. Write a program for swapping of two numbers using 'call by value' and 'call by reference strategies'.
8. Write a program to implement binary search tree. (Insertion and Deletion in Binary search Tree)
9. Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the link list
- 10 .Write the program for implementation of a file and performing operations such as insert, delete, update a record in the file.
11. Create a linked list and perform the following operations on it
a) add a node b) Delete a node
12. Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements.
13. Write a program to simulate the various graph traversing algorithms.
- 14 Write a program which simulates the various tree traversal algorithms.
- 15 Write a program to implement various Searching Techniques.
- 16 Write a program to implement Sorting Techniques.

LIST OF EXPERIMENTS

1. Create a new document that takes the format of a business letter. Combine <P> and
 tags to properly separate the different parts of the documents. Such as the address, greeting, content and signature.
2. a) Create a seven-item ordered list using Roman numerals. After the fifth item, increase the next list value by 5.
b) Beginning with an ordered list, create a list that nests both an unordered list and a definition list.
3. Create a table using HTML basic tags.
4. Create a online form in HTML.
5. Create frame with anchor tag.
6. Create links in HTML with the graphics embedding.
7. Create a style sheet in HTML.
8. Find the factorial of a number using looping conditional statement in javascript.
9. Create a program to find out whether the string is palindrome or not using javascript.
10. Create a form & check the form validation through javascript.

Digital Electronics Lab
Paper-IT- 217 N

L T P
-- 2

Sessional :40 Marks
Practical: 60Marks
Total: 100 Marks
Duration of Exam: 3 Hrs.

LIST OF EXPERIMENTS

1. Study of TTL gates – AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.
2. Design & realize a given function using K-maps and verify its performance.
3. To verify the operation of multiplexer & Demultiplexer.
4. To verify the operation of comparator.
5. To verify the truth tables of S-R, J-K, T & D type flip flops.
6. To verify the operation of bi-directional shift register.
7. To design & verify the operation of 3-bit synchronous counter.
8. To design and verify the operation of synchronous UP/DOWN decade counter using J K flipflops & drive a seven-segment display using the same.
9. To design and verify the operation of asynchronous UP/DOWN decade counter using J K flipflops & drive a seven-segment display using the same.
10. To design & realize a sequence generator for a given sequence using J-K flip-flops.
11. Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.
12. Design a 4-bit shift-register and verify its operation .

Note : A student has to perform at least ten experiments.
Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

L T P
3 - -

Sessional: 25 Marks
Exam: 75 Marks
Total: 100 Marks
Time: 3 hrs

UNIT-I

Introduction: Types of energy, Conversion of various forms of energy, Conventional and Nonconventional sources, Need for Non-Conventional Energy based power generation.

Energy Management: General Principles of Energy Management, Energy Management Strategy.

Energy Audit & Tariffs: Need, Types, Methodology and Approach.

UNIT-II

Conventional Energy sources: Selection of site, working of Thermal, Hydro, Nuclear and Diesel power plants and their schematic diagrams & their comparative advantages- disadvantages.

UNIT-III

Non Conventional Energy sources: Basic principle, site selection and power plant layout of Solar energy, photovoltaic technologies, PV Systems and their components, power plant layout of Wind energy, layout of Bio energy plants, Geothermal energy plants and tidal energy plants.

UNIT-IV

Energy Scenario: Lay out of power system, Role of Energy in Economic development, energy demand, availability and consumption, Commercial and Non-commercial energy, Indian energy scenario, long term energy scenario, energy pricing, energy sector reforms in India, energy strategy for the future.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

Suggested Text Books & References:

1. Energy Studies-Wiley and Dream tech India
2. Soni, Gupta, Bhatnagar: Electrical Power Systems – Dhanpat Rai& Sons
3. NEDCAP: Non Conventional Energy Guide Lines
4. G.D. Roy: Non conventional energy sources
5. B H Khan: Non Conventional energy resources - - McGraw Hill
6. Meinel A B and Meinal M P, Addison :Applied Solar Energy- Wesley Publications
7. George Sutton: Direct Energy Conversion - McGraw Hill

Lecture	Tutorial	Practical	Major Test	Minor Test	Total Time
3	1	-	75	25	3H

Purpose To provide the conceptual knowledge of Engineering mathematics

Course Outcomes

CO 1 To study various fundamental concepts of Fourier series and Fourier Transformation.

CO 2 To study and understand the functions of a complex variables.

CO 3 To study the Probability Distributions.

CO 4 To study the linear programming problem formulation.

UNIT – I

Fourier Series : Euler's Formulae, Conditions for Fourier expansions, Fourier expansion of functions having points of discontinuity, change of interval, Odd & even functions, Half-range series.

Fourier Transforms : Fourier integrals, Fourier transforms, Fourier cosine and sine transforms.

Properties of Fourier transforms, Convolution theorem, Parseval's identity, Relation between Fourier and Laplace transforms, Fourier transforms of the derivatives of a function, Application to boundary value problems.

UNIT-II

Functions of a Complex Variables : Functions of a complex variable, Exponential function, Trigonometric, Hyperbolic and Logarithmic functions, limit and continuity of a function, Differentiability and analyticity.

Cauchy-Riemann equations, Necessary and sufficient conditions for a function to be analytic, Polar form of the Cauchy-Riemann equations, Harmonic functions, Application to flow problems, Conformal transformation, Standard transformations (Translation, Magnification & rotation, inversion & reflection, Bilinear).

UNIT-III

Probability Distributions : Probability, Baye's theorem, Discrete & Continuous probability distributions, Moment generating function, Probability generating function, Properties and applications of Binomial, Poisson and normal distributions.

UNIT-IV

Linear Programming: Linear programming problems formulation, Solution of Linear Programming Problem using Graphical method, Simplex Method, Dual-Simplex Method.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

Text Book

1. Higher Engg. Mathematics : B.S. Grewal
2. Advanced Engg. Mathematics : E. Kreyzig

Reference Book

1. Complex variables and Applications : R.V. Churchill; Mc. Graw Hill
2. Engg. Mathematics Vol. II: S.S. Sastry; Prentice Hall of India.
3. Operation Research : H.A. Taha.
4. Probability and Statistics for Engineer : Johnson. PHI.

IT-202 N	Computer Organization & Architecture					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	1	-	75	25	100	3
Purpose	To familiarize with the architecture of computer system					
COURSE OUTCOMES						
CO1	To study the architecture and instruction set.					
CO2	To know about how instruction can be fetch and execute.					
CO3	To study about the memory.					
CO4	To study the parallelism and interrupts.					

Unit-1

General System Architecture: Von-neumann Model, Store program control concept, Flynn's classification of computers (SISD, MISD, MIMD); Multilevel viewpoint of a machine: digital logic, micro architecture, ISA, operating systems, high level language; structured organization; CPU, caches, main memory, secondary memory units & I/O; Performance metrics; MIPS, MFLOPS, Common us system

Instruction Set Architecture: Instruction set based classification of processors (RISC, CISC, and their comparison); addressing modes: register, immediate, direct, indirect, indexed; Operations in the instruction set; Arithmetic and Logical, Data Transfer, Machine Control Flow; Instruction set formats (fixed, variable, hybrid).

Unit-2

Basic non pipelined CPU Architecture: CPU Architecture types (accumulator, register, stack, memory/ register) detailed data path of a typical register based CPU, Fetch-Decode-Execute cycle (typically 3 to 5 stage); microinstruction sequencing, implementation of control unit, Enhancing performance with pipelining.

Unit-3

Memory Hierarchy & I/O Techniques: The need for a memory hierarchy (Locality of reference principle, Memory hierarchy in practice: Cache, main memory and secondary memory, Memory parameters: access/ cycle time, cost per bit); Main memory (Semiconductor RAM & ROM organization, memory expansion, Static & dynamic memory types); Cache memory (Associative & direct mapped cache organizations. Allocation & replacement polices, segments, pages & file organization, virtual memory.

Unit-4

Introduction to Parallelism: Goals of parallelism (Exploitation of concurrency, throughput enhancement); Amdahl's law; Instruction level parallelism (pipelining, super scaling –basic features); Processor level parallelism (Multiprocessor systems overview).Types of interrupts; Memory Hierarchy. Programmed I/O, DMA & Interrupts.

Text Books:

- Computer Organization and Design, 2nd Ed., by David A. Patterson and John L. Hennessy, Morgan 1997, Kauffmann.
- Computer Architecture and Organization, 3rd Edi, by John P. Hayes, 1998, TMH.

Reference Books:

- Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice-Hall Upper Saddle River, New Jersey
- Computer Organization, 5th Edi, by Carl Hamacher, Zvonko Vranesic,2002, Safwat Zaky.
- Structured Computer Organisation by A.S. Tanenbaum, 4th edition, Prentice-Hall of India, 1999, Eastern Economic Edition.
- Computer Organisation & Architecture: Designing for performance by W. Stallings, 4th edition, 1996, Prentice-Hall International edition.
- Computer Architecture & Organisation by M. Mano, 1990, Prentice-Hall.
- Computer Architecture- Nicholas Carter, 2002, T.M.H.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

IT – 204 N		Programming Languages				
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	1	-	75	25	100	3 Hour
Purpose	To introduce the principles and paradigms of programming languages for design and implement the software intensive systems.					
Course Outcomes						
CO 1	To study the syntax and semantics of programming language.					
CO 2	To know about the data type concept.					
CO 3	To study the control statement of programming language					
CO 4	To know about the storage management					

Unit-I:

Introduction, Syntax and Semantics Introduction: A brief history, characteristics of a good programming language, Programming language translators compiler & interpreters , 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. **Syntax& Semantics:** Introduction, general problem of describing syntax, formal method of describing syntax, attribute grammar .

Unit-II:

Structured data objects, Subprograms and Programmer Defined Data Types Structured data objects: Structured data objects & data types, 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.

Subprograms and Programmer Defined Data Types: Evolution of data type concept abstraction, encapsulation & information hiding, Subprograms, type definitions, abstract data types, over loaded subprograms, generic subprograms.

Unit-III:

Sequence Control and Data Control Sequence 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, Parameter & parameter transmission schemes.

Unit-IV:

Storage Management and Programming Languages Storage Management: 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.

Programming Languages: Introduction to procedural, non-procedural, structured, logical, functional and object oriented programming language, Comparison of C & C++ programming languages.

Text Books:

1. Terrence W. Pratt, Marvin V. Zelkowitz, Programming Languages design & Implementation, Pearson.
2. Allen Tucker & Robert Noonan, Programming Languages–Principles and Paradigms, Tata McGraw-Hill, 2009.

Reference Books:

1. Ellis Horowitz, Fundamentals of Programming Languages, Galgotia Publications, 2010.
2. C. Ghezzi, Programming Languages Concepts, Wiley Publications, 2010.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

Object Oriented Programming Using C++						
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	1	-	75	25	100	3 Hour
Purpose	To introduce the principles and paradigms of OOPS for design and implement the Object Oriented System					
Course Outcomes (CO)						
CO 1	To introduce the basic concepts of object oriented programming language and the its representation					
CO 2	To allocate dynamic memory, access private members of class and the behavior of inheritance and its implementation.					
CO 3	To introduce polymorphism, interface design and overloading of operator.					
CO 4	To handle backup system using file, general purpose template and handling of raised exception during programming					

Unit-1:

Introduction to C++, C++ Standard Library, Basics of a Typical C++ Environment, Pre-processors Directives, Illustrative Simple C++ Programs. Header Files and Namespaces, libraryfiles. Concept of objects, basic of object modeling, object classes, associations, behaviors, description, Object Oriented Analysis & Object Modeling techniques,

Object Oriented Concepts : Introduction to Objects and Object Oriented Programming, Encapsulation (Information Hiding), Access Modifiers: Controlling access to a class, method, or variable(public, protected, private, package), Other Modifiers, Polymorphism: Overloading,, Inheritance, Overriding Methods, Abstract Classes, Reusability, Class's Behaviors.

Classes and Data Abstraction: Introduction, Structure Definitions, Accessing Members of Structures, Class Scope and Accessing Class Members, Separating Interface from Implementation ,Controlling Access Function And Utility Functions, Initializing Class Objects: Constructors, Using Default Arguments With Constructors, Using Destructors, Classes : 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, Static Class Members, Container Classes And Integrators, Proxy Classes, Function overloading.

Unit-2:

Operator Overloading: Introduction, Fundamentals of Operator Overloading, Restrictions On Operators Overloading, Operator Functions as Class Members vs. as Friend Functions, Overloading, <<, >> Overloading Unary Operators, Overloading Binary Operators.

Inheritance: Introduction, Inheritance: Base Classes And Derived Classes, Protected Members, 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, Implicit Derived –Class Object To Base-Class Object Conversion, Composition Vs. Inheritance.

Unit-3:

Virtual Functions and Polymorphism: Introduction to Virtual Functions, Abstract Base Classes And Concrete Classes, Polymorphism, New Classes And Dynamic Binding, Virtual Destructors, Polymorphism, Dynamic Binding.

Files and I/O Streams: Files and Streams, Creating a Sequential Access File, Reading Data From A Sequential Access File, Updating Sequential Access Files, Random Access Files, Creating A Random Access File, Writing Data Randomly To a Random Access File, Reading Data Sequentially from a Random Access File. 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.

Unit-4:

Templates & Exception Handling: Function Templates, Overloading Template Functions, Class Template, Class Templates and Non-Type Parameters, Templates and Inheritance, Templates and Friends, Templates and Static Members.Introduction, Basics of C++ Exception Handling: Try Throw, Catch, Throwing an Exception, Catching an Exception, Re-throwing an Exception, Exception specifications, Processing Unexpected Exceptions, Constructors, Destructors and Exception Handling, Exceptions and Inheritance.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

Text Books:

- C++ How to Program by H M Deitel and P J Deitel, 1998, Prentice Hall
- Object Oriented Programming in Turbo C++ by Robert Lafore ,1994, The WAITE Group Press.
- Programming with C++ By D Ravichandran, 2003, T.M.H

Reference books:

- Object oriented Programming with C++ by E Balagurusamy, 2001, Tata McGraw-Hill
- Computing Concepts with C++ Essentials by Horstmann, 2003, John Wiley,
- The Complete Reference in C++ By Herbert Schildt, 2002, TMH.

IT-208 N	Operating Systems					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	1	-	75	25	100	3
Purpose	To familiarize how an operating system controls the computer					
Course Outcomes						
CO 1	To study about the process of Operating System and it's scheduling.					
CO 2	To learn about interprocess communication and deadlocks.					
CO 3	To learn about memory management and file system of operating system.					
CO 4	To learn about distributed system and device management.					

UNIT 1:

Introductory Concepts: Operating System functions and characteristics, historical evolution of operating systems, Real time systems, Distributed systems, Methodologies for implementation of O/S service , system calls, system programs , interrupt mechanisms.

