AISECT UNIVERSITY, Bhopal, (M.P.)
Scheme of Examination

Department: Computer science & Egg.

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS - 401	Analog & Digital Communication	5(3+1+1)	50	20	30	25	25	150	3 hr	2 hr

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Course Objectives:

- To understand the building blocks of digital communication system.
- To prepare mathematical background for communication signal analysis.
- To understand and analyze the signal flow in a digital communication system.
- To analyze error performance of a digital communication system in presence of noise and other interferences.
- To understand concept of spread spectrum communication system.

Syllabus

Theory:

UNIT-I

Time domain and frequency domain representation of signal, Fourier Transform and its properties, Transform of Gate, Periodic gate, Impulse periodic impulse sine and cosine wave, Concept of energy density and power density (Parseval's theorem), Power density of periodic gate and impulse function, impulse response of a system, convolutions, convolution with impulse function, causal and non causal system impulse response of ideal low pass filter, Correlation & Auto correlation.

UNIT-II

Base band signal, need of modulation, Introduction of modulations techniques.Amplitude modulation, Equation and its frequency domain representation, Bandwidth, Power distribution. AM suppressed carrier waveform equation and frequency domain representation Generation (Balance/Chopper modulator) and synchronous detection technique, errors in synchronous detection, Introduction to SSB and VSB Transmission Angle modulation, Frequency and phase modulation equation and their relative phase and frequency deviations, modulation index frequency spectrum, NBFM and WBFM, Bandwidth comparison of modulation techniques.

UNIT-III

Sampling of signal, sampling theorem for low pass and Band pass signal, Pulse amplitude modulation (PAM), Time division, multiplexing (TDM). Channel Bandwidth for PAM-TDM signal Type of sampling instantaneous, Natural and flat top, Aperture effect, Introduction to pulse position and pulse duration modulations, Digital signal, Quantization, Quantization error, Pulse code modulation, signal to noise ratio, Companding, Data rate and Baud rate, Bit rate, multiplexed PCM signal, Differential PCM (DPCM), Delta Modulation (DM) and Adaptive Delta Modulation (ADM), comparison of various systems.

UNIT-IV

Digital modulations techniques, Generation, detection, equation and Bandwidth of amplitude shift keying (ASK) Binary Phase Shift keying (BPSK), Differential phase shift keying (DPSK), offset and non offset quadrature phase shift keying (QPSK), M-Ary PSK, Binary frequency Shift Keying (BFSK), M-Ary FSK Quadrature Amplitude modulation (QAM), MODEM, Introduction to probability of error.

UNIT-V

Information theory and coding- Information, entropies (Marginal and conditional), Model of a communication system, Mathematical representation of source, channel and receiver characteristics, Mutual information, channel capacity efficiency of noise free channel Binary symmetric channel (BSC) Binary erasure channel (BEC), Repetition of signal, NM symmetric Binary channel, Shannon theorem, Shanon-Hartley theorem (S/N-BW trade off)Source encoding code properties; Shanon, Fano and Huffman coding methods and their efficiency error control coding, Minimum Hamming distance, Linear Block Code, Cyclic code and convolution codes. Line Encoding: Manchester coding, RZ, NRZ coding.

Practical:

1. Study of sampling process and signal reconstruction and aliasing.
2. Study of PAM PPM and PDM.
3. Study of PCM transmitter and receiver.
4. Time division multiplexing (TDM) and De multiplexing.
5. Study of ASK PSK and FSK transmitter and receiver.
6. Study of AM modulation and Demodulation techniques (Transmitter and Receiver) Calculate of parameters.
7. Study of FM modulation and demodulation (Transmitter and Receiver) & Calculation of parameters.
8. To construct and verify pre emphasis and de-emphasis and plot the wave forms.
9. Study of super hetrodyne receiver and characteristics of ratio radio receiver.
10. To construct frequency multiplier circuit and to observe the waveform
11. Study ofAVC and AFC.

