

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

Department: Computer Science & Engg

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS - 501	Data Communication	5(3+2+0)	50	20	30	-	-	100	3 hr	-

Syllabus

Course Objectives:

The students will be able to:

1. Build an understanding of the fundamental concepts of computer networking.
2. Familiarize the student with the basic taxonomy and terminology of the computernetworking area.
3. Introduce the student to advanced networking concepts, preparing the student forentry Advanced courses in computer networking.
4. Allow the student to gain expertise in some specific areas of networking such as thedesign and maintenance of individual networks.

Theory:

UNIT-I

Introduction to data communication: Components , data representation ,data flow and basic model ,data representation .Serial & Parallel transmission , Modes of data transmission, Encoding: Unipolar, Polar .Bipolar line & block codes ,Data compression .Frequency dependant codes, Run length encoding .Relative encoding ,LZ Compression .Image and multimedia compression. Review of analog & digital transmission methods, Nyquist Theorem .

UNIT-II

Multiplexing: FDM, TDM, WDM, Synchronous & Statistical TDM, North American digital multiplexing hierarchy, European TDM, Spread spectrum: Frequency Hopping & Direct Sequence spread spectrum. Terminal handling & polling. Switched Communication Networks: Circuit, Message, Packet & Hybrid Switching, Softswitch Architecture with their comparative study, X.25, ISDN.

UNIT-III

Physical Layer: Introduction, Interface, Standards, EIA-202-D, RJ-34, RJ-11, BNC connector & EIA-449 digital Interface: Connection, specifications & configuration, X.21 Modem: Types, features, signal constellation, block schematic, limited distance, dial up, baseband,line driver, Group Band and Null modems etc., ITU-T V-series modem standards Connecting Devices: Active and Passive Hubs, Repeaters, Bridges, Two & Three layer switches & Gateway. Study of various types of topology and their comparative study and introduction to queing theory.

UNIT-IV

Transmission Media: Transmission line characterestics, distortions, Crosstalk, Guided Media: Twisted Pair, Baseband & Broadband Coaxial.Optical Fibre : Physics and velocity of propagation of

light, Advantages & Disadvantages ,Block diagram .Nodes and classification .Comparision,losses , light source and detectors , Construction, Unguided media : Electromagnetic polarization ,Rays and wavesfront .electromagnetic spectrum and radiation .spherical wavefront and inverse square law , wave attenuation and absorption, optical properties of Radio waves , Terrestrial Propagation of electromagnetic waves , skip distance , free - space path loss .Radio waves , Microwave , Infrared & Satellite Communication system . Telephone Network: Components, LATAs, signaling and Services, Digital Subscriber Line: ADSL, HDSL, SDSL, VDSL, Cable TV network for data transfer.

UNIT-V

Transmission Errors : Content Error, flow integrity error, methods of error control .Error detection .Error correction ,Bit error rate , Error detection methods: Parity checking , Checksum Error Detection .Cyclic Redundancy Check ,Hamming code , Interleaved codes , Block Parity , Convolution code, Hardware Implementation, Checksum .

Course Outcomes:

After completing this course the student must demonstrate the knowledge and ability to:

1. Independently understand basic computer network technology.
2. Understand and explain Data Communications System and its components.
3. Identify the different types of network topologies and protocols.
4. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5. Identify the different types of network devices and their functions within a network
6. Understand and building the skills of subnetting and routing mechanisms.
7. Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

Reference Books:

1. Gupta Prakash C., " Data communication", PHI Learning
2. Tomasi," introduction to Data Communication & Networking, Pearson Education
3. Forouzan, "Data communication", TATA McGraw
4. Godbole/"Data Communication & Network", TMH
5. Miller,"Data Network and Communication", Engage Delmar Learning
6. William Stallings ,"Data & Computer Communication", Pearson Education
7. A.S Tanenbum,"Computer Network", Pearson.

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TBCS - 502	Operating System	6(3+2+1)	50	20	30	25	25	150	3 hr	2 hr

Syllabus

Theory:

RATIONALE:

The purpose of this subject is to cover the underlying concepts Operating System .This syllabus provides a comprehensive introduction of Operating System, Process Management, Memory Management, File Management and I/O management.

PREREQUISITE:-

The students should have general idea about Operating System Concept, types of Operating System and their functionality.