Processes: Processes model, process states, process hierarchies, implementation of processes, data structures used such as process table, PCB creation of processes, context switching, exit of processes.

Process scheduling: objective, preemptive Vs non- preemptive scheduling, comparative assessment of different algorithms such as round robin, priority bases scheduling, FCFS, SJF, multiple queues with feedback.

UNIT 2:

Interprocess communication: Race conditions, critical sections, problems of mutual exclusion, Peterson's solution, producer-consumer problem, semaphores, counters, monitors, message passing.

Deadlocks: conditions, modeling, detection and recovery, deadlock avoidance, deadlock prevention.

UNIT 3:

Memory Management: Multiprogramming with fixed partition, variable partitions, virtual partitions, virtual memory, paging, demand paging design and implementation issues in paging such as page tables, inverted page tables, page replacement algorithms, page fault handling, working set model, local vs global allocation, page size, segmentation and paging.

File Systems: File type, attributes, access and security, file operations, directory structures, path names, directory operations, implementation of file systems, implementation of file and file operations calls, implementation of directories, sharing of files, disk space management, block allocation, free space management, logical file system, physical file system.

UNIT 4:

Device Management: Techniques for device management , dedicated devices, shred devices, virtual devices, device characteristics-hardware considerations: input and output devices, storage devices, independent device operation, buffering, multiple paths, device allocation considerations.

Distributed Systems: Introduction to II/W and S/W concepts in distributed systems, Network operating systems and NFS, NFS architecture and protocol, client- server model, distributed file systems, RPC- Basic operations, parameter passing, RPC semantics in presence of failures threads and thread packages.

Books recommended:

1. Peterson J L &Silberschatz , " Operating System concepts" Addison Wesley
2. Brinch, Hansen, "Operating System Principles" PHI
3. Tenanbaum A S " Operating System", PHI.

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

IT-210 N	Fundamentals of Microprocessor Interfacing & Application					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	1	-	75	25	100	3
Purpose	To learn the architecture and programming of Intel family microprocessors and its interfacing.					
Course Outcomes						
CO 1	To study the Architecture of 8085 microprocessors					
CO 2	Familiarization with the instruction / commands of 8085					
CO 3	Introduction to interfacing of microprocessor					
CO 4	Concept of data transfer among various peripheral devices					

Unit 1

Introduction of Microcomputer System

Introduction to Microcomputer based Systems

Architecture of 8-bit Microprocessor: Intel 8085 microprocessor, Pin description ; Internal architecture , Bus , register organization , Memory organization , Flags , stack , Timing and control unit, instruction cycle , machine cycle , Timing diagram for Fetch and Memory read / write

Unit 2

Programming of 8085

Instruction and data formats ; Instruction Set of 8085 ; introduction to Assembly Language Programming; Stacks and Subroutines ; counter and time delay .

Unit 3

Interfacing I/O devices

Basic interfacing concept ; Interfacing output displays ; Interfacing input devices ; Memory Mapped I/O ; Interrupt structure of 8085

Unit 4

Peripheral devices

An introduction to following devices :- a) Programmable Communication interface (8251) ; b) Programmable Peripheral Interface (8255) ; c) DMA controller (8237) , d) Programmable keyboard / Display interface (8279)

Microprocessor application : Interfacing of LCD , matrix keyboard , stepper motor, Introduction to Microprocessor Controlled Temperature System (MCTS)

Books

1. Ramesh S. Gaonkar, "Microprocessor Architecture, Programming and Application with the 8085", Penram International Publishing (India).
2. B Ram , "Fundamentals of Microprocessors And Microcontrollers" , Dhanpat Rai & sons

Reference Books

1. K. Ray and K M Bhurchandi, "Advanced Microprocessors and Peripherals", Tata McGraw-Hill
2. K Udaya Kumar , "The 8085 Microprocessor: Architecture, Programming and Interfacing" , Pearson education
3. N.K.Srinath , "8085 Microprocessor: Programming and interfacing" PHI 2005

Paper Setter's Note: 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

LIST OF EXPERIMENTS

- Q1. 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.
- Q2. A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example, (4,5) represents a point 4 units to the right of the origin along the X axis and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of the X coordinates of the points and whose Y coordinate is the sum of their Y coordinates. Write a program that uses a structure called `point` to model a point. Define three points, and have the user input values to two of them. Then set the third point equal to the sum of the other two, and display the value of the new point. Interaction with the program might look like this:
Enter coordinates for P1: 3 4
Enter coordinates for P2: 5 7
Coordinates of P1 + P2 are : 8, 11
- Q3. 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. 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.
Enter first number, operator, second number: 10/ 3
Answer = 3.333333
Do another (Y/ N)? Y
Enter first number, operator, second number 12 + 100
Answer = 112
Do another (Y/ N) ? N
- Q4. A phone number, such as (212) 767-8900, can be thought of as having three parts: the area code (212), the exchange (767) and the number (8900). Write a program that uses a structure to store these three parts of a phone number separately. Call the structure `phone`. Create two structure variables of type `phone`. Initialize one, and have the user input a number for the other one. Then display both numbers. The interchange might look like this:
Enter your area code, exchange, and number: 415 555 1212
My number is (212) 767-8900
Your number is (415) 555-1212
- Q5. 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 may be a `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 the object on display.
- Q6. Create a class `rational` which represents a numerical value by two double values- `NUMERATOR` & `DENOMINATOR`. Include the following public member Functions:
- constructor with no arguments (default).
 - constructor with two arguments.
 - void `reduce()` that reduces the rational number by eliminating the highest common factor between the numerator and denominator.
 - Overload `+` operator to add two rational number.
 - Overload `>>` operator to enable input through `cin`.

• Overload << operator to enable output through cout.

Write a main () to test all the functions in the class.

Q 7. Consider the following class definition

```
class father {
protected :int age;
public;
father (int x) {age = x;}
virtual void iam ( )
{ cout<< "I AM THE FATHER, my age is : "<< age<< end1;}
};
```

Derive the two classes son and daughter from the above class and for each, define I am () to write our similar but appropriate messages. You should also define suitable constructors for these classes. Now, write a main () that creates objects of the three classes and then calls I am () for them. Declare pointer to father. Successively, assign addresses of objects of the two derived classes to this pointer and in each case, call I am () through the pointer to demonstrate polymorphism inaction.

Q 8. Write a program that creates a binary file by reading the data for the students from the terminal.

The data of each student consist of roll no., name (a string of 30 or lesser no. of characters) and marks.

Q9. A hospital wants to create a database regarding its indoor patients. The information to store include

a) Name of the patient

b) Date of admission

c) Disease

d) Date of discharge

Create a structure to store the date (year, month and date as its members). Create a base class to store the above information. The member function should include functions to

enter information and display a list of all the patients in the database. Create a derived class to store the age of the patients. List the information about all the to store the

age of the patients. List the information about all the pediatric patients (less than twelve years in age).

Q 10. 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 **to String** 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.

Q11. Imagine a tollbooth with a class called toll Booth. The two data items are 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 paying Car () increments the car total and adds 0.50 to the cash total. Another function, called nopayCar (), increments the car total but adds nothing to the cash total. Finally, a member function called displays the two totals. Include a program to test this class. This program should allow the user to push one key to count a paying car, and another to count a nonpaying car. Pushing the ESC key should cause the program to print out the total cars and total cash and then exit.

Q12. Write a function called reversit () that reverses a string (an array of char). Use a for loop that swaps the first and last characters, then the second and next to last characters and so on. The string should be passed to reversit () as an argument. Write a program to exercise reversit (). The program should get a string from the user, call reversit (), and print out the result. Use an input method that allows embedded blanks. Test the program with Napoleon's famous phrase, "Able was I ere I saw Elba".

Q13. Create some objects of the string class, and put them in a Deque-some at the head of the Deque and some at the tail. Display the contents of the Deque using the for Each() function and a user written display function. Then search the Deque for a particular string, using the first That () function and display any strings that match. Finally remove all the items from the Deque using the getLeft () function and display each item. Notice the order in which the items are displayed: Using getLeft (), those inserted on the left (head) of the Deque are removed in "last in first out" order while those put on the right side are removed in "first in first out" order. The opposite would be true if getRight () were used.

Q 14. Assume that a bank maintains two kinds of accounts for customers, one called as savings account and the other as current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed.

Create a class account that stores customer name, account number and type of account. From this derive the classes cur_acct and sav_acct to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks:

- a) Accept deposit from a customer and update the balance.
- b) Display the balance.
- c) Compute and deposit interest.
- d) Permit withdrawal and update the balance.
- e) Check for the minimum balance, impose penalty, necessary and update the balance.
- f) Do not use any constructors. Use member functions to initialize the class members.

Q 15. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get_data () to initialize baseclass data members and another member function display_area () to compute and display the area of figures. Make display_area () as a virtual function and redefine this function in the derived classes to suit their requirements. Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively and display the area. Remember the two values given as input will be treated as lengths of two sides in the case of rectangles and as base and height in the case of triangles and used as follows:

Area of rectangle = $x * y$

Area of triangle = $\frac{1}{2} * x * y$

.....

Microprocessors and Interfacing Lab
Paper code- IT-214 N

L T P
-- 2

Sessional: 40 Marks
Exam: 60 Marks
Total: 100 Marks
Duration of Exam: 3 Hrs.

LIST OF EXPERIMENTS

1. Study of 8085 Microprocessor kit.
2. Write a program using 8085 and verify for :
 - a. addition of two 8-bit numbers result is 8 bit
 - b. addition of two 8-bit numbers result is 16 bit.
3. Write a program using 8085 and verify for :
 - a. 8-bit subtraction
 - b. 16-bit subtraction
4. Write a program using 8085 for multiplication of two 8- bit numbers by repeated addition method. Check for minimum number of additions and test for typical data.
5. Write a program using 8085 for multiplication of two 8- bit numbers by bit rotation method
6. Write a program using 8085 for division of two 8- bit
7. Write a program using 8085 for dividing two 8- bit numbers by bit rotation method and test for typical data.
8. Shift an 8 bit number left by 2 bits.
9. Find 2's compliment of an 8bit and 16 bit number
10. To find larger of two numbers.
11. To find square-root of a number
12. Rolling display "HELLO WORLD" on the address and data field of screen
13. Write a program to control the operation of stepper motor using 8085
14. Write a program to interface adc & dac with 8085 & demonstrate generation of square wave.

Note : A student has to perform at least ten experiments. Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

Computer Hardware & Troubleshooting Lab
Paper code - IT-216 N

L T P
-- 2

Sessional: 40 Marks
Exam: 60 Marks
Total: 100 Marks
Duration of Exam: 3 Hrs.

LIST OF EXPERIMENTS

1. To solder and de-solder various components.
2. To check and measure various supply voltages of PC.
3. To make comparative study of motherboards: 386, 486, PI, PII, PIII.
4. To observe and study various various cables, connections and parts used in computer communication.
5. To study various cards used in a system viz., display card, LAN card etc.
6. To remove, study and replace floppy disk drive.
7. To remove, study and replace hard disk.
8. To remove, study and replace CD ROM drive.
9. To study monitor, its circuitry and various presets and some elementary fault detection.
10. To study printer assembly and elementary fault detection of DMP and laser printers.
11. To observe various cables and connectors used in networking.
12. To study parts of keyboard and mouse.
13. To assemble a PC.
14. Troubleshooting exercises related to various components of computer like monitor, drives, memory, and printers etc.

Books

1. Mark Mines Complete PC upgrade & maintenance guide. BPB publications.
2. Craig Zacker & John Rouske, PC Hard ware : The Complete Reference TMH.
3. Scott Mueller, Upgrading and Repairing PCs. PHI, 19

Programming with MATLAB
Paper code - IT-218 N

L T P
-- 2

Sessional: 40 Marks
Exam: 60 Marks
Total: 100 Marks
Duration of Exam: 3 Hrs.

1. To study MATLAB environment and to familiarize with Command Window, History, Workspace, Current Directory, Figure window, Edit window, Shortcuts, Help files.
2. Data types, Constants and Variables, Character constants, operators, Assignment statements.
3. Control Structures: For loops, While, If control structures, Switch, Break, Continue statements Input-Output functions, Reading and Storing Data.
4. Write a MATLAB program to calculate the following expression and round the answers to the nearest integer.
 - a) $z = 5x^2 + y^2$ where $x = 2, y = 4$
 - b) $z = 3\sin(x) + 4\cos(x) + 3e^y$ where $x = \pi/3, y = 2$
5. Vectors and Matrices, commands to operate on vectors and matrices, matrix Manipulations.
6. Arithmetic operations on Matrices, Relational operations on Matrices, Logical operations on Matrices.
7. If $x = [1 \ 4; 8 \ 3]$, find :
 - a) the inverse matrix of x .
 - b) the transpose of x .
 - c) Determinant of x
8. Polynomial Evaluation, Roots of Polynomial, Arithmetic operations on Polynomials.
9. Graphics: 2D plots, Printing labels, Grid & Axes box, Text in plot, Bar and Pie chart
10. To plot a sine wave of frequency 1Khz
11. Study of Simulink
12. To implement a simple calculator as a GUI
13. Solve the following system
$$\begin{aligned}x + y - 2z &= 3 \\2x + y &= 7 \\x + y - z &= 4\end{aligned}$$
14. Write a program to read three bits x, y, z , then compute:
 - a) $v = (x \text{ and } y) \text{ or } z$
 - b) $w = \text{not}(x \text{ or } y) \text{ and } z$
15. Represent the following complex numbers in polar coordinate
 $Z = 3 + 4j$

Note: A student has to perform at least ten experiments. Seven experiments should be performed from the above list. Remaining experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

		MPC- 201N	ENVIRONMENTAL STUDIES		
L	T	P	Sessional	Exam	Time
3	-	-	25	75	3H

UNIT I

The multidisciplinary nature of environmental studies. Definition, Scope and Importance. Need for public awareness. Natural Resources: Renewable and Non-Renewable Resources: Natural resources and associated problems.

(a) Forest Resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

(b) Water Resources- Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

(c) Mineral Resources- Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

(d) Food Resources- World Food Problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

(e) Energy Resources- Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

(f) Land Resources- Land as a resource, land, degradation, man induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyle.

UNIT II

Ecosystem- Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem. Ecological succession, Food Chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem.

a. Forest Ecosystem

b. Grassland Ecosystem

c. Desert Ecosystem

d. Aquatic Ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Field Work: Visit to a local area to document Environment assets-river/forest/grassland/ hill/ mountain. Visit to a local polluted site- Urban /Rural/Industrial/Agricultural. Study of common plants, insects and birds. Study of simple ecosystems-pond, river, hill, slopes etc. (Field work equal to 5 lecture hours).