Course outcomes:

On successful completion of the course students will be able to:

1. Understand basic elements of a communication system
2. Conduct analysis of baseband signals in time domain and in frequency domain
3. Demonstrate understanding of various analog and digital modulation and demodulation techniques techniques.
4. Analyse the performance of modulation and demodulation techniques in various transmission environments
5. Appreciate the importance of synchronisation in communication systems

Reference Books:

1. Singh & Sapre, Communication System, TMH
2. Taub & shilling, Communication System, TMH
3. Hsu; Analog and digital communication(Schaum); TMH

4. B.P. Lathi, Modern Digital and analog communication system,
5. Simon Haykins, Communication System. John Willy
6. Wayne Tomasi, Electronic Communication system.
7. Martin S. Roden, Analog & Digital Communication System; Discovery Press.
8. Frank R. Dungan, Electronic Communication System, Thomson/Vikas.

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TBCS - 402	Computer System Organization	5(3+1+1)	50	20	30	25	25	150	3 hr	2 hr

Course Objectives

This course helps to develop the following capabilities.

- Enabling Knowledge: structure and function of digital computers, operating systems and basic assembly language programming.
- Critical analysis: Ability to analyse and model the structure and functioning of a digital computer, including overall system architecture, operating system, and digital components.
- Communication: Ability to explain the structure and functioning of a digital computer system, operating system and various digital components, in written form, to IT specialists.

Syllabus

Theory:

UNIT-I

Computer Basics and CPU:

Von Newman model, various subsystems, CPU, Memory, I/O, System Bus, CPU and Memory registers, Program Counter, Accumulator, Instruction register, Micro operations, Register Transfer Language, Instruction Fetch, decode and execution, data movement and manipulation, Instruction formats and addressing modes of basic computer. 8085 microprocessor organization

UNIT-II

Control Unit Organization:

Hardwired control unit, Micro and nano programmed control unit, Control Memory, Address Sequencing, Micro Instruction formats, Micro program sequencer, Microprogramming, Arithmetic and Logic Unit: Arithmetic Processor, Addition, subtraction, multiplication and division, Floating point and decimal arithmetic and arithmetic units, design of arithmetic unit.

UNIT-III

Input Output Organization:

Modes of data transfer - program controlled, interrupt driven and direct memory access, Interrupt structures, I/O Interface, Asynchronous data transfer, I/O processor, 8085 I/O structure, 8085 instruction set and basic programming. Data transfer- Serial / parallel, synchronous/asynchronous, simplex/half duplex and full duplex.

UNIT-IV

Memory organization:

Memory Maps, Memory Hierarchy, Cache Memory - Organization and mappings. Associative memory, Virtual memory, Memory Management Hardware.

UNIT- V

Multiprocessors:

Pipeline and Vector processing, Instruction and arithmetic pipelines, Vector and array processors, Interconnection structure and inter-processor communication.

List of Practicals

1. Study of Multiplexer and Demultiplexer
2. Study of Half Adder and Subtractor
3. Study of Full Adder and Subtractor
4. WAP to add two 8 bit numbers and store the result at memory location 2000
5. WAP to multiply two 8 bit numbers stored at memory location 2000 and 2001 and stores the result atmemory location 2000 and 2001.
6. WAP to add two 16-bit numbers. Store the result at memory address starting from 2000.
7. WAP which tests if any bit is '0' in a data byte specified at an address 2000. If it is so, 00 would be stored at address 2001 and if not so then FF should be stored at the same address.
8. Assume that 3 bytes of data are stored at consecutive memory addresses of the data memory starting at 2000. Write a program which loads register C with (2000), i.e. with data contained at memory address 2000, D with (2001), E with (2002) and A with (2001).
9. Sixteen bytes of data are specified at consecutive data-memory locations starting at 2000. Write a program which increments the value of all sixteen bytes by 01.
10. WAP to add t 10 bytes stored at memory location starting from 3000. Store the result at memory location 300A.

Course Outcomes -

1 Describe various data representations and explain how arithmetic and logical operations are performed by computers

2 Describe organization of digital computers and explain the basic principles and operations of different components

3 Evaluate the performance of CPU, memory and I/O operations Professional Skill

4 Design a basic computer system using the major components

5 Write low-level programs to perform different basic instructions

References Books:

1. Morris Mano: Computer System Architecture, PHI.
2. Tanenbaum: Structured Computer Organization, Pearson Education
3. J P Hayes, Computer Architecture and Organisations, Me- Graw Hills, New Delhi
4. Gaonkar: Microprocessor Architecture, Programming, Applications with 8085; Penram Int.
5. William Stallings: Computer Organization and Architecture, PHI
6. ISRD group; Computer orgOrganization; TMH
7. Carter; Computer Architecture (Schaum); TMH
8. Carl Hamacher: Computer Organization

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TBCS - 403	Theory Of Computation	3(2+1+0)	50	20	30	-	-	100	3 hr	-

Course objectives:

1. Introduction of the mathematical foundations of computation including automata theory; the theory of formal languages and grammars; the notions of algorithm, decidability, complexity, and computability.
2. Enhance/develop students' ability to understand and conduct mathematical proofs for computation and algorithms.