Course objectives:

1. To learn the fundamentals of Operating Systems.
2. To learn the mechanisms of OS to handle processes and threads and their communication
3. To learn the mechanisms involved in memory management in contemporary OS
4. To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols
5. To know the components and management aspects of concurrency management
6. To learn programmatically to implement simple OS mechanisms

UNIT-I

Introduction to System Programs & Operating Systems, Evolution of Operating System (mainframe, desktop, multiprocessor, Distributed, Network Operating System, Clustered & Handheld System), Operating system services, Operating system structure, System Call & System Boots, Operating system design & Implementations, System protection, Buffering & Spooling . Types of Operating System: Bare machine, Batch Processing, Real Time, Multitasking & Multiprogramming, time-sharing system.

UNIT-II

File: concepts, access methods, free space managements, allocation methods, directory systems, protection, organization .sharing & implementation issues, Disk & Drum Scheduling, I/O devices organization, I/O devices organization, I/O buffering, I/O Hardware, Kernel I/O subsystem, Transforming I/O request to hardware operations. Device Driver: Path managements, Sub module, Procedure, Scheduler, Handler, Interrupt Service Routine. File system in Linux & Windows

UNIT-III

Process: Concept, Process Control Blocks(PCB), Scheduling criteria Preemptive & non Preemptive

process scheduling, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, realtime scheduling, operations on processes, threads, interprocess communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization. Deadlock: Characterization, Methods for deadlock handling, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Process Management in Linux.

UNIT-IV

Memory Hierarchy, Concepts of memory management, MFT & MVT, logical and physical address space, swapping, contiguous and non-contiguous allocation, paging, segmentation, and paging combined with segmentation. Structure & implementation of Page table .Concepts of virtual memory, Cache Memory Organization, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation.

UNIT-V

Distributed operating system:-Types, Design issues, File system, Remote file access, RPC, RMI, Distributed Shared Memory(DSM), Basic Concept of Parallel Processing & Concurrent Programming Security & threats protection: Security violation through Parameter, Computer Worms & Virus, Security Design Principle, Authentications, Protection Mechanisms, introduction to Sensor network and parallel operating system. Case study of Unix, Linux & Windows,

Practical:

1. Write a program to implement FCFS CPU scheduling algorithm.
2. Write a program to implement SJF CPU scheduling algorithm.
3. Write a program to implement Priority CPU scheduling algorithm.
4. Write a program to implement Round Robin CPU scheduling algorithm.
5. Write a program to implement classical inter process communication problem (producer Consumer).
6. Write a program to implement classical inter process communication problem (Reader Writers).
7. Write a program to implement classical inter process communication problem (Dining Philosophers).
8. Write a program to implement & Compare Various page replacement algorithms.
9. Write a program to implement Banker' algorithms.
10. Write a program to implement Remote Procedures Call (RCP).

Reference Books:

1. Silberschatz ."Operating system", Willey Pub.
2. Stuart,"Operating System Principles, Design & Applications",Cengage Learning
3. Tannanbaum, "Modern operating system",PHI Learning
4. Dhamdhare, "Operating System",TMH.
5. Achyut S Godbole."Operating System", TMH.
6. William stalling, "operating system" Pearson Edu.
7. Deitel & Deitel, "Operating Systems", Pearson Edu.
8. Flynn & Mchoes, "Operating Systems", Cengage Learning
9. Haldar, "Operating System", Pearson Edu.

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TBCS - 503	Database Management System	6(3+2+1)	50	20	30	25	25	150	3 hr	2 hr

Course Objective

1. To understand the different issues involved in the design and implementation of a database system.
2. To study the physical and logical database designs, database modeling, relational, hierarchical, and network models
3. To understand and use data manipulation language to query, update, and manage a database
4. To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency,
5. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

Syllabus

Theory:

UNIT-I

DBMS Concepts and architecture Introduction, Database approach v/s Traditional file accessing approach, Advantages, of database systems, Data models, Schemas and instances, Data independence, Data Base Language and interfaces, Overall Database Structure, Functions of DBA and designer, ER data mode I: Entities and attributes, Entity types, Defining the E-R diagram. Concept of Generalization, Aggregation and Specialization, transforming ER diagram into the tables. Various other data models object oriented data Model, Network data model, and Relational data model, Comparison between the three types of models.

UNIT-II

Relational Data models: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints. Referential integrity, Intension and Extension, Relational Query languages: SQL-DDL, DML, integrity constraints, Complex queries, various joins, indexing, triggers, assertions, Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union. Types of relational calculus i.e. Tuple oriented and domain oriented relational calculus and its operations.