UNIT III

Biodiversity and its conservation. Introduction, Definition: genetic, species and ecosystem diversity. Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity of global, National and local levels. India as a mega-diversity nation Hot spots of Biodiversity. Threats to biodiversity: Habitat loss, poaching of wild life, man-wildlife conflicts. Endangered and endemic species of India. Conservation of Biodiversity- In situ and Ex-Situ conservation of biodiversity.

Environmental Pollution: Definition, Cause, effects and control measures of- (a) Air Pollution (b) Water Pollution (c) Soil Pollution (d) Marine Pollution (e) Noise Pollution (f) Thermal Pollution (g) Nuclear Hazards

Solid waste management- cause, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management: floods, earthquake, cyclone and landslides

UNIT IV

Social Issues and the Environment, From unsustainable to sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management.

Resettlement and rehabilitation of people: Its problems and concerns. Case Studies. Environmental ethics-issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies.

Wasteland Reclamation, Consumerism and waste products, Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public Awareness, Human population and the Environment, Population growth, variation among nations. Population explosion-Family Welfare Programme, Environment and human health, Human rights, Value Education, HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and Human Health, Case Studies.

Suggested Text Books & References:

1. Environmental Studies- Deswal and Deswal. Dhanpat Rai & Co.
2. Environmental Science & Engineering Anandan, P. and Kumaravelan, R. 2009. Scitech Publications (India) Pvt. Ltd., India
3. Environmental Studies. Daniels Ranjit R. J. and Krishnaswamy. 2013. Wiley India.
4. Environmental Science- Botkin and Keller. 2012. Wiley, India.

KURUKSHETRA UNIVERSITY KURUKSHETRA
SCHEME OF STUDIES / EXAMINATIONS

Bachelor of Technology (Information Technology)

Semester – V (w.e.f. Session 2017-18)

S. No.	Course No.	Course Title	Teaching Schedule				Allotment of Marks				Duration of Exam (Hrs.)
			L	T	P	Hours/Week	Theory	Sessional	Practical	Total	
1.	IT-301N	Linux Operating System	4	1	--	5	75	25	--	100	3
2.	IT-303N	Introduction to Digital & Data Communication	4	--	--	4	75	25	--	100	3
3.	IT-305N	JAVA Programming	4	1	--	5	75	25	--	100	3
4.	IT-307N	Multimedia & Virtual Reality	4	--	--	4	75	25	--	100	3
5.	IT-309N	Computer Graphics	4	1	--	5	75	25	--	100	3
6.	IT-311N	Computer Graphics Lab	--	--	3	3	---	40	60	100	3
7.	IT-313N	Multimedia Lab	--	--	2	2	---	40	60	100	3
8.	IT-315N	JAVA Programming Lab	--	--	3	3	---	40	60	100	3
9.	IT-317N	Linux Lab	----	--	2	2	--	40	60	100	3
10.	IT-319N	Industrial Training-I	1	--	---	1	---	100	----	100	
		Total	21	3	10	34	375	385	240	1000	

Note: Industrial Training which was undergone by the students after IV sem is to be evaluated during V sem as (IT-319N) through submission of certified computerized report to the Head of the Department followed by viva-voce, seminar/presentation.

Semester – VI (w.e.f. Session 2017-18)

S. No.	Course No.	Course Title	Teaching Schedule				Allotment of Marks				Duration of Exam (Hrs.)
			L	T	P	Hours/Week	Theory	Sessional	Practical	Total	
1.	IT-302N	Analysis & Design of Algorithms	4	1	-	5	75	25	--	100	3
2.	IT-304N	Software Engineering	4	--	-	4	75	25	--	100	3
3.	IT-306N	Computer Networks	4	--	--	4	75	25	--	100	3
4.	IT-308N	Introduction to Microcontroller	4	--	--	4	75	25	--	100	3
5.	IT-310N	Data Warehouse & Data Mining	4	1	--	5	75	25	--	100	3
6.	IT-312N	Software Engineering Lab	---	--	2	2	---	40	60	100	3
7.	IT-314N	Networking Lab	--	--	2	2	---	40	60	100	3
8.	IT-316N	Visual Basic.net Lab	--	--	3	3	---	40	60	100	3
9.	IT-318N	Microcontroller Lab	--	--	2	2	---	40	60	100	3
10.	IT-320N	Colloquium & Professional Proficiency	---	--	2	2	--	100	--	100	--
		Total	20	2	11	33	375	385	240	1000	--

Note: The students will have to undergo another six weeks Industrial Training after VI sem and it will be evaluated during VII sem through submission of certified computerized report to the Head of the Department followed by viva-voce, seminar/presentation.

IT-301 N	Linux Operating System					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	The course helps students to prepare for the real world in which there is a diversity of operating system & platform.					
CO 1	To familiarize with basic commands of Linux.					
CO 2	To study Linux networking and file system.					
CO 3	To understand the installation of server.					
CO 4	Security in Linux.					

Unit-1

Introduction: Basic concepts of the operating system. Commands, shells and processes; users and groups; file system and directories. System installation, configuration and upgrade Installation stages; network installation; disk partitioning; post-install system customization and upgrade; dpkg and APT package installation, remove, upgrade and query; semiautomatic system installation.

Kernel: Kernel tasks; managing kernel modules at runtime; kernel configuration and compilation boot loaders GRUB and LILO.

Unit-2

Linux Networking: Basic concepts of networking: Network packets, TCP/IP protocol suit, address resolution protocol (ARP); IP addresses and network mask; subnets and routing; IPV4 and Network classes; ports. Configuring Linux machine on the network; arp, ipconfig and netstat commands. Network services and tools; telnet, rsh, ftp, rcp, ssh, rsync, inetd.conf; opening and closing ports.

Network File system (NFS): File system sharing or the network; remote procedure call (R P C) services; NFS server and client sides; NFS installation & configuration; and statistic mount and auto mount configuration; when trouble shooting NFS; security and optimization

Network information service (NIS): Centralized authentication systems; sharing user and host information or the network; IS server and client sides and configuration; compatibility mode; net group; security issues.

Unit –3

Integrating Linux and Windows: Elements of windows networking; Net BIOS SMB\ \ CIFS protocols; domain controller; Samba server on Linux for centralized window logon; file sharing and printing, samba client; samba installation and configuration; Unix and windows password. Dual Boot: running windows and Linux on the same PC; GRUB and NT Boot loaders; accessing windows files systems from Linux and vice versa;

Light Weight Directory Access Protocol (LDAP): Overview of Unix authentication and naming service; introduction to LDAP: Domain component (DC); organizational Unit (OU); common names (CN); Schemas; IDIF format; services; polls and commands; server and client sides; Open LDAP installation and configuration; LDAP applications. Shell scripting, syntax of brash; looping; case statement; function; command substitution; awk, grep, sed. Startup and Run Levels. Scheduled jobs. Boot up and login process sequence; run levels; startup scripts; scheduling jobs with at and cron.

Unit-4

Linux Security: System vulnerabilities; port scanning; encryption, encrypted services and connections; PGP/GPG Intrusion protection: tcp-wrappers, IP-firewalls (iptables), NAT and DMZ; Intrusion detection systems: tripwire; Secure system management practices.

Email Server: Steps of Email transaction; Email envelope and headers; SMTP servers; IMAP and POP3 servers; E-mail relay; Postfix configuration; Spam and viruses,

Domain Name Server (DNS): Host name resolution; domain name hierarchy; DNS zones; configuration of master, slave and caching DNS servers with BIND 9.

Text Books

1. Bell & Duff , *Red Hat Linux 9* — Pearson.
2. Richard L. Peterson , *Complete Reference, Red Hat Linux*—TMH.
3. Tery Dawson, Gregor N. Purdy, Tony Bautts ; *Linux N/W Administration Guide*– OREILLY.

Reference Books

1. Christopher Negus , *Red Hat Linux 9 Bible*- WILEY publishing.
2. Patrick Volker Ding, Kevin Richard, Eric Foster-Johnson, *Linux Configuration & Installation* BPB publication.
3. John Goerzen, *Linux Programming Bible* -Wiley Dream Tech India (P) Ltd.

NOTE: Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT - 303 N	Introduction to Digital & Data Communication					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	--	--	75	25	100	3
Purpose	To provide the knowledge of digital data communication					
CO 1	To introduce the concept of communication.					
CO 2	To study pulse modulation.					
CO 3	To educate about the various modulation techniques in digital communication					
CO 4	To understand various methods for data transmission.					

Unit-1

Introduction

What is communication , Elements of communication system , Signal , Concept of bandwidth , sources of signal , Types of communication channels , classification of electronic communication system , Modulation , Introduction to analog modulation system – AM , FM , PM ; Elements of Digital communication system , Comparison of analog and digital modulation , advantages and disadvantages of digital communication , Limitations of communication system , Electromagnetic spectrum for communication

Unit-2

Pulse Modulation:

Sampling theorem, Nyquist rate, Introduction to PAM, PWM, PPM; Quantization, Introduction to PCM and delta modulation, Introduction to TDM and FDM

Unit-3

Digital Modulation

Line coding, introduction to Encoding schemes: RZ , NRZ ; Modulation Techniques – ASK-FSK-PSK-QPSK

Unit-4

Digital data Transmission

Classification: Parallel, Serial, Asynchronous and synchronous transmission; Error Detection and correction techniques: Parity checks, Hamming code; DTE & DCE interface, Introduction to: a) RS-232C, b) RS-449, c) USB , d) HDMI.

Text Books:

1. Proakis, "Digital Communications", Mc Graw Hill.
2. Sanjay Sharma , " Digital communication" , S.K. Kataria and sons

Reference Books :

1. W.Stalling, "Wireless Communication And Networks" , Pearson.
2. Stallings, "Data & computer Communications", PHI.
3. Forouzen, "Data Communication & Networking", Tata Mcgraw Hill.
4. Miller, "Introduction to Digital & Data Communications", Jaico Pub.

NOTE: The course is introductory in nature. Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-305 N	JAVA Programming					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To understand design and implementation of various software applications.					
CO 1	To study basic concept of OOP.					
CO 2	Learn about the interfaces, multithreading in JAVA.					
CO 3	To study database connectivity with JAVA.					
CO 4	To familiarize the student to server side programming.					

Unit-1

Introduction to Java & Principles of Object Oriented Programming: Basic Concepts of OOP and it's Benefits. Application of OOP. The Creation of Java, Importance of Java for the Internet, Java's Magic: The Byte-code, Features of Java. Object-Oriented Programming in Java, Java Program Structure.

Defining Classes: Defining of a Class, Definition of Methods, Constructors, Creating Objects of a Class, Assigning Object Reference Variables, The keyword "this", Defining and Using a Class, Automatic Garbage Collection.

Arrays and Strings: Arrays, Arrays of Characters, String handling Using String Class, Operations on String Handling Using String Buffer Class.

Extending Class and Inheritance: Using Existing Classes, Class Inheritance, Choosing Base Class, Access Attributes, Polymorphism, Multiple Levels of Inheritance, Abstraction through Abstract Classes, Using Final Modifier, The Universal Super class-Object Class.

Unit-2

Package & Interfaces: Understanding Packages, Defining a Package, Packaging up your Classes, Adding Classes from a Package to your Program, Understanding CLASSPATH, Standard Packages, Access Protection in Packages, Concept of Interface.

Exception Handling: The Idea behind Exceptions, Types of Exceptions, Dealing with Exceptions, Exception Objects, Defining Your Own Exceptions, Checked and Unchecked Exceptions.

Multithreading Programming: The Java Thread Model, Understanding Threads, The Main Thread, Creating a Thread: extending Thread and implementing Runnable, Creating Multiple Threads, Thread Priorities, Synchronization, Deadlocks inter-thread communication, Deadlocks.

Input/Output in Java: I/O Basic, Byte and Character Structure, I/O Classes, Reading Console Input, Writing to Console Output, Reading and Writing on Files, Random Access Files, Storing and Retrieving Objects from File. Stream Benefits.

Unit-3

Creating Applets in Java: Applet Basics, Applets Architecture, Applet Life Cycle, Simple Applet Display Methods, Requesting Repainting, Using the Status Window, The HTML APPLET Tag, Passing parameters to Applets.

Java Data Base Connectivity (JDBC): Database Connectivity- Relation Databases, JDBC API, Reusing Database Objects, Transactions, Advance Techniques.

Working with Windows: AWT Classes, Window Fundamentals, Working with Frame, Creating a Frame Window in an Applet, displaying information within a Window.

Unit-4

Event Handling: Two Event Handling Mechanisms, The Delegation Event Model, The Event Handling Process, Event Classes, Sources of Events, event Listener Interfaces, Using the Delegation Event Model, Adapter Classes.

Java Servlet Programming: Role and Advantages of Java Servlets in Web application Development.

HTTP Servlets- Introduction, page generation, server side includes, servlet chaining, java Server pages.

Server Life Cycle: Servlet Alternative, Reloading, Init and Destroy, Single Thread Model, Background Processing Last Modified times, synchronization, Persistent state capabilities.

Text Books / Reference:

1. Herbert Schildt , *The complete Reference Java*, Mc Graw.
2. Ivor Horton , *Beginning JAVA 2 (JDK1.3 Edition)* , WROX Public.
3. Bruce Eckel , *Thinking in Java*, Prentice Hall.
4. Jamie Jaworski, "*Java Unleashed*", SAMS Techmedia Publication, 1999.
5. JAVA 2 (1.3) API Documentations.
6. E. Balaguruswamy , "*Programming with Java*" , Tata McGraw-Hill Education.

NOTE: Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-307 N	Multimedia & Virtual Reality					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	-	-	75	25	100	3
Purpose	To familiarize with different techniques and tools of multimedia applications.					
CO 1	Introduction to basics of multimedia technologies.					
CO 2	To study file system and information model of multimedia.					
CO 3	To familiarize with the animation in multimedia.					
CO 4	To study the virtual reality concepts.					

UNIT - 1

Basics of Multimedia Technology: Computers, communication and entertainment, multimedia an introduction & emerging applications, framework for multimedia systems, multimedia devices, CD-AUDIO, CD_ROM, multimedia presentation tools.

Audio, Video And Image: Digital representation of sound, transmission of digital sound, MPEG-Audio ,audio compression and decompression, brief survey of speech recognition and generation, musical instrument digital interface, evaluating a compression system-redundancy and visibility , video compression techniques, JPEG-image compression standards, MPEG-motion video compression standard-DVI Technology

UNIT - 2

Multimedia File Systems and Information Models: The case of multimedia information system, file support for continuous media-data models for multimedia and hyper media information, multimedia presentation and authoring, current state of industry-design paradigms and user interface-barriers to widespread use, multimedia system service architecture, media stream protocol and services and window system, client control of continuous media, file system support, hyper applications.

UNIT - 3

Multimedia Communication Systems: Multimedia services over the public network, requirements, architecture and protocols-applications-network services-network protocols-multimedia interchange :Quicktime movie file format(QMF)-MHEG(Multimedia and Hypermedia information and coding expert group)-format function and representation summary-real time interchange-Multimedia conferencing: teleconferencing systems.