Syllabus

Theory:
RATIONALE:
The purpose of this subject is to cover the underlying concepts and techniques used in Theory of Computation. In this syllabus we cover finite automata, pushdown automata, Context free grammars and Turing machines.
PREREQUISITE:-
The students should have general idea about computing and mathematical concepts , Transition graph, Transition matrix.

UNIT-I
AUTOMATA
Basic machine, FSM , Transition graph, Transition matrix, Deterministic and nondeterministic FSM'S, Equivalence of DFA and NDFA, Mealy & Moore machines, minimization of finite automata, Two-way finite automata.

REGULAR SETS AND REGULAR GRAMMARS:
Alphabet, words, Operations, Regular sets, Finite automata and regular expression,Myhill- Nerode theorem Pumping lemma and regular sets, Application of pumping
lemma, closure properties of regular sets.

UNIT-II
CONTEXT -FREE GRAMMARS:
Introduction to CFG, Regular Grammars, Derivation trees and Ambiguity, Simplification of Context

UNIT –III

PUSHDOWN AUTOMATA:

Definition of PDA, Deterministic Pushdown Automata, PDA corresponding to given CFG, CFG corresponding to a given PDA.

CONTEXT FREE LANGUAGES:

The pumping lemma forCFL's, Closure properties of CFL's, Decision problems involving CFL's.

UNIT-IV

TURING MACHINES

Introduction, TM model, representation and languages acceptability of TM Design of TM,Universal TM & Other modification, Church's hypothesis, composite & iterated TM. Turing machine as enumerators.Properties of recursive & recursively enumerable languages,Universal Turing machine

UNIT –V

TRACTABLE AND UNTRACTABLE PROBLEMS:

P, NP, NP complete and NP hard problems, examples of these problems like satisfy ability problems, vertex cover problem, Hamiltonian path problem, traveling sales man problem, Partition problem etc.

Course Outcomes:

After completing this course, students will be able to:

1. Analyse and design finite automata, pushdown automata, Turing machines, formal languages, and grammars.
2. Demonstrate their the understanding of key notions, such as algorithm, computability, decidability, and complexity through problem solving.
3. Prove the basic results of the Theory of Computation.
4. State and explain the relevance of the Church-Turing thesis.

Reference Books:

1. John E. Hopcroft, Jeffery Ullman,"Introduction to Automata theory, Langauges & computation", Narosa Publishers.
2. K.L.P Mishra & N.Chandrasekaran.'Theory of Computer Science", PHI Learning.
3. Michael Sipsev,"Theory of Computation",Cenage Learning.
4. John C Martin, "Introdution to languages and theory of computation", McGraw Hill.
5. Daniel LA. Cohen,"lntroduction to Computer Theory",Wiley India.
6. Kohavi,"Switching & Finite Automata Theory",TMH.

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TBCS - 404	Analysis & Design of Algorithm	5(3+1+1)	50	20	30	25	25	150	3 hr	2 hr

Course Objectives

- Effective problem solving in computing.
- The use of different paradigms of problem solving will be used to illustrate clever and efficient ways to solve a given problem.
- In each case emphasis will be placed on rigorously proving correctness of the algorithm.
- The analysis of the algorithm will be used to show the efficiency of the algorithm over the naive techniques.

Syllabus

Theory:

UNIT-I

Algorithms, Designing algorithms, analyzing algorithms, asymptotic notations, heap and heap sort. Introduction to divide and conquer technique, analysis, design and comparison of various algorithms based on this technique, example binary search, merge sort, quick sort, strassen's matrix multiplication.