Animation: Introduction, Basic terminology techniques, Motion graphics 2D & 3D animation. Introduction to MAYA (Animating tool): Fundamentals, Modeling: NURBS, Polygon, Organic, animation, paths & boxes, deformers, working with MEL: Basics & programming Rendering & special effects: shading & texturing surfaces lighting, special effects.

UNIT - 4

Virtual Reality: Introduction to Virtual Reality, Four key elements of virtual reality - a) virtual world, b) immersion, c) sensory feedback d) interactivity, ; Desktop virtual reality, VR operating system, virtual environment displays & orientation making; visually coupled system requirements; intelligent VR software systems.

Text Books:

1. David Hillman , "*Multimedia Technology & Applications*", Galgotia publications.
2. John.F.Koegel Buford, *Multimedia Systems*, Pearson education, 1994.
3. John Villamil Louis Molina , *Multimedia An Introduction* PHI.
4. Jose Lozano , *Multimedia: Sound & video*, PHI(Que)
5. Sherman & Craig. *Understanding Virtual Reality – Interface, Application, and Design*, Morgan Kaufmann, 2002.

Reference Books:

1. John Villamil *Multimedia : Production, planning and delivery* , Que E&T, 1997.
2. Jeff Coate Judith , "*Multimedia in Action*", 1995, PHI.
3. Norman Desmarais, *Multimedia on the PC: A Guide for Information Professionals*, Mc Graw Hill.
4. Ze-Nian Li and Mark S.Drew, *Fundamentals of Multimedia* , Pearson education.

NOTE: Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-309 N	Computer Graphics					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To provide the conceptual knowledge of Computer Graphics.					
CO 1	Introduction to different graphics algorithm.					
CO 2	To acquaint with viewing system and clipping.					
CO 3	To study different transformation techniques and projection of an object.					
CO 4	To familiarize with 3D curves and surfaces.					

Unit – 1

Introduction: What is Computer Graphics, Computer Graphics Applications, Two dimensional Graphics Primitives: Points and Lines, Point Plotting Techniques: Coordinate system, Incremental Method, Line drawing algorithms: DDA & Bresenham's; Circle generating algorithms: Using polar coordinates, Mid point circle drawing algorithms . Filled area algorithms: Scan line polygon filling algorithms, Boundary filled algorithms.

Graphic devices: Light pen, Mouse, Tablet, Touch panel, Digitizers

Unit – 2

Two Dimensional Viewing: Two dimensional geometric transformations, Viewing pipeline, Window to view port transformation, Window to view port mapping.

Clipping: Point & Line clipping algorithm, Cohen-Sutherland Line clipping algorithms, Polygon clipping: Sutherland-Hodgeman Polygon clipping algorithm. Curve clipping, Text clipping.

Unit – 3

Three Dimensional Viewing: Introduction to Three-dimensional display methods : Parallel & Perspective Projection , depth cueing , surface rendering ; Three-Dimensional Geometric and Modeling Transformations; Viewing pipeline, Viewing coordinates,.

Unit – 4

Representation of 3-D Curves and Surfaces: Curved lines and surfaces, spline representations, interpolation and approximation splines, Parametric continuity conditions, Geometric continuity conditions.

Bezier curves and surfaces: Bezier curves, properties of Bezier curves, Bezier surfaces, B-spline curves and surfaces.

Hidden Surfaces removal: Classification of Visible-Surface Detection algorithms , Hidden surface elimination, depth buffer algorithm, scan line coherence and area coherence algorithm, priority algorithm.

Introduction to animation: Design of Animation Sequences, General Computer-Animation Functions, Morphing

Text Books

1. Hern & Baker – *Computer Graphics*, 2nd Ed. PHI.
2. Newmann & Sprawl – *Introduction to interactive Computer Graphics*, MGH.

Reference Books

1. Harrington – *Computer Graphics – A programming Approach*.
2. Rogers – *Principles of Computer Graphics – MGH*.
3. Foley – *Fundamental of Interactive Computer Graphics – Addison Welsey*

NOTE: The course is introductory in nature. Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-311 N	Computer Graphics Lab					
Lecture	Tutorial	Practical	Minor Test	Practical Exam	Total	Time
--	--	3	40	60	100	3
Purpose	To provide the conceptual knowledge of Computer Graphics.					
CO 1	To implement different graphics algorithm.					
CO 2	To perform practical on viewing system and clipping.					
CO 3	To study different transformation techniques and projection of an object.					
CO 4	To implement Beizer curve					

List of experiments:

1. Write a program to implement DDA line drawing algorithm.
2. Write a program to implement Bresenham's line drawing algorithm.
3. Implement the Bresenham's circle drawing algorithm.
4. Write a program to implement the midpoint circle drawing algorithm.
5. Write a program to implement 2-D transformations.
6. Write a program to show a ball moving on the screen according to the given requirements.
7. Write a program to implement the midpoint circle drawing algorithm.
8. Write a program to implement the Beizer curve.
9. Implement the line clipping algorithm using C.
10. Implement boundary fill algorithm using C.
11. Implement the depth buffer algorithm using C.

Note: A student has to perform 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-313 N	Multimedia Lab					
Lecture	Tutorial	Practical	Minor Test	Practical Exam	Total	Time
--	--	2	40	60	100	3
Purpose	To familiarize different techniques and tools of multimedia applications.					
CO 1	Introduction to basics of multimedia technologies.					
CO 2	Creation of websites					
CO 3	To study animation in multimedia.					
CO 4	To use adobe photoshop for editing.					

List of experiments:

1. Create any two slides using power point
2. Create a website on any of your favorite topic.
3. Create a website of your college using HTML tags
4. Perform the following using Movie star:
 - a) Video Capturing
 - b) Video Editing and
 - c) Creating Video CD.
5. Animate a ball using Flash
6. Using Adobe Deluxe Photoshop edit a digital photo by changing the background color, changing the theme, changing the part of the photo and editing the different parts of the photo.
7. Animate the following using GIF animator:
 - a) Image
 - b) Banner Text
8. Perform the following using Multimedia Software:
 - a) Clip a portion of an audio wave file
 - b) Add another audio file to the above clipped file
9. Perform the following using Multimedia software
 - a) Extract audio from video file like .avi/.dat/.mpeg and save it in MP3
 - b) Change the format of above audio file into midi/wav/asf/wm/cda

Note: A student has to perform 9 experiments. At least seven experiments should be performed from the above list. Two experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-315 N	JAVA Programming Lab					
Lecture	Tutorial	Practical	Minor Test	Practical Exam	Total	Time
--	--	3	40	60	100	3
Purpose	To introduce the principles and paradigms of Java Programming.					
CO 1	Introduction to the concept of OOP.					
CO 2	To implement various programs in JAVA					
CO 3	To study database connectivity with JAVA.					
CO 4	To study server side programming					

List of experiments:

1. Write a program to illustrate the concept of simple and multilevel inheritance.
2. Write a program to illustrate the concept of "this" keyword.
3. Write a program to illustrate the concept of Constructor and method Overloading.
4. Write a program to draw a Pyramid in JAVA.
5. Write a program to implement Binary Search.
6. Write a program to illustrate the concept of Threads by using yield (), stop (), and sleep () methods.
7. Write a program to illustrate the concept of synchronization in Threads.
8. Write a program to illustrate the concept of applets.
9. Write a program to draw shapes using Graphics Methods
10. Write a program to read a record into database using JDBC Connectivity.
11. Write a program to illustrate the concept of Event Handling

Note: A student has to perform 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-317 N	Linux Lab					
Lecture	Tutorial	Practical	Minor Test	Practical Exam	Total	Time
--	--	2	40	60	100	3
Purpose	To introduce the student to Linux OS					
CO 1	To explore basic commands of Linux.					
CO 2	To study Linux networking and file system.					
CO 3	To learn installation of server.					
CO 4	To familiarize with administration of Linux operating system					

LIST OF EXPERIMENTS

1. Install Linux on the system dual boot with the windows Operating System.
2. Do the following tasks :-
 - a) Create, remove & resize various types of partitions through GUI as well as command line.
 - b) Configure printers in Linux through GUI as well as command line.
3. Creating, Removing of Swap space as well as swap files through command line as well as GUI.
4. Implementation Disk Quotas- enabling, creating, mounting, configuring, assigning, disabling.
5. Managing Users and Groups in Linux- Adding, Modifying, Password aging.
6. Configuration Networks on Linux through GUI & Command Line- Ethernet, Modem, ISDN, Wireless.
7. Configuring NFS (Network File System) on Linux both GUI & Command Line.
8. Configuring Samba server on Linux both GUI & Command line.
9. Configuring D.N.S (Domain Name system) server on Linux both GUI & Command Line.
10. Configure an e-mail server in Linux-send mail.
11. Configuring Firewalls and managing various services of Linux.
12. Configuring Log Server in Linux.

Note: A student has to perform 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-302 N	Analysis & Design of Algorithms					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To explore fundamentals of algorithm design.					
CO 1	To study the behavior of an algorithm.					
CO 2	To familiarize with dynamic programming.					
CO 3	To focus on back tracking and branch and bound problems.					
CO 4	To learn the computational graph searching and tree traversals.					

Unit – 1

Introduction: Algorithm, Analyzing algorithm, Designing algorithm, Concept of algorithmic efficiency, Run time analysis of algorithms, Asymptotic Notations.

Divide and conquer: Structure of divide and conquer algorithms: examples; binary search, quick sort, Strassen Multiplication; Analysis of divide and conquer run time recurrence relations.

Unit – 2

Greedy Method: Overview of the greedy paradigm examples of exact optimization solution (minimum cost spanning tree), approximate solution (Knapsack problem), Singles source shortest paths.

Dynamic programming: Overview, difference between dynamic programming and divide and conquer, Applications: Shortest path in graph, Matrix multiplication, Travelling salesman problem, longest common sequence.

Unit – 3

Back tracking: Overview, 8-queen problem, and Knapsack problem

Branch and bound: LC searching Bounding, FIFO branch and bound, LC branch and bound application: 0/1 Knapsack problem, Traveling Salesman Problem.

Unit – 4

Graph searching and Traversal: Overview, Traversal methods (depth first and breadth first search).

Trees: Review of trees, Binary search tree, Traversal, Insertion & Deletion in Binary Search Tree, B-Trees, B+Trees, Basic operations on B Trees.

Computational Complexity: Complexity measures, Polynomial Vs non-polynomial time complexity; NP-hard and NP-complete classes, examples.

Text Book:

1. E. Horowitz, S. Sahni, and S. Rajsekran, “*Fundamental of Computer Algorithms*,” Galgotia Publication

Reference Books:

1. T. H. Cormen, Leiserson, Revest and Stein, “*Introduction of Somputer algorithm*,” PHI.
2. Sara Basse, A. V. Gelder, “*Computer Algorithms*,” Addison Wesley.

NOTE: Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-304 N	Software Engineering					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	--	--	75	25	100	3
Purpose	To familiarize the students with the concept of designing the software.					
CO 1	To study different software life cycle model.					
CO 2	To acquaint with requirement analysis and designing phase of software development.					
CO 3	To learn different testing and maintenance in software engineering					
CO 4	To explore quality assurance and reliability of the software.					

Unit – 1

Introduction: Program vs. software products, emergence of software engineering, software life cycle, models: waterfall, prototype, evolutionary and spiral model, Software Characteristics, Applications, Software crisis.

Software project management: Project management concepts, software process and project metrics Project planning, project size estimation metrics, project estimation techniques, empirical estimation techniques, COCOMO, A Heuristic estimation techniques, staffing level estimation, team structures, staffing, risk analysis and management, project scheduling and tracking.

Unit – 2

Requirements Analysis and specification: Requirements engineering, system modeling and simulation Analysis principles modeling, partitioning Software, prototyping, Prototyping methods and tools, Specification principles, Representation, the software requirements specification and reviews Analysis 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 control and process specification, The data dictionary, Other classical analysis methods.

System Design: Design concepts and principles: the design process: Design and software quality, design principles, 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; The design model; Design documentation. Architectural Design: Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, Analyzing alternative Architectural Designs, architectural complexity; Mapping requirements in to software architecture; Transform flow, Transaction flow; Transform mapping; Refining the architectural design.

Unit – 3

Testing and maintenance: Software Testing Techniques, software testing fundamentals: objectives, principles, testability; Test case design, Unit testing: white box testing, basic path testing: Control structure testing: Black box testing, testing for specialized environments, architectures and applications. Software Testing Strategies: Verification and validation, Integration testing, Validation testing, alpha and beta testing. System testing: Recovery testing, security testing, stress testing performance testing; The art of debugging process debugging approaches. Software re-engineering: Reverse engineering, restructuring, forward engineering.

Unit – 4

Software Reliability and Quality Assurance: Quality concepts, Software quality assurance, SQA activities; Software reviews: cost impact of software defects, defect amplification and removal; formal technical reviews: The review meeting, review reporting and record keeping, review guidelines; Formal approaches to SQA; Statistical software quality assurance; software reliability: Measures of reliability and availability, The ISO 9000 Quality standards, SEI-CMM Capability Maturity Model.

Computer Aided Software Engineering: CASE, building blocks, integrated case environments and architecture, repository.

Text Books:

1. Roger S. Pressman, *Software Engineering – A Practitioner’s Approach*, , 1966, MGH.
2. Rajib Mall , *Fundamentals of software Engineering*, , PHI

Reference Books:

1. Pankaj Jalote, *An Integrated Approach to Software Engineering* 1991 Narosa.
2. Ian Sommerville , *Software Engineering* , Pearson Edu, 5th edition, 1999, AW.
3. Ali Behforooz and Frederick J. Hudson. *Software Engineering Fundamentals*, Oxford University,

NOTE: Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-306 N	Computer Networks					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	--	-	75	25	100	3
Purpose	This course covers the concepts of computer networking and communication.					
CO 1	Introduction to fundamental of networking model.					
CO 2	To study different protocols used for transmitting data.					
CO 3	To explore physical and data link layer of networking model.					
CO 4	To study Network and transport layer of networking model.					

Unit – 1

Introduction: Basics of Computer Networks, need and Evolution of computer networks, description of LAN, MAN, WAN & wireless networks.

Basics terminology of Computer Networks: Bandwidth, physical and logical topologies, media 10 base A, 10base 5, 10 base 5, 10base-T, 100 base FX, 100base LX and wireless.

LAN & WAN devices – Router, Bridge Ethernet switch HUB, Modem SCU/DSU.

OSI Reference Model:

Laying architecture of networks, OSI model, Functions of each layer, Services and Protocols of each Layer.

Unit – 2

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, SNMP, TELNET, overview of IP version 6.