UNIT -II

Study of Greedy strategy, examples of greedy method like optimal merge patterns, Huffman coding, minimum spanning trees, knapsack problem, job sequencing with deadlines, single source shortest path algorithm

UNIT-III

Concept of dynamic programming, problems based on this approach such as 0/1 knapsack, multistage graph, reliability design, Floyd-Warshall algorithm

UNIT-IV

Backtracking concept and its examples like 8 queen's problem, Hamiltonian cycle, Graph coloring problem etc. Introduction to branch & bound method, examples of branch and bound method like traveling salesman problem etc. Meaning of lower bound theory and its use in solving algebraic problem, introduction to parallel algorithms.

UNIT-V

Binary search trees, height balanced trees, 2-3 trees, B-trees, basic search and traversal techniques for trees and graphs (In order, preorder, postorder, DFS, BFS), NP-completeness.

This is a first course in data structures and algorithm design.

Course outcomes:

Students will be able to :

- Learn good principles of algorithm design;
- Learn how to analyse algorithms and estimate their worst-case and average-case behaviour (in easy cases);
- Become familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles;
- Learn how to apply their theoretical knowledge in practice (via the practical component of the course).

Practical:

1. Write a program for Binary Search using recursion.
2. Write a program for Merge Sort.
3. Write a program for Quick Sort.
4. Write a program for Strassen's Matrix Multiplication.
5. Write a program for optimal merge patterns.
6. Write a program for Huffman coding.
7. Write a program for minimum spanning trees using Kruskal's algorithm.
8. Write a program for minimum spanning trees using Prim's algorithm.
9. Write a program for single sources shortest path algorithm.
10. Write a program for Flodye-Warshal algorithm.
11. Write a program Traversing of binary tree (IN-Order, Pre-Order, Post-Order)
12. Write a program Traversal of graph (BFS, DFS)

- REFERENCES BOOKS:

1. Coremen Thomas, Leiserson CE, Rivest RL; Introduction to Algorithms; PHI.
2. Horowitz & Sahani; Analysis & Design of Algorithm
3. Dasgupta; algorithms; TMH
4. Ullmann; Analysis & Design of Algorithm;
5. Michael T Goodrich, Robarto Tamassia, Algorithm Design, Wiely India

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TBCS 405	System Engineering	3(2+1+0)	50	20	30			100	3 hr	

Course Objectives:

The curriculum of the Department is designed to satisfy the diverse needs of students. Coursework is designed to provide students the opportunity to learn key concept of Applications of Fourier Series, Fourier & Laplace Transforms and Statistical Techniques.

Syllabus

Theory:
UNIT-I

What is System Engineering, Origin, Examples of Systems requiring systems engineering,Systems Engineer Career Development Model, Perspectives of Systems Engineering, Systems Domains, Systems Engineering Fields, System Engineering Approaches.

UNIT-II

Structure of Complex Systems, System Building Blocks and Interfaces, Hierarchy of Complex Systems, System Building Blocks, The System Environment, Interfaces and Interactions, Complexity in Modern Systems.

UNIT-III

Concept Development and Exploration, Originating a New System, Operations Analysis, Functional Analysis, Feasibility, System Operational Requirements, Implementation of Concept Exploration.

UNIT-IV

Engineering Development, Reducing Program Risks, Requirements Analysis, Functional Analysis and Design, Prototype Development as a Risk Mitigation Technique, Development Testing, Risk Reduction. Integration and Evaluation, Integrating,

UNIT-V

Testing, And Evaluating The Total System, Test Planning And Preparation, System Integration, Developmental System Testing, Operational Test And Evaluation, Engineering For Production, Transition From Development To Production, Production Operations.

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- **COURSE OUTCOMES**- Understand the overall concepts which are characteristic of a systems approach to engineering
- Understand the overall process elements, and their relationships, which collectively constitute the building blocks of systems engineering
- Understand and be able to relate the roles of developer as supplier, developer as creator and developer as acquirer, and to place their own roles, and those of their customers (internal and external) and suppliers (internal and external) within this framework
- Be able to perform the basics of some of the more important techniques of system requirements analysis, development of physical solution, development of logical solution, evaluation of solution alternatives (trade-off studies) and design iteration
- Be familiar with the principles and major techniques of engineering management in a systems project context
- Have some basic capability to tailor the application of the systems engineering principles and methods to different application scenarios; and
- Be capable of extensive further learning in the field of systems engineering within a sound conceptual framework.