OSI and TCP/IP model with description of data encapsulation & peer to peer communication, comparison of OSI and wireless.

Unit – 3

Physical Layer: Representation of a bit on physical modem that is in wired network, optical network and wireless network. Encoding/Modulation – TTL, Manchester Encoding, AM, FM and PM. Dispersion, Jitter, Latency and Collision. Different types of media-twisted pair, unshielded twisted pair, coaxial cable, optical Fiber cable and wireless.

Data Link Layer: LLC and MAC sub layer, MAC addressing layer 2 devices, framing error control and flow control. Error detection & correction CRC, block codes parity and checksum, elementary data link protocol, sliding window protocol, channel allocation problem-static and dynamic, Multiple Access protocol- ALOHA, CSMA/CU, Token bus, token ring, FDDI.

Unit – 4

Network Layer: Segmentations and autonomous system path determination, network layer addressing, network layer data gram, IP addressed Classes. Sub netting – Sun network, Subnet Mask, Routing algorithm-optionally principle, Shortest path routing, hierarchical routing, Broadcast routing, Multicast routing, routing for mobile host – tunneling, fragmentation and DHCP, Routing protocol- RIP, IGRP, USPF and EIGRP.

Transport Layer: TCP & UDP. Three way handshaking . ATM AAL layer protocol.

Text Book:

1. Tanenbaum. “*Computer Networks*”, PHI

Reference Books:

1. Darlx, “*Computer Network and their protocols*”, DLA Labs.
2. Freer, “*Comp. Communication and Networks*”, East – West-Press.
3. Halsall Fred, *Data Communications, Computer Networks & open systems* Addison Wesley
4. Fitzgerald Jerry, *Business data communications*,
5. Larry L. Peterson & Bruce S. Davie *Computer Networks – A system approach*, , 2nd Ed TMH.

NOTE: Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 308 N	Introduction to Microcontroller					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	--	--	75	25	100	3
Purpose	To learn programming of 8051 microcontroller and its interfacing					
CO 1	To study the Architecture of 8051 microcontroller					
CO 2	Familiarization with the instruction / commands of microcontroller					
CO 3	To study timing delays					
CO 4	To learn how various devices can be interfaced with microcontroller					

UNIT-1

Introduction: - Evaluation of Microcontrollers; Classification of Microcontroller; Comparison between Microprocessor and Microcontrollers; Overview of 8051 microcontroller family. Block Diagram, Architecture and pin description of 8051. ; Types of Registers and flags of 8051.

UNIT-2

Introduction to programming of Microcontroller: - 8051 Instruction Format, Addressing modes, Data transfer instructions; Logical operations, Arithmetic operations, looping, jump and call instructions, Programming in C.

UNIT-3

Timer Programming and interrupts :- 8051 timer Programming ; 8051 Serial port programming; 8051 interrupt programming; External memory interfacing.

UNIT-4

Interfacing of microcontroller :- LCD , Keyboard interfacing ; A/D , D/A and sensor interfacing; Microcontroller interfacing with a) Relays b) opto-isolators , c) stepper motor d) DC motor

Text Books

1. Muhammad Ali Mazidi., “*The 8051 Microcontroller And Embedded Systems Using Assembly And C*” , Pearson , 2nd edition
2. Kenneth J. Ayala , “*The 8051 Microcontroller*” .

Reference Books

1. Mackenzie , “*The 8051 Microcontroller*” , Pearson Education.
2. Ghoshal Subrata , “*8051 Microcontroller: Internals, Programming & Interfacing*”, Pearson Education..

Note: The course is introductory in nature. Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-310 N	Data Warehouse & Data Mining					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	This course provides a way to understand the organization and collection of data.					
CO 1	To study basic concept of data warehouse.					
CO 2	To study the techniques of data warehouse.					
CO 3	To understand the basic concept of data mining.					
CO 4	To study data mining rules.					

UNIT-1

Introduction of Data Warehousing: The evolution of Data Warehousing (The Historical Context). The data warehousing –a brief history, today’s development environment. Principles of Data Warehousing (Architecture and Design Techniques): Types of data and their uses, conceptual data architecture, design techniques, introduction to the logical architecture. Creating the Data Asset: Business Data Warehouse Design.

UNIT-2

Unlocking the Data Asset for end users (The use of Business Information) : Designing business information warehouse, populating business information warehouse, user access to information, information data in context. Implementing the Warehouse (Managing the project and environment) : Obstacles to implementation, planning your implementation, justifying the warehouse, organizational implications of data Warehousing, the data warehouse in your organization, data warehouse management, looking to the future.

UNIT-3

Introduction of Data Mining: Motivation, importance, data mining, kind of data, functionalities, interesting patterns, classification of data mining system, major issues. Data warehouse and OLAP technology for data mining : data warehouse, operational database systems and data warehouse architecture, implementation, development of data cube technology, data warehousing to data mining, data warehouse usage.

UNIT-4

Data Preparation: Preprocess data cleaning, data integration and transformation, data reduction, discrimination and concept hierarchy generation. Data Mining Primitives, languages and system architectures, graphical user interfaces. Concept Description: Characterization and comparison data generalization and summarization based characterization, analytical characterization, and analysis of attribute relevance, mining class comparison, and mining descriptive statistical measures in large databases. Mining association rules in large databases, mining single dimensional Boolean association rules from transactional databases, mining multi-dimensional association rules from relational databases and data warehouses, from association to correlation analysis, constraint based association.

Text Books

1. J. Han & M. Kamber, *Data Mining: Concepts and Techniques*, Morgan Kaufmann/Elsevier, India, 2001
2. D. Hand, H. Mannila, & P. Smyth. *Principles of Data Mining*, MIT Press, 2001.

Reference books

1. M. Jarke et al. *Fundamentals of Data Warehouses (2nd ed.)*, Springer, 2003, ISBN 3-540-42089-4.
2. C. Seidman, *Data Mining with Microsoft SQL Server 2000* Technical Reference Microsoft Press, ISBN 0-7356-1271-4

NOTE: Eight questions each of 15 marks are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-312 N	Software Engineering Lab					
Lecture	Tutorial	Practical	Minor Test	Practical Exam	Total	Time
--	--	2	40	60	100	3
Purpose	To familiarize the students with the concept of designing the software applications.					
CO 1	To study different software life cycle model.					
CO 2	To study Requirement and designing phase of software development.					
CO 3	To study testing and maintenance phase of software development.					
CO 4	To study quality assurance and reliability of software.					

LIST OF EXPERIMENTS

1. Study and categorize the generic phases of software development and maintenance.
2. Study various software development models.
3. Study various types of feasibility study and steps in doing feasibility study.
4. Study various steps for doing the requirement analysis of any project.
5. Write algorithm and draw flow chart to implement the constructive cost estimation model (COCOMO).
6. Making use of Graphical Design notation, study the concept in developing data flow diagram (DFD) for any selected project.
7. Making use of object oriented design, implement a student & employee record system using the concept of inheritance.
8. Select an appropriate programming language & translate the detailed design made in experiment 7 in appropriate programming language.
9. Develop a complete test strategy for the project selected in exp-8. Document it in a test specification.
10. Apply the debugging process to the project selected in exp-9 in accordance with the result generated from its testing in exp-9.
11. Study various concepts involved in cost / benefit analysis.
12. Draw flow chart and write algorithm for designing an editor.

Note: A student has to perform 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-314 N	Networking Lab					
Lecture	Tutorial	Practical	Minor Test	Practical Exam	Total	Time
--	--	2	40	60	100	3
Purpose	This course covers the concepts of computer networking and communication.					
CO 1	To learn the basic concept and networking model.					
CO 2	To study different protocols used for transmitting data.					
CO 3	To study physical and data link layer of networking model.					
CO 4	To study Network and transport layer of networking model.					

LIST OF EXPERIMENTS

1. Study the physical media of connectivity.
2. Study the pin-structure of cross-over cable.
3. Study the different LAN Technologies.
4. Study the functioning of a Switch.
5. Study the Functioning of a Router.
6. Establishing LAN (Star topology) for your LAB using Hubs (18 ports, 16 ports).
7. Study and install the media converting using optical fiber.
8. Install and configure the LAN card.
9. Install and configure window 200 Server.
10. Study and implement the virtual network.

Note: A student has to perform 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-316 N	Visual Basic.net Lab					
Lecture	Tutorial	Practical	Minor Test	Practical Exam	Total	Time
--	--	3	40	60	100	3
Purpose	This course covers the concepts of .net programming.					
CO 1	To learn the basic concept of GUI					
CO 2	To study SMTP					
CO 3	To study encryption and decryption					
CO 4	To study how to create drawing application in VB.Net					

LIST OF EXPERIMENTS

1. Create a calculator that can be used for adding, subtracting, multiplication and division.
2. Write an application to use WMI to retrieve information about your PC.
3. Write an application to create a File and Folder browser.
4. Write a program in VB.NET to send an email via SMTP.
5. Write a program to create a MDI web browser.
6. Write an application to access registry in VB.NET.
7. Write a program to retrieve a web page source from the Internet.
8. Create a slot machine game using standard controls and random number generator.
9. Write a program to create a word processor.
10. Write a program for encryption and decryption.
11. Write an application to capture screen.
12. Create a drawing application in VB.NET.
13. Write an application in VB.NET to play MP#3 files.

Note: A student has to perform 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-318 N	Microcontroller Lab					
Lecture	Tutorial	Practical	Minor Test	Practical Exam	Total	Time
--	--	2	40	60	100	3
Purpose	To train the student on how to use Microcontroller.					
CO 1	To introduce the student to Microcontroller programming					
CO 2	To control LCD module.					
CO 3	Use of microcontroller in controlling stepper motor					
CO 4	Practical approach in interfacing of microcontrollers with different devices.					

LIST OF EXPERIMENTS

1. Introduction to microcontroller trainer and interfacing modules.
2. To display the digital output of ADC on 16*2 LCD Module.
3. To display character 'A' on 8*8 LED Matrix.
4. To display the data and time on LCD Module
5. To interface the seven segment display with microcontroller 8051.
6. To create a series of moving lights using 8051 on LEDs.
7. To interface the stepper motor with microcontroller.
8. To switch on and off relay by using keys.
9. To interface the DC motor using H-Bridge.
10. To interface a keypad with microcontroller.

Note: A student has to perform 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-320 N	Colloquium & Professional Proficiency					
Lecture	Tutorial	Practical	Minor Test	Practical Exam	Total	Time
-	--	2	100	-	100	
Purpose	To enhance holistic view of students so as to improve their employability skills.					
CO 1	To develop inter personal skills and be an effective goal oriented team player.					
CO 2	To develop communication and problem solving skills.					
CO 3	To develop aptitude					
CO 4	To enhance general knowledge of students in various domains of life.					

A practical and activity oriented course with continuous assessment for 100 marks.

The course will comprise of:

- a) Class room interaction and activities: Technical Quiz, aptitude tests, extempore speech, general knowledge test etc.
- b) Seminars
- c) Presentation

The student will submit a course report comprising of credits / results based on the above.

Bachelor of Technology (Information Technology)

SCHEME OF STUDIES/EXAMINATIONS

7th and 8th Semester (w.e.f. the session 2018-19)

KURUKSHETRA UNIVERSITY, KURUKSHETRA

Bachelor of Technology (Information Technology) SCHEME OF STUDIES / EXAMINATIONS

Semester – VII (w.e.f Session 2018-19)

S. No.	Course No.	Course Title	Teaching Schedule				Allotment of Marks				Duration of Exam (Hrs.)
			L	T	P	Hours/Week	Theory	Sessional	Practical	Total	
1.	IT-401N	Compiler Design	4	1	--	5	75	25	--	100	3
2.	IT-403N	Artificial Intelligence	4	1	--	5	75	25	--	100	3
3.	IT-405 N	Fundamentals of Entrepreneurship	4	1	--	5	75	25	--	100	3
4.	DEC-1	Elective-1**	4	1	--	5	75	25	--	100	3
5.	DEC-2	Elective-2**	4	1	--	5	75	25	--	100	3
6.	IT-407N	Server Side Programming Lab	--	--	3	3	---	40	60	100	3
7.	IT-409 N	Mobile Application Development Lab	--	--	3	3	---	40	60	100	3
8.	IT-411 N	Project I #	---	--	3	3	--	40	60	100	3
9.	IT-413 N	Industrial Training (Viva-Voce)**	--	--	--	--		50		50	
Total			20	5	09	34	375	295	180	850	

Note: Industrial Training which was undergone by the students after VI sem is to be evaluated during VII sem as (IT-413N) through submission of certified computerized report to the Head of the Department followed by viva-voce, seminar / presentation / demo etc.

#The project should be initiated by the students in the beginning of VII^h semester and will be evaluated at the end of the semester on the basis of a presentation , viva , demo , report etc.

** Student should select two Departmental Elective Course (DEC) from the following list:-

Departmental Elective Courses			
Course No.	DEC-1	Course No.	DEC-2
IT-415 N	Advanced Computer Network	IT-421 N	Software Testing
IT-417 N	Introduction to computer animation	IT-423 N	Software Project management
IT-419 N	Simulation and Modeling	IT-425 N	Distributed Operating System

KURUKSHETRA UNIVERSITY, KURUKSHETRA

Bachelor of Technology (Information Technology) SCHEME OF STUDIES / EXAMINATIONS

Semester – VIII (w.e.f Session 2018-19)

S. No.	Course No.	Course Title	Teaching Schedule				Allotment of Marks				Duration of Exam (Hrs.)
			L	T	P	Hours/Week	Theory	Sessional	Practical	Total	
1.	IT-402N	Mobile Communication	4	1	-	5	75	25	--	100	3
2.	IT-404N	Advanced Database System	4	1	-	5	75	25	--	100	3
3.	IT-406N	Information Security	4	1	--	5	75	25	--	100	3
4.	DEC-3	Elective-3*	4	1	--	5	75	25	--	100	3
5.	DEC-4	Elective-4*	4	1	--	5	75	25	--	100	3
6.	IT-408 N	Mobile Communication Lab	---	--	3	3	---	40	60	100	3
7.	IT-410N	Python Programming Lab	---	--	3	3	---	40	60	100	3
8.	IT-412 N	Project II	--	--	3	3	---	40	60	100	3
9.	IT-414 N	Comprehensive Viva ^{##}	--	--	--	--	---	25	--	25	--
10.	IT-416 N	General Fitness & Professional Aptitude ^{**}	--	--	--	--	---	--	25	25	--
Total			20	5	09	34	375	270	205	850	

^{##} IT-414 N (Comprehensive Viva) Marks will be based on student's Technical knowledge , professional aptitude, GK , current affairs, logical / analytic reasoning etc. Each student will be evaluated by a team comprising of at least 03 senior faculty members of the department.