REFERENCES:

1. Alexander Kossiakoff, William N Sweet, "System Engineering Principles and Practice, Wiley India
2. Blanchard Fabrycky, Systems engineering and analysis, Pearson
3. Dennis M. Buede, William D.Miller, "The Engineering Design of Systems: Models & Methods" Wiley India
4. JeffreyL Whitten, Lonnie D Bentley, "System Analysis and Design Methods"
5. Richard Stevens, Peter Brook," System Engineering – Coping with complexity, Prentice Hall

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TBCS 406	Material Science	3(2+1+0)	50	20	30			100	3 hr	

Course Objective –
It will help students to learn basics of materials, technology related to semiconductor and issues mechanical, electrical, magnetic and thermal properties of metals.

Course Contents
Syllabus

Theory:
UNIT-I
Introduction–Classification of materials, Advanced materials, Classification of Electrical and Electronic materials, Different types of Engineering materials, atomic structure, electron in atoms, periodic table, atomic bonding in solids, Structure of crystalline solids- introduction, units cells, crystal systems, crystallographic directions and planes.

UNIT-II

Mechanical properties of metals–Introduction, types of metal alloys, ferrous alloys, non ferrous alloys, thermal processing of metals, Deformation, Concepts of stress and strain, elastic deformation, plastIc deformation, hardness, variability of material properties, design / safety factors.

UNIT-III

Semiconductor Technology : Element form Semiconducting materials, Formulated Semiconducting materials, optical materials in LED, materials for optical Fibres, crystal growth and wafer preparation .Materials for electrical applications, Batteries, electronic applications, computer applications, networking applications. Grid work construction of plates

UNIT-IV

Electrical Properties of Materials –Ohm's Law, Electrical Conductivity, Electronic and Ionic conduction, Energyband structures in solids, conduction in terms of band and atomic bonding models, Electron mobility, electrical resistivity of metals, intrinsic semi conduction, extrinsic semi conduction, thetemperature dependence of carrier concentration, factors that affect carrier mobility, the Hall effect, semiconductor devices.

UNIT-V
Magnetic Properties – Introduction, Basic Concepts, electronic spin, Diamagnetism and Paramagnetism,Ferromagnetism, Antiferromagnetism and Ferrimagnetism, The influence of

temperature on magnetic behavior, Domains and Hysteresis, Magnetic anisotropy, soft magnetic materials, Hard Magnetic Materials, magnetic storage, superconductivity, Themal properties –Heat capacity, themal expansion and conductivity.

Course outcome –

1.Understanding of magnetic materials , properties of toxic heavy materials .
2.Learning of crystalline solids and polymer structures
3.Creating understanding of semiconductor technology and measurements
4.Learning mechanical, electrical and magnetic properties of metals.

References:

1.R Balasubramaniam “Callister’s Material Science and Engineering Second edition” ,Wiley
2.M S Tyagi “ Introduction to Semiconductor Materials and Devices” , Wiley
3.Charles M. Gilmore “Materials Science and Engineering Properties ” Cengage Learning
4.K.M. Guptaand Nishu Gupta “Advanced electrical and Electronic Materials” Wiley

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TBCS - 407	Programming System (.Net Technologies)	2(0+0+2)				25	25	50		2 hr

Syllabus

Theory:

UNIT- I

Introduction: .NET framework, features of .Net framework, architecture and component of .Net, elements of .Net.

UNIT- II

Basic Features Of C#: Fundamentals, Classes and Objects, Inheritance and Polymorphism, Operator Overloading, Structures. Advanced Features Of C# Interfaces, Arrays, Indexers and Collections; Strings and Regular Expressions, Handling Exceptions, Delegates and Events.

UNIT-III

Installing ASP.NET:framework, overview of the ASP .net framework, overview of CLR, class library, overview of ASP.net control, understanding HTML controls, study of standard controls, validations controls, rich controls. Windows Forms: All about windows form, MDI form, creating windows applications, adding controls to forms, handling Events, and using various Tolls.

UNIT-IV

Understanding and handling controls events, ADO.NET- Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader Data base controls: Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control, object data source control, site map data source.

UNIT-V

XML: Introducing XML, Structure, and syntax of XML, document type definition (DTD), XML Schema, Document object model, Presenting and Handling XML. xml data source, using navigation controls, introduction of web parts, using Java script, Web Services.