^{**} IT-416 N (General Fitness & Professional Aptitude) : To be examined by an external and internal examiner at the rank of the Director / Principal / Senior faculty member of department. Marks on the basis of student's Technical knowledge , professional aptitude, GK , current affairs, logical / analytic reasoning etc.

* The student should select two Departmental Elective Courses (DEC) from the following list:-

Departmental Elective Courses			
Course No.	DEC-3	Course No.	DEC-4
IT- 418 N	Cloud Computing	IT- 424 N	Expert system
IT- 420 N	Introduction to Internet of Things	IT- 426 N	Big Data and Analytic
IT- 422N	Image Processing	IT- 428 N	Object Oriented Software Engineering

Semester VII

IT-401 N	Compiler Design					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To familiarize the students to design and implement a compiler.					
Course						
CO 1	To understand, design and implement a lexical analyzer.					
CO 2	To understand, design and implement a parser.					
CO 3	To understand, design code generation schemes.					
CO 4	To understand optimization of codes and runtime environment					

UNIT I

Introduction to Compiling

Analysis of the source program, Phases of a compiler, Grouping of Phases, Compiler construction tools.

Lexical Analysis –Regular Expression, Introduction to Finite Automata and Regular Expression, Conversion of Regular Expression to NFA, Role of Lexical Analyzer, Input Buffering, Specification of Tokens.

UNIT II

Syntax Analysis

Role of the Parser, Writing Grammars, Symbol Table, Context-Free Grammars, Shift-reduce Parser, Operator Precedence Parsing, Top Down Parsing, Predictive Parsers, LR Parsers: SLR Parser, Canonical LR Parser, LALR Parser, Implementation of LR Parsing Tables.

UNIT III

Intermediate Code Generation and Code

Intermediate languages, Declarations, Assignment Statements, Boolean Expressions, Case Statements, DAG representation of Basic Blocks, A simple Code generator from DAG, Issues in the design of code generator, The target machine, Runtime Storage management, Error Handling- Type checking,

UNIT IV

Code Optimization and Run Time Environments

Principal Sources of Optimization, Optimization of Basic Blocks, Peephole Optimization, Introduction to Global Data Flow Analysis, Source Language issues, Storage Organization, Static Storage Management, Heap Storage management, Access to non-Local Names, Parameter Passing.

Text books

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education Asia, 2003.
2. Kenneth C. Loudon, “Compiler Construction: Principles and Practice”, Thompson Learning, 2003

Reference books

1. Allen I. Holub “Compiler Design in C”, Prentice Hall of India, 2003.
2. C. N. Fischer and R. J. LeBlanc, “Crafting a compiler with C”, Benjamin Cummings, 2003.
3. J.P. Bennet, “Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill, 2003.
4. HenkAlblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-403 N	Artificial Intelligence					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	The purpose of this course is to introduce students the basic research areas in artificial intelligence					
Course Outcomes						
CO 1	To study various AI problems and techniques.					
CO 2	To study knowledge representation methods.					
CO 3	To study certainty and uncertainty based reasonings.					
CO 4	To study the basic concepts of fuzzy, neural nets & natural language processing.					

Unit-1

Introduction –foundation and history of AI:, Classical, Romantic and Modern period, Applications of AI.
 Production System: - Production rules, the working memory, Recognize-act cycle, conflict resolution strategies, refactoriness, Regency, specificity, alternative approach for conflict resolution, Architecture of production system, Types of Production systems, conclusion

Unit –2

Propositional Logic: - Proposition, tautologies, Theorem proving in propositional logic, Semantic method of Theorem proving, forward chaining, backward chaining, standard theorems in propositional logic, method of substitution, theorem proving using Wang’s algorithm, conclusion.
 Predicate Logic: - Alphabet of First order logic (FOL), predicate, well formed formula, clause form, algorithm for writing sentence into clause form, inflict of predicates, unification algorithm, resolution Robinson’s inference rule, conclusion

Unit – 3

Logic Programming and Prolog: - Logic program, Horn clause, program for scene interpretation, unification of goals, definite perform clause, SLD resolution, SLD tree, controlling back tracking, common use of cut, implementation of backtracking using stack, risk of using cuts, fail predicate, application of cut-fail combination, replace cut-fail by not, conclusion.

Default & Non monotonic reasoning: - Axiomatic theory, non-atomic reasoning using NML-I, problems with NML-I, reasoning with NML-II, truth maintenance system with example, conclusion

Unit – 4

Imprecision & Uncertainty: - Definition, Probabilistic technicians, Fuzzy reasoning, certainty factor based reasoning conditional probability, Baye’s Theorem and its limitations, Bayesian belief network, propagation of belief, Dampster-Shafer theory of uncertainty management, Types of Learning, Introduction to Genetic algorithm
 Intelligent Search Technique: - Heuristic function, AND-OR graph, Heuristic search, A* algorithm and examples.

Text Books

1. Elain Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw-Hill, New Delhi.
2. Staurt Russel and other Peter Norvig, “Artificial Intelligence – a Modern Approach”, Prentice Hall.

Reference Books.:

1. Patrick Henry Winston, “Artificial Intelligence”, Addison Wesley, third Ed.
2. Artificial Intelligence & Expert System By Patterson – PHI.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 405 N	Fundamentals of Entrepreneurship					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	The purpose of this course is to introduce students the basics of Entrepreneurship					
	Course Outcome					
CO 1	Students will be able understand who the entrepreneurs are and what competences needed to become an Entrepreneur.					
CO 2	Students will be able understand insights into the management, opportunity search, identification of a Product; market feasibility studies; project finalization etc. required for small business enterprises.					
CO 3	Students can be able to write a report and do oral presentation on the topics such as product identification, business idea, export marketing etc.					
CO 4	Students be able to know the different financial and other assistance available for the establishing small industrial units.					

Unit -I

Entrepreneurship: Concept and Definitions; Entrepreneurship and Economic Development; Classification and Types of Entrepreneurs; Entrepreneurial Competencies; Factor Affecting Entrepreneurial Growth – Economic, Non-Economic Factors; EDP Programmes; Entrepreneurial Training; Traits/Qualities of an Entrepreneurs; Entrepreneur; Manager Vs. Entrepreneur.

Unit -II

Opportunity / Identification and Product Selection: Entrepreneurial Opportunity Search and Identification; Criteria to Select a Product; Conducting Feasibility Studies; Project Finalization; Sources of Information.

Unit -III

Small Enterprises and Enterprise Launching Formalities : Definition of Small Scale; Rationale; Objective; Scope; Role of SSI in Economic Development of India; SSI; Registration; NOC from Pollution Board; Machinery and Equipment Selection; Project Report Preparation; Specimen of Project Report; Project Planning and Scheduling using Networking Techniques of PERT / CPM; Methods of Project Appraisal.

Unit -IV

Role of Support Institutions and Management of Small Business : Director of Industries; DIC; SIDO; SIDBI; Small Industries Development Corporation (SIDC); SISI; NSIC; NISBUD; State Financial Corporation SIC; Marketing Management; Production Management; Finance Management; Human Resource Management; Export Marketing; Case Studies-At least one in whole course.

Text Books:

1. Small-Scale Industries and Entrepreneurship. Himalaya Publishing House, Delhi -Desai, Vasant, 2003.
2. Entrepreneurship Management -Cynthia, Kaulgud, Aruna, Vikas Publishing House, Delhi, 2003.

Reference Books:

1. Entrepreneurship Ideas in Action- L. Greene, Thomson Asia Pvt. Ltd., Singapore, 2004.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-415 N						
Advanced Computer Networks						
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To familiarize different protocols & applications of computer networks.					
Course						
CO 1	To study MAC protocols for High speed networks.					
CO 2	To study IPv6 addressing schemes.					
CO 3	To study wireless application protocol for communication.					
CO 4	To study the concepts to manage networks.					

UNIT – 1

Introduction: Overview of computer networks, seven-layer architecture, TCP/IP suite of protocols, etc. MAC protocols for high-speed LANS, MANs, and wireless LANs. (For example, FDDI, DQDB, HIPPI, Gigabit Ethernet, Wireless Ethernet, etc.)

UNIT-2

Fast access technologies (For example, ADSL, Cable Modem, etc.).

Overview of IPv6, IPv6 & TCP/IP stack, IPv6 protocol architecture, IPv6 address basics, address notation, unicast address, multicast address, IPv6 headers, Routing table problem, static & automatic address configuration, neighbor discovery, stateless address auto configuration, Interoperation concepts of IPv4/IPv6.

UNIT-3

Mobility in networks, Mobile IP. Security related issues in mobile IP. IP Multicasting. Multicast protocols, address assignments, session discovery, etc.

Network security at various layers. Secure-HTTP, SSL, ESP, Authentication header, Key, distribution protocols. Digital signatures, digital certificates.

UNIT-4

The Wireless Applications Protocols, applications environment, wireless application protocol client software, wireless application protocol gateways, implementing enterprise wireless application protocol strategy and Security Issues in Wireless LAN. Wireless network management, GPRS, and VOIP services.

Network Management: Introduction, LAN, SNMP, and CMIP. Issues in the management of large networks. Multicast: IGMP, PIM, DVMRP

Text Books:

1. W.R. Stevens. TCP/IP Illustrated, Volume 1: The protocols, Addison Wesley, 1994.
2. G.R. Wright. TCP/IP Illustrated, Volume 2: The Implementation, Addison Wesley, 1995.

References Books:

1. W.R. Stevens. TCP/IP Illustrated, Volume 3: TCP for Transactions, HTTP, NNTP, and the Unix Domain Protocols, Addison Wesley, 1996.
2. R. Handel, M.N. Huber, and S. Schroeder. ATM Networks. Concepts, protocols, Applications, Addison Wesley, 1998.
3. William Stalling, Wireless Communications and Networks. Prentice Hall 2002

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

Introduction to Computer Animation						
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	To introduce the student to the concepts of Animation					
	Course outcomes					
CO 1	To study various Production Pipeline Components of animation					
CO 2	To introduce the students to Pre-visualization Techniques , Modeling , Texturing					
CO 3	To study Rigging and Rendering					
CO 4	To learn about the various animation techniques.					

Unit 1

Introduction: Defining 3D animation , Exploring 3D animation industry , history of animation, Understanding Production Pipeline Components : Animation preproduction , Animation production , Animation Postproduction

Unit 2

Exploring Animation, Story, and Pre-visualization : Using Principles of Fine Art and Traditional Animation : Modeling , Texturing / lighting, Character animation ; Building a good story : Story Arc, Character goal & conflict , , Storytelling Principles , ; Pre-visualization Techniques : Basic Shot Framing , camera movements , editing ; Modeling : Polygons , NURBS , Subdivision surfaces , modeling workflows
Texturing : UVs , shaders , Texture maps , Texturing workflows

Unit 3

Rigging : Parenting , Pivot Position , Skelton system , Forward & Inverse kinematics , Deformers, Constraints , Scripting , expressions , Basic Rigging workflow
Animation : Keyframe , Graph editor, timeline, Dope sheet , Workspace , animation workflow
Visual effects : Particles , Hair & Fur , Fluids , Rigid bodies , Soft bodies ; Lighting : Types , Light attributes , lighting techniques ; Rendering : Basic method , global illumination ; Creating Stereoscopic 3D ; Providing Real-Time Capabilities

Unit 4

Animation techniques : Interpolation and Basic Techniques: controlling the motion along a curve, Path following, key frames , Animation languages, deforming objects , Morphing, 3Dshape interpolation ; Natural Phenomena: Plants , water, Gaseous Phenomena , Modeling and Animating Articulated Figures

Text book :

1. Andy Beane , “3D Animation essentials” , John Wiley & sons , 2012.
2. Rick Parent, “Computer Animation: Algorithms and Techniques” , Morgan Kaufmann Publishers, 2012,
3. Nicholas Bernhardt Zeman , “Essential Skills for 3D Modeling, Rendering and Animation”, CRC press , 2015

Reference Book

1. Donald Hearn & M. Pauline Baker ,WarrenCarithers, “Computer Graphics With OpenGL”, 4thEdition, Pearson Education, 2010, ISBN: 0-13-015390-7
2. John F. Hughes, Andries van Dam , “Computer Graphics: Principles and Practice” Addison-Wesley Professional, 3rdEdition, 2013, ISBN: 978-0-321-39952-6

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-419 N	Simulation and Modeling					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To introduce the principles and paradigms of Computer Modeling and Simulation for solving a wide variety of problems.					
Course Outcomes						
CO 1	Learn the basic concept of System, system modeling, types of model, simulation and					
CO 2	Learn the simulation of contiguous and discrete system with the help of different					
CO 3	Learn the concept of generation of uniformly and non-uniformly distribution random					
CO 4	Learn the simulation of queuing system.					

UNIT-1

Modeling: System Concepts, system boundaries and environment, continuous and discrete systems, system modeling, Types of Models, Model validation, Principles & Nature of Computer modeling.

Simulation: Introduction, Basic nature of simulation, when to simulate, Advantages, disadvantages and limitations of simulation, Concepts of simulation of continuous and discrete system with the help of example.

UNIT-2

Continuous System Simulation: Analog vs. digital simulation, continuous simulation vs. numerical integration, simulation of a chemical reactor, simulation of a water reservoir system.

Discrete system simulation: Fixed time-step vs. event-to-event model, Monte-Carlo computation vs. stochastic simulation, generation of random numbers, and generation of non-uniformly distributed random numbers

UNIT-3

Simulators for the Live systems: Simulation of queuing Systems: basic concepts of queuing theory, simulation of single server, two server and more general queuing system.

Simulation of PERT network: Network model of a project, analysis of an activity network, critical path computation, uncertainties in activity durations, simulation of an activity network.

UNIT-4

Simulation of inventory control systems: Elements of inventory theory, inventory models, generation of Poisson and Erlang variates, simulator for complex inventory systems. Simulation of hypothetical computers.

Design and Evaluation of Simulation Experiments: Variance reduction techniques. Experiment layout and Validation

Simulation Languages: Continuous and Discrete Simulation Languages.

Text Books:

1. Gordon G.: System simulation, Prentice-Hall of India Pvt. Ltd. New Delhi 1993
2. Narsingh Deo: System Simulation with Digital Computer, PHI New Delhi, 1993

Reference Books:

1. Neelankavil Frances: Computer Simulation and Modelling, John Wiley & Sons, New York, 1987.
2. Payne, James A.: Introduction to simulation: Programming Techniques and Methods of Analysis, McGraw-Hill international Editions, Computer Science services, New York (1998).
3. Reitam Julian: Computer Simulation Experiments, Wiley Interscience 1971.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-421 N	Software Testing					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To provide an understanding of concepts and techniques for testing software and assuring its quality.					
Course Outcomes						
CO 1	Expose the criteria and parameters for the generation of test cases.					
CO 2	Learn the design of test cases and generating test cases.					
CO 3	Be familiar with test management and software testing activities.					
CO 4	Be exposed to the significance of software testing in web and Object orient techniques.					