Practical:

1. Working with call backs and delegates in C#
2. Code access security with C#.
3. Creating a COM+ component with C#.
4. Creating a Windows Service with C#

5. Interacting with a Windows Service with C#
6. Using Reflection in C#
7. Sending Mail and SMTP Mail and C#
8. Perform String Manipulation with the String Builder and String Classes and C#:
9. Using the System .Net Web Client to Retrieve or Upload Data with C#
10. Reading and Writing XML Documents with the XML Text-R/-W Class and C#
11. Working with Page using ASP .Net.
12. Working with Forms using ASP .Net
13. Data Sources access through ADO.Net,
14. Working with Data readers , Transactions
15. Creating Web Application.

Reference Books:

1. C# for Programmers by Harvey Deitel, Paul Deitel, Pearson Education
2. Balagurusamy; Programming in C#; TMH
3. Web Commerce Technology Handbook by Daniel Minoli, Emma Minoli, TMH
4. Web Programming by Chris Bates, Wiley
5. XML Bible by Elliotte Rusty Harold ,
6. ASP .Net Complete Reference by McDonald, TMH.
7. ADO .Net Complete Reference by Odey, TMH

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STCS-404	C#.Net	2(0+1+1)				25	25	50		2 hr

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Syllabus

Theory:

UNIT I

Introduction .NET framework, features of .Net framework, architecture and component of .Net, elements of .Net. Introduction to Project and Solution in Studio, Entry point method - Main., Compiling and Building Projects

UNIT II

Basic Features Of C# Fundamentals, Datatypes Global, Stack and Heap Memory, Common Type System, Reference Type and Value Type,Datatypes & Variables Declaration Operators, Control Statements, Working with Arrays,

UNIT III

Working with Methods, Pass by value and by reference and out parameters,Implicit and Explicit Casting, Checked and Unchecked Blocks – Overflow Checks, Casting between other datatypes, Boxing and Unboxing, Enum and Constant,

UNIT IV

Classes and Objects, Inheritance and Polymorphism, Operator Overloading, Structures. Advanced Features Of C# Interfaces, Arrays, Indexers and Collections; Strings and Regular Expressions, Handling Exceptions, Delegates and Events.

UNIT V

Understanding and handling controls events, ADO.NET- Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader Data base controls: Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control,

Practical:

1. Working with call backs and delegates in C#
2. Code access security with C#.
3. Creating a COM+ component with C#.
4. Creating a Windows Service with C#
5. Interacting with a Windows Service with C#
6. Using Reflection in C#

7. Sending Mail and SMTP Mail and C#
8. Perform String Manipulation with the String Builder and String Classes and C#:
9. Using the System .Net Web Client to Retrieve or Upload Data with C#
10. Reading and Writing XML Documents with the XML Text-Reader/-Writer Class and C#

Reference Books:

1. Harvey Deitel, Paul Deitel, "C# for Programmers" , Pearson Education .
2. Balagurusamy, "Programming in C#", TMH.
3. Daniel Minoli, Emma Minoli, "Web Commerce Technology Handbook", TMH.
4. Chris Bates, "Web Programming", Wiley
5. Elliotte Rusty Harold, "XML Bible"
6. Odey, "ADO .Net Complete Reference", TMH

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STCS-405	Windows Server	2(0+1+1)				25	25	50		2 hr

Syllabus

Theory:

UNIT-I

Disk Management – MBR, GPT, VHD, Basic disk, Dynamic disk, storage pool, disk pool, NTFS file system and its features – file permissions, quota, VSS, offline files , machine storage and virtual networks.IPv4 and IPv6 , DNS – Forward and reverse lookup, primary/secondary/stub zone, forwarders, root hints, caching only DNS, Dynamic DNS.

UNIT-II

Configure security policies, Configure application restriction policies , Configure DCS to monitor servers, VMs, networking, real time performance, Configure file and disk encryption

UNIT-III

Configure advanced file services, Implement Dynamic Access Control (DAC),Configure and optimize storage, Bare metal recovery, Understanding Windows booting and troubleshooting booting issues, Configuring Hyper-V site level fault tolerance

UNIT-IV

Advanced DHCP, Advanced DNS, Active Directory Forest trust relationship, Active Directory sites and services, Active Directory Certificate services, Active Directory Rights Management Services (ADRMS). Design an automated server installation strategy, Plan and implement a server deployment infrastructure, plan and implement server upgrade and migration.

UNIT-V

Plan and implement failover clustering, Plan and implement highly available network services, Plan and implement highly available storage solution, Plan and implement highly available server roles, Plan and implement a business continuity and disaster recovery solution, Plan and implement virtualization hosts, Plan and implement virtualization guests.

Practical:

1. Installing windows server 2012.
2. Creating and configuring virtual machines.
3. Deployment and configuration of DHCP.
4. Installing Active Directory domain controllers, Active Directory user group.
5. Configure Windows Firewall.
6. Deploy and manage Windows Deployment Services (WDS).
7. Install and configure Windows Server Update Service (WSUS).

8. Configure Distributed File system (DFS).
9. Configure File Server Resource Manager (FSRM).
10. Configure Network Load Balancing (NLB).
11. Configuring Windows server backup tool.
12. Configure failover clustering.
13. Manage Virtual Machine.
14. Create and manage Group Policy objects (GPOs).

Reference Books:

1.Danielle Ruest, Nelson Ruest, "Microsoft Windows Server 2008: The Complete Reference"
2.William Panek, "MCSA Windows Server 2012 R2 Complete Study Guide", sybex wiley
3.William Stanek, "Windows Server 2012 Inside Out 1st Edition", Microsoft Press
4. Matthew Hester, Chris Henley, "Microsoft Windows Server 2012

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Scheme of Examination

Department: Computer science & Egg.

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
STCS-406	Oracle	2(0+1+1)				25	25	50		2 hr

Syllabus

Theory:

UNIT-I

Retrieving data using the SQL select statement], Reporting aggregated data using the grout function, Using set operators, Manipulating data, Using DDL statements to create and manage tables, Creating other schema

UNIT-II

Managing objects with data dictionary, Controlling User access, Managing schema objects, Manipulating large data sets, Generating report by grouping related data, Managing data in different time zones, Retrieving data using sub queries, Hierarchical retrieval, Regular expression support.

UNIT-III

PL/SQL: Introduction, Declaring Variables, Writing Executable Statements, Interacting with Oracle Server, Writing Control Structures, Working with Composite Data Types, Writing Explicit Cursors, Writing Implicit Cursors, Handling Exceptions, Creating Procedures, Creating Functions, Managing Subprograms, Creating Packages, Manipulating Large Objects, Creating Database Triggers.

UNIT-IV

Oracle:Introduction**,**Installing the Oracle Database Structure, Creating an Oracle Instance, Managing the Oracle Instance, Managing Database Storage Structure, Oracle managed file(OMF), Creating a table space, Administering security, Managing Schema Objects,

UNIT-V

Types of Indexes, Managing Data and Concurrency, Locking Mechanism, Managing Undo Data, Implementing Oracle Database Security, , Proactive Maintenance ADDM, Performance Management, Backup and Recovery Concept Performing Database Recovery, Performing Flashback, Hands on practice, Flashback version query, Moving Data, Oracle Data pump

Practical:

1. Using single row function to customize output.
2. Using sub queries to solve problems.
3. To study Data Definition language Statements.
4. To study Data Manipulation Statements.
5. Study of SELECT command with different clauses.
6. Study of SINGLE ROW functions (character, numeric, Data functions).
7. Study of GROUP functions (avg, count, max, min, Sum).
8. Study of various type of SET OPERATORS (Union, Intersect, Minus).

9. Study of various type of Integrity Constraints.
10. Study of Various type of JOINS.
11. To study Views and Indexes.
12. Performing Database Backups.
14. Configuring the Oracle Network environment
14. Performing Database Recovery

Reference Books:

1.Tom Kyte, "Expert one-on-one Oracle", APress
2. Rick Greenwald and David C. Kreines, "Oracle In A Nutshell", O'Reilly
3.Cary Millsap & Jeff Holt, "Optimizing Oracle Performance", O'Reilly
4.Jonathan Lewis,"Cost Based Oracle Fundamentals" APress
5.Steven Feuerstein and Bill Pribyl , "Oracle PL/SQL", O'Reilly

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Seal