UNIT-1

Introduction: Overview of software evolution, SDLC, Testing Process, Terminologies in Testing: Error, Fault, Failure, Verification, Validation, Difference between Verification and Validation, What is software testing and why it is so hard? Test Cases, Test Oracles, Testing Process, Limitations of Testing.

UNIT-2

Functional Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique. Structural Testing: Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing.

UNIT-3

Reducing the number of test cases: Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing, and Slice based testing, Testing Activities: Unit Testing, Levels of Testing, Integration Testing, System Testing, Debugging, Domain Testing.

UNIT-4

Object oriented Testing: Definition, Issues, Class Testing, Object Oriented Integration and System Testing. Testing Web Applications : What is Web testing?, User interface Testing, Usability Testing, Security Testing, Performance Testing, Database testing, Post Deployment Testing.

TEXT BOOKS:

1. Naresh Chauhan “Software Testing Principles and Practices” Oxford Publications, 2012.
2. Louise Tamres, “Software Testing”, Pearson Education Asia, 2002.
3. Robert V. Binder, “Testing Object-Oriented Systems-Models, Patterns and Tools”, Addison Wesley, 1999.
4. William Perry, “Effective Methods for Software Testing”, John Wiley & Sons, New York, 1995.

REFERENCE BOOKS:

1. Cem Kaner, Jack Falk, Nguyen Quoc, “Testing Computer Software”, Second Edition, Van Nostrand Reinhold, New York, 1993.
2. K.K. Aggarwal & Yogesh Singh, “Software Engineering”, 2nd Ed., New Age International Publishers, New Delhi, 2005.
3. Boris Beizer, “Software Testing Techniques”, Second Volume, Second Edition, Van Nostrand Reinhold, New York, 1990.
4. Boris Beizer, “Black-Box Testing –Techniques for Functional Testing of Software and Systems”, John Wiley & Sons Inc.,New York, 1995.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 423 N	Software Project Management					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	The purpose of this course is to introduce students the basics of Entrepreneurship					
CO 1	To study software economics evolution.					
CO 2	To study software management process & its framework.					
CO 3	To study software management planning, responsibilities.					
CO 4	To familiarize students about Project Management And Control					

Unit-1

Conventional Software Management : Evolution of software economics, Improving software economics: reducing product size, software processes, team effectiveness, automation through, Software environments, Principles of modern software management.

Unit-2

Software Management Process : Framework,: Life cycle phases- inception, elaboration, construction and training phase. Artifacts of the process- the artifact sets, management artifacts, engineering artifacts, and pragmatics artifacts, Model based software architectures, Workflows of the process, Checkpoints of the process.

Unit-3

Software Management Disciplines : Iterative process planning, Project organizations and responsibilities, Process automation, Project control and process instrumentation core metrics, management indicators, life cycle expectations, Process discriminates.

Unit-4

Project Management And Control : framework for Management and control – Collection of data Project termination – Visualizing progress – Cost monitoring – Earned Value Analysis- Project tracking – Change control- Software Configuration Management – Managing contracts – Contract Management.

TEXT BOOKS:

1. Bob Hughes, Mike Cotterell and Rajib Mall: Software Project Management – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.
2. . Software Project Management, Walker Royce, Addison Wesley, 1998

REFERENCE BOOKS :

- 1 Project management 2/e, Maylor.
2. Managing the Software Process, Humphrey.
3. Managing Global Software Projects. Ramesh, TMfH, 2001

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-425 N	Distributed Operating System					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	Distributed operating system is an important field for study to drive general research in distributed systems.					
Course Outcomes						
CO 1	To study the issues of distributed operating system					
CO 2	To study mutual exclusion algorithms of DOS.					
CO 3	To study deadlock detection & handling strategies of DOS.					
CO 4	To study scheduling of distributed operating system (DOS).					

Unit-1

Architecture of distributed O.S:- Introduction, motivation, system architecture type, issues in distributed O.S., Communication primitive.

Unit-2

Distributed mutual Inclusion:- Introduction, classification preliminaries simple solution, non token based algorithm, Lamport algorithm, Ricart algorithm, Mackawa's algorithm, A generalized non token based algorithm,, token based algorithm, Broad cast algorithm, Heuristic algorithm, tree based algorithm, comparative performance analysis.

Unit-3

Distributed dead lock detection:- Introduction, dead lock handling strategies, issues in deadlock detection & resolution, Control organization, centralized, distributed & hierarchical detection algorithm.

Unit-4

Distributed file system:- Introduction, architecture mechanism for building, design issues, log structured file system.

Distributed Scheduling:-Introduction, motivation, issues in load distribution, component of load algorithm, stabilizing load distribution algorithm, performance comparison, selection of a suitable load sharing algorithm, requirement for load distribution, task migration, issues in task migration.

Text Books:

1. Mukesh Singhal & N.G. Shivaratri: Advanced concepts in operating systems, TMH 2001.
2. A S Tanenbamm: Modern operating systems, PHI.

Reference Books.:

1. A. Silberschatz, P.Galvin, G.Gagne: Applied operating system concepts, Wiley.
2. Operating System Concepts , P.S.Gill, Firewall Media

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-407 N	Server Side Programming Lab					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
-	-	3	60	40	100	3
Purpose	To gain familiarity with what server-side programming is, what it can do, and how it differs from client-side programming.					
Course Outcomes						
CO 1	To study Fundamentals of server side programming and basic programs					
CO 2	To Implement program in ASP to display day, month, date, digital clock.					
CO 3	To implement string function using ASP.					
CO 4	To implement the use of Forms and its validations using ASP.					

List of Experiments:

1. Create a Subroutine with arguments passing & call the subroutine for specific no. of time.
2. Write a program in ASP which define an object & then display the properties of object with method.
3. Write a program in ASP to display present day, month & date. Also display digital clock.
4. Write a program in ASP which will check that a specific file, folder & drive exist or not. Also return the extension of file. Then use the read & write properties on a file using text-stream object.
5. Send information to the user after he submit the form using GET & POST method & implement form validation.
6. Write a program in ASP that has a form taking the user's name as input. Store this name in a permanent cookie & whenever the page is opened again, then value of the name field should be attached with the cookie's content.
7. Use ad-rotator to change advertisements on client side request.
8. Create a session dictionary using object tag. In session-on start add keys for time, user agent, remote I.P. & add appropriate values. Create a simple page to display the values.
9. Implement session tracking using user authentication.
10. Write a program to delete all cookies of your web site that has created on the client's computer.
11. Write a program in ASP to check the capabilities of the browser using browser capability component.
12. Using data base to store & retrieves values input by a user showing them & make updating & add new records to existing database.
13. Create two ASP pages, a form creation web page (selectprice.asp) and a form processing script (liststockbyprice.asp). In selectprice.asp, the user should be shown a form in which he can enter the item & desired maximum price. When it is submitted liststockbyprice.asp will return all the stocks from database whose cost are less than the price entered by user.

Note: A student has to perform at least 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-409 N	Mobile Application Development Lab					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
-	-	3	60	40	100	3
Purpose	In this lab, a student is expected to design, implement, document and present a mobile client/server system					
Course Outcomes						
CO 1	Build a native application using GUI components and Mobile application development					
CO 2	Develop an application using basic graphical primitives and databases					
CO 3	Construct an application using multi threading and RSS feed					
CO 4	Make use of location identification using GPS in an application					

LIST OF PRACTICALS:

1. Develop an application that uses GUI components, Font and Colours
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Implement an application that implements Multi threading
6. Develop a native application that uses GPS location information.
7. Implement an application that writes data to the SD card.
8. Implement an application that creates an alert upon receiving a message.
9. Write a mobile application that creates alarm clock.
10. Develop a sign-in page with appropriate validation.
11. Develop a real life application that makes use of database.

Note: A student has to perform at least 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

Semester VIII

IT-402 N						
Mobile Communication						
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To impart knowledge of mobile and wireless communication systems and techniques.					
Course Outcomes						
CO 1	To study the concepts of mobile communication and antennas.					
CO 2	Learn the basic concepts of GSM, GPRS.					
CO 3	Study of various analog & digital modulation techniques.					
CO 4	To study satellite system architecture					

Unit-1

Introduction:

Introduction cell mobile system, tuning efficiency, mobile radio environment, frequency reuse, co channel interface reduction, and handoff mechanism cell cite and mobile antennas, non cochannel interface. Frequency spectrum utility and management channel management, type of handoff and dropped call rat, cell splitting.

Analog and digital modulation techniques, performance of various modulations, spectra efficiency, and error rate, GMSK, GFSK, DQPSK modulation technique in wireless system comparison of various modulation techniques.

Unit-2

Point to point model propagation over terrains, Losses, Power requirements, Smart Antennas, antennas at cite, gain and pattern relationship mobile antennas, tilting effect, parasitic elements usage, diversity techniques.

Unit-3

Digital technology, digital speech, digital mobile telephony, GSM, Multiples access techniques, north TDMA, American TDMA (ISI36), Japauer cellular TDMA (DDC), CDMA, ISFS North American CDMA standards, PCS, PHS, Advanced system, GPRS, UMTS, IMT, WAP.

Unit-4

Satellite system architecture, satellite orbit and constellations, LEO and MEO system, GPS Information, Iridium, MSAT, VSAT, DBS, Orbcomm satellite service, use of mobile communication networks, concepts, advanced mobile communication system using satellite.

Text Book :

1. Rappaport T.S, "Wireless communication", Prentice Hall, NJ.
2. GSM, CDMA & 3G System-steel Lee and Gluis, JW.

Reference Books.:

1. K.FEHER-Wireless Digital engineering
2. Mobile Satellite communication Engineering-Richards Addison Wesley.
3. Lee, WCY, "Mobile Communication Engineering", TMIH, New Delhi.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 404N	Advance Database System					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	The student will get knowledge of query optimization, parallel and distributed database systems.					
	Course outcomes					
CO 1	To study the fundamental theories and requirements that influence the design of modern database systems					
CO 2	To apply acquired knowledge for developing holistic solutions based on database systems/database techniques					
CO 3	To study and evaluate methods of storing, managing and interrogating complex data					
CO 4	To analyze the background processes involved in queries and transactions, and explain how this impact on database operation and design.					

Unit-1

Parallel & Distributed Databases : Architecture for parallel database, parallel query evolution, parallelizing individual operations, parallel query optimization introduction to distributed databases, distributed DBMS architectures, sorting data in a distributed database DBMS, Distributed catalog management, Distributed query processing, updating distributed data, introduction to distributed transactions, Distributed concurrency control, recovery.

Unit 2

Data Mining : Introduction, counting co-occurrences, mining for rules, tree structured rules, clustering, similarity search over sequences

Unit 3

Object database systems: User defined ADT, structured types, objects and reference types, inheritance, design for an ORDBMS, challenges in implementing an ORDBMS, OODBMS, comparison of RDBMS with OODBMS and ORDBMS

Unit 4

Advanced topics : Advanced transactions processing, integrated access to multiply data source, mobile data bases main memory databases, multimedia data bases, GIS, Temporal and sequenced databases.

TEXT BOOKS:

1. R. Ramakrishna & J. Gehrks “Database Management Systems” MGH, International Ed., 2000.

REFERENCE BOOKS:

1. Korth, Silberschatz, Sudershan: Data Base concepts, MGH, 2001.
2. C. J. Date, Database Systems, 7th Ed., Addison Wesley, Pearson Education, 2000.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 406 N	Information Security					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	The course will be useful for students who plan to do research/product development/analysis in areas related to secure computing in their career.					
	Course outcome					
CO 1	To learn basics of network security and cryptography.					
CO 2	To study network authentication mechanism, with security algorithms.					
CO 3	To explore the knowledge of key exchange protocols.					
CO 4	To realize the effect on digitized security.					

Unit-1

Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security.

Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, stenography, key range and key size, possible types of attacks.

Unit-2

Symmetric key Ciphers: Block Cipher principles, Differential and Linear Cryptanalysis, Block cipher modes of operation, Stream ciphers, RC4, Location and placement of encryption function, Key distribution.

Asymmetric key Ciphers: Principles of public key crypto systems, Algorithms (RSA, Diffie-Hellman, and ECC), Key Distribution.

Unit-3

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, HMAC, CMAC, Digital signatures, knapsack algorithm

Authentication Applications: Kerberos, X.509 Authentication Service, Public – Key Infrastructure, Biometric Authentication.

Unit-4

E-Mail Security: Pretty Good Privacy, S/MIME.

Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction

Intruders, virus and Firewalls: Intruders, Intrusion detection, password management, virus and related threats, Firewall design principles, types of firewalls.

TEXT BOOKS

1. William Stallings , “Cryptography and Network Security” :, Pearson Education,4 ‘ Edition
2. Atul Kahate , “Cryptography and Network Security”, Mc Graw Hill Edition

REFERENCE BOOKS

1. Cryptography and Network Security : Forouzan Mukhopadhyay, MC Graw Hill, 2 ” Edition
2. Mark Stamp , “Information Security, Principles and Practice” Wiley India.
3. WM.Arthur Conklin, Greg White , “Principles of Computer Security”, TMH

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-418N	Cloud Computing					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To familiar the concepts of cloud services and storage to deploy various resources and arbitrary software.					
Course Outcomes						
CO 1	Facilitate the basic usage and applicability of computing paradigm.					
CO 2	Explore various cloud service and deployment models to utilize different cloud services.					
CO 3	To get enabled for various data, scalability & cloud services in order to get efficient database for cloud storage.					
CO 4	To deal with various security threats and their controlling mechanism for accessing safe cloud services.					

Unit-1

Overview of Computing Paradigm: Recent trends in Computing, Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing, evolution of cloud computing, Business driver for adopting cloud computing.

Cloud Computing (NIST Model), History of Cloud Computing, Cloud service providers, Properties, Characteristics & Disadvantages, Pros and Cons of Cloud Computing, Benefits of Cloud Computing, Cloud computing vs. Cluster computing vs. Grid computing, Role of Open Standards.

Unit-2

Cloud Computing Architecture: Cloud computing stack, Comparison with traditional computing architecture (client/server), Services provided at various levels, How Cloud Computing Works, Role of Networks in Cloud computing, protocols used, Role of Web services, Service Models (XaaS) -Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), Deployment Models-Public cloud, Private cloud, Hybrid cloud, Community cloud.

Unit-3

Service Management in Cloud Computing: Service Level Agreements (SLAs), Billing & Accounting, comparing Scaling Hardware: Traditional vs. Cloud, Economics of scaling: Benefitting enormously, Managing Data-Looking at Data, Scalability & Cloud Services, Database & Data Stores in Cloud, Large Scale Data Processing. Case study: Eucalyptus, Microsoft Azure, Amazon EC2.

Unit-4

Cloud Security: Infrastructure Security, Network level security, Host level security, Application level security, Data security and Storage, Data privacy and security Issues, Jurisdictional issues raised by Data location, Identity & Access Management, Access Control, Trust, Reputation, Risk, Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business considerations.

Text Books

1. Barrie Sosinsky, Cloud Computing Bible, Wiley - India, 2010.
2. Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Cloud Computing: Principles and Paradigms, Wiley, 2011.

Reference Books

1. Nikos Antonopoulos, Lee Gillam, Cloud Computing: Principles, Systems and Applications, Springer, 2012.
2. Ronald L. Krutz, Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley- India, 2010.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 420 N	Introduction to Internet of Things					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	To introduce the student to the fundamentals of Internet of Things					
	Course outcomes					
CO 1	To introduce a student to IoT and M2M					
CO 2	To study design methodology of IoT					
CO 3	To study the IoT reference Architecture					
CO 4	To apprise students about the various applications of IoT.					

Unit 1

Introduction : Introduction to IOT, definition and characteristics of IOT, Physical and logical design of IOT, IOT functional blocks, IOT communication model , IOT enabling technologies, IOT advantages & disadvantages ; Difference between IoT and M2M , SDN & NFV for IOT ; Everything as a Service (XaaS)

Unit 2

IoT platform design methodology ; IoT and M2M fundamentals : Devices and gateways; Data management ; Business processes in IoT ; M2M and IoT Analytics, Knowledge Management. Architecture Reference Model : Domain model , Information model , Functional model , Communication model , Safety , Privacy , Trust , Security, Device level energy issues ;

Unit 3

IoT Reference Architecture: Introduction, Functional View, Information View, Deployment and Operational View, Real world Design constraint
IoT Standards and Protocols: IoT Related Standardization ; An introduction to : - Zigbee , Z-Wave , Thread , MQTT , CoAP, AMQP , Bluetooth Low Energy.

Unit 4

Examples and applications of IOT : Home automation , Environment , Energy, Retail , Logistics , Agriculture , Industry, Smart cities , Participatory sensing , Health and Lifestyle

Text Books

1. Arshdeep Bahga, Vijay Madisetti, “Internet of Things, A Hands -on Approach”, 1st Ed 2015, University Press
2. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, , “From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”, 1st Edition, Academic Press, 2014.
3. Ovidiu Vermesan , Peter Friess , “Internet of Things – From Research and Innovation to Market Deployment” , River publishers , 2014
4. <https://www.tutorialspoint.com> , “Internet of things tutorial”

Reference Books

1. Francis daCosta , “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”, 1st Edition, Apress Publications, 2013.
2. Oliver Hersent, David Boswarthick, “The Internet of Things: Key applications and protocol”, Wiley ; 2011
3. Michael Miller, “The Internet of Things, How Smart TVs, Smart Cars, Smart Homes, and Smart Cities are changing the World”, First edition , 2015 , Pearson Education

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 422 N	Image Processing					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	The objective of this course is to prepare students to conduct research in image processing.					
Course outcomes						
CO 1	To Understand key algorithms for point, neighborhood, and geometric operations					
CO 2	To study image transformation methods.					
CO 3	To study different techniques of image compression.					
CO 4	To study different attributes of images.					

Unit-1

Digital image fundamentals, application of digital image processing, elements of digital image processing systems, vidicon camera, Line scan CCD senso, area sensor, flash A/D converter display – elements of visual perception, structure of the human eye, Luminance, brightness, contrast, mach band effect, image fidelity criteria, color models, - RGB, CMY, HIS mathematical preliminaries of 2D systems, convolution, Fourier transform – ZS transform – toeplitz and circulant matrices, orthogonal and unitary matrices.

Unit- 2

Image transforms, Unitary transform, 2D, DFT, DCT, DST, Discrete wavelet transform, Discrete Hadamard, Walsh, Hostelling transform, SVD transform, Slant Haar transforms. Image Enhancement and Restoration: Constrast stretching, intensity level slicing, Histogram equalization, spatial averaging, directional smoothing, Median filtering, nonlinear filters, maximum, minimum, geometric mean contra harmonic mean, LP mean filters, edge detection, Roberts, Sobel, Isotropic, Kinesh, Campass gradient, Laplacian operators.

Unit- 3

Degradation model - unconstrained and constrained restoration, inverse filtering, removal of blur caused by uniform linear motion, Wiener filtering, geometric transformations for image restoration.

Unit –4

Image compression- Huffman coding, truncated Huffman coding, Br, Binary codes, arithmetic coding, bit plane coding contrast area coding, Run length encoding, transform coding JPEG and MPEG coding schemes. Image Segmentation, pixel based approach, feature threshold, choice of feature, optimum threshold, threshold selection methods, region based approach, region growing, region splitting, region merging, spilt and merge.

Text books :

1. Gonzalez, R.C. and Woods, R.E., “Digital image processing”, Addison Wesley.
2. A.K.Jain, “Fundamentals of Digital Processing”, PHI.

Reference Books

1. Umbaugh, S.E. “Computer vision and image processing”, Prentice Hall Int. NJ
2. W. Pratt, “Digital Image Processing”, Wiley Inter-science

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-424 N	Expert System					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To familiarize the student about the methodologies used to transfer the knowledge of a human expert into an intelligent program to solve real-time problems					
Course Outcomes						
CO 1	Examining the fundamentals and terminologies of expert system.					
CO 2	To introduce students to expert system tools.					
CO 3	Signifying AI techniques to solve social, industrial and environmental problems.					
CO 4	Application of professional aspects in multi-disciplinary approach to meet global Standards towards design, realizing and manufacturing.					

Unit-1

Introduction to AI programming languages, Blind search strategies, Breadth first – Depth first – Heuristic search techniques Hill Climbing – Best first – A Algorithms AO* algorithm – game trees, Min-max algorithms, game playing – Alpha beta pruning.

Knowledge representation issues predicate logic – logic programming Semantic nets- frames and inheritance, constraint propagation; Representing Knowledge using rules, Rules based deduction systems.

Unit-2

Introduction to Expert Systems, Architecture of expert system, Representation and organization of knowledge, Basics characteristics, and types of problems handled by expert systems.

Expert System Tools: Techniques of knowledge representations in expert systems, knowledge engineering, System-building aids, support facilities, stages in the development of expert systems.

Unit-3

Building an Expert System: - Expert system development, Selection of tool, Acquiring Knowledge, Building process.

Unit-4

Problems with Expert Systems: Difficulties, common pitfalls in planning, dealing with domain expert, difficulties during development.

TEXT BOOKS

1. Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw-Hill, New Delhi, 2008.
2. Waterman D.A., “A Guide to Expert Systems”, Addison Wesley Longman, 1985.

REFERENCE BOOKS

1. Stuart Russel , Peter Norvig, “Artificial Intelligence – A Modern Approach”, Prentice Hall, 1995.
2. Patrick Henry Winston, “Artificial Intelligence”, Addison Wesley, 1979.
3. Patterson, Artificial Intelligence & Expert System, Prentice Hall India, 1999.
4. Hayes-Roth, Lenat and Waterman: Building Expert Systems, Addison Wesley, 1983.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 426 N	Big Data and Analytics					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	To provide knowledge of Big Data Analytics and Distributed File Systems.					
	Course outcomes					
CO 1	To learn in details the concepts of big data.					
CO 2	Expose the criteria of big data analytics and big data storage.					
CO 3	To explore knowledge of big data compression techniques.					
CO 4	To explore learning of big data tools .					

Unit-1

Big Data Background:-Big data definition and features of big data, big data value, development of big data, challenges of big data, NoSQL databases, technologies related to big data including cloud computing, Internet of Things, data center, Hadoop, relationship between IoT and big data, relationship between hadoop and big data, big data generation and acquisition includes data collection, data transmission, data pre-processing, big data applications.

Unit-2

Big Data Analytics and Storage:-Big data analysis, big data analytic methods and tools, Pig, Hive, Flume, Mahout, Big data storage, distributed storage system for massive data, storage mechanism for big data GFS, HDFS, HBase, MongoDB, Cassandra, big data storage deduplication techniques, fixed-size and variable-size blocks based deduplication, content defined chunking, frequency based chunking, byte and multi-byte indexing techniques, Cloud storage.

Unit-3

Big Data Compression:-Big data delta compression, Xdelta implementation, Message Digest (MD5), Secure Hash Algorithm (SHA-1/SHA-256), Gear Hash, Tiger Hash, Rabin and Incremental Secure Fingerprint based deduplication, lossless duplicate and similar data elimination approaches, Parallel deduplication and compression using PCOMPRESS, Scalable Decentralized Deduplication Store (SDDS) using Cassandra.

Unit-4

Big Data Processing:- Installation procedure with system requirements for Apache Hadoop, Cassandra, Spark, Pig, Hive, HBase, MongoDB large scale distributed storage systems, Map Reduce programming model working, YARN architecture, Apache Pig and Hive architecture, Single node and Multi-nodes Hadoop Cluster Set up and running a Big Data example, NoSQL implementation.

Text Books:-

1. "Big Data" by Viktor Mayer-Schönberger, Kenneth Cukier, ISBN:978-0544002692, Eamon Dolan/Houghton Mifflin arcourt 2013.
2. "Big Data Now", by O'Reilly Media Inc., ASIN: B0097E4EBQ, O'Reilly 2012.
3. "Hadoop Operation", by Eric Sammer, ISBN: 978-1449327057, O'Reilly 2012.

Reference Books:-

1. "Programming Hive", by Edward Capriolo, ISBN: 978-1449319335, O'Reilly 2012.
2. "HBase: the Definitive Guide", by Lars George, ISBN: 978-1449396107, O'Reilly 2011.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

Object Oriented Software Engineering						
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	To impart knowledge about the use of Object Oriented Software Engineering approaches and platforms to solve real time problems.					
CO 1	To learn the basic concepts of object oriented systems and software engineering.					
CO 2	To get exposure of various object modeling methodologies					
CO 3	To explore problems using Use Cases, analyzing relations, responsibilities and collaborations among classes and their behavior in problem domain.					
CO 4	To evaluate object oriented design processes using models, design patterns, interfaces designs and communication mechanisms for performing required tasks.					

Unit-1

Introduction : An Overview of Object-Oriented system Development, Objects Basis, Class Hierarchy, Inheritance, Polymorphism, Object Relationships and Associations, Aggregations and Object Containment, Object Persistence, Meta-Classes, Object Oriented Systems Development Life Cycle: Software Development Process, Object Oriented Systems Development: A Use-Case Driven Approach.

Unit -2

Object Oriented Methodologies: Rumbaugh Methodology, Jacobson Methodology, Booch Methodology, Patterns, Frameworks, The Unified approach, Unified Modeling Language (UML)

Unit -3

Object Oriented Analysis Process, Use Case Driven Object Oriented Analysis, Use Case Model, Object Analysis: Classification, Classification Theory, Approaches for identifying classes, Responsibilities and Collaborators, Identifying Object Relationships, Attributes and Methods: Associations, Super-Sub Class relationships, A-Part-of-Relationships-Aggregation, Class Responsibilities, Object Responsibilities.

Unit -4

Object Oriented Design process and Design Axioms, Corollaries, Design Patterns, Designing Classes: Object Oriented Design Philosophy, UML Object Constraint Language, Designing Classes: The Process, Class Visibility, Refining Attributes, Designing Methods and Protocols, Packages and Managing classes, View Layer: Designing Interface objects, Designing View layer Classes, Macro and Micro Level Interface Design Process.

Text books:

1. Ali Bahrami, "Object Oriented Systems Development", McGraw Hill , 2013.
2. Rumbaugh et al., "Object Oriented Modeling and Design", PHI, 2006.
3. Robert Laganière and Timothy C. Lethbridge, "Object-Oriented Software Engineering: Practical Software Development", McGraw-Hill , Sixth Print 2008.

Reference books:

1. Ivar Jacobson, Magnus Christerson, Patrick Jonsson, Gunnar Overgaard, Object-oriented Software Engineering: A Use Case Driven Approach, Pearson Education, New Delhi, 7th Edition Reprint, 2009.
2. David C. Kung, "Object-Oriented Software Engineering: An Agile Unified Methodology", McGraw-Hill, 2013.
3. Bernd Bruegge, Allen H. Dutoit, "Object-Oriented Software Engineering: Using UML, Patterns, and Java", Pearson New International, Third Edition, 2013.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-408 N	Mobile Communication Lab					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
-	-	3	60	40	100	3
Purpose	To understand and demonstrate the communication techniques and satellite system.					
Course Outcomes						
CO 1	To study of home networking					
CO 2	To study RF environment and GSM networks.					
CO 3	To establish the link of establish link between GPS satellite and GPS trainer					
CO 4	To establish PC to PC communication using satellite communication link					

LIST OF PRACTICALS:

1. Observe the Modulation and demodulation using internal generation of 2047 bit PN sequence as modulator input and Bit error rate measurement with PRBS-11 data (2047 bits).
2. Study of home networking using combination of CDMA, BLUETOOTH, infrared Ethernet & various sensors like fire, gas air conditioning. Use at least five sensors
3. Understanding RF environment & study of GSM network by actually connecting to the GSM environment by any services provide SIM like airtel, idea, RPG etc.
4. Real time study of various GSM commands like Network registration, call control, call setting, call information, phone book commands & commands related to network information about number of cells and their strength etc.
5. To understanding the concept of GPS and establishing link between GPS Satellite & GPS Trainer.
6. To establish audio & video combined link & data communication between transmitters, receiver satellite transponder simulated in a lab.
7. To study and observe the difference in uplink & downlink frequency.
8. To establish PC-to-PC communication using satellite communication link.
9. To calculate antenna gain and antenna beam width.
10. Study and observe the Wave Modulation and Demodulation
11. To plot the radiation pattern of micro strip antennas.
12. Study and observe the antenna matching and antenna radiation with distance.

Note: A student has to perform at least 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT – 410 N	Python Programming Lab					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
--	--	3	60	40	100	3
Purpose	The course is designed to provide Basic knowledge of Python					
CO 1	To study fundamentals of python programming and implement basic programs.					
CO 2	To implement the searching technique using python.					
CO 3	To implement sorting techniques using python.					
CO 4	To implement matrix multiplication using python.					

LIST OF PRACTICALS:

1. WAP to compute the GCD of two numbers.
2. WAP to find the square root of a number
3. WAP to find the Exponentiation (power of a number)
4. WAP to find the maximum of a list of numbers
5. WAP for Linear search and Binary search
6. WAP for Selection sort, Insertion sort
7. WAP for Merge sort
8. WAP to find first n prime numbers
9. WAP to multiply matrices
10. WAP that take command line arguments (word count)
11. WAP to find the most frequent words in a text read from a file
12. WAP to Simulate elliptical orbits in Pygame
13. WAP to Simulate bouncing ball using Pygame

Note: A student has to perform at least 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.