UNIT-III

Data Base Design: Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and lossy join, problems with null valued and dangling tuples, multivalued dependencies. Query Optimization: Introduction, steps of optimization, various algorithms to implement select, project and join operations of relational algebra, optimization

methods: heuristic based, cost estimation based.

UNIT-IV

Transaction Processing Concepts: - Transaction System, Testing of Serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures. Log based recovery. Checkpoints deadlock handling. Concurrency Control Techniques: - Concurrency Control, locking Techniques for concurrency control, time stamping protocols for concurrency control, validation based protocol, multiple granularity. Multi version schemes, Recovery with concurrent transaction. Introduction to Distributed databases, data mining, data warehousing, Object Technology and DBMS, Comparative study of OODBMS Vs DBMS . Temporal, Deductive, Multimedia, Web & Mobile database.

UNIT-V

Study of Relational Database Management Systems through Oracle/Postgres SQL/MySQL: Architecture, physical files, memory structures, background process. Concept of table spaces, segments, extents and block. Dedicated server, multi threaded server. Distributed database, database links, and snapshot. Data dictionary, dynamic performance view. Security, role management, privilege management, profiles, invoker defined security model. SQL queries, Data extraction from single, multiple tables equi-join, non equi-join, self-join, outer join. Usage of like, any, all, exists, in Special operators. Hierarchical queries, inline queries, flashback queries. Introduction of ANSI SQL, anonymous block, nested anonymous block, branching and looping constructs in ANSI SQL. Cursor management: nested and parameterized cursors, Oracle exception handling mechanism. Stored procedures, in, out, in out type parameters, usage of parameters in procedures. User defined functions their limitations. Triggers, mutating errors, instead of triggers.

Learning Outcome

1. Define program-data independence, data models for database systems, database schema and database instances.
2. Recall Relational Algebra concepts, and use it to translate queries to Relational Algebra statements and vice versa.
3. Identify Structure Query Language statements used in creation and manipulation of Database
4. Identify the methodology of conceptual modeling through Entity Relationship model.
5. Identify the methodology of logical model.
6. Identify the methodology of physical model.
7. Develop an understanding of the differences between OODBMS, ORDBMS and RDBMS and the practical implications of each approach.
8. Analyze and design a real database application.
9. Develop and evaluate a real database application using a database management system.
10. Improve teamwork management skills.
11. Enhance negotiation and discussion skills.

Practical:

1. To implement Different types of DDL statements in SQL.
2. To implement Different types of DM statements in SQL.
3. To implement Different types of DQL statements in SQL.
4. To implement Different types of DCL statements in SQL.
5. To explore 'select' clause using where, order by, between, like, group-by, having etc
6. To implement the concept of Joins in SQL
7. To implement the concept of Indexes and views
8. To Implement the restrictions on the table
9. To implement the concept of Sub Questionries To implement the structure of the table.
10. Main aim is apply SubQuestionries on the table
11. To implement different in-built functions on the created database.

Reference Books:

1. Date C J, "An Introduction To Database System", Pearson Educations
2. Korth, Silbertz,Sudarshan, "Fundamental of Database System", McGraw Hill
3. Rob," Data Base System:Design Implementation & Management", Cengage Learning
4. Elmasri, Navathe, "Fundamentals Of Database Systems", Pearson Educations
5. 5 . Atul Kahate ," Introduction to Database Management System", Pearson Educations
6. Oracle 9i Database Administration Fundamental-I, Volume I, Oracle Press.TMH.
7. Paneerselvam,"DataBase Management System", PHI Learning

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TBCS - 504	Computer Graphics And Multimedia	6(3+2+1)	50	20	30	25	25	150	3 hr	2 hr

Course Objectives:

1. Students will write program functions to implement visibility detection.
2. Students will write programs that demonstrate computer graphics animation.

Syllabus

Theory:

RATIONALE:

The purpose of this subject is to cover the underlying concepts and techniques used in Computer Graphics Animations & Multimedia.

PREREQUISITE :

The students should have general Idea about input/output devices, graphics, text, audio, video and animation. In addition, a familiarity with general mathematical transformations is required.

UNIT-I

Introduction to raster scan displays, Pixels, frame buffer, Vector & Character generation, random scan systems, Graphics Primitives, Display devices, Display file structure, Scan Conversion techniques, line drawing: simple DDA, Bresenham's Algorithm, Circle Drawing Algorithms. Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms

UNIT-II

2D transformation: Translation, Rotation, Scaling, Shearing, Reflection. Inverse Transformation, Homogenous coordinate system, Matrices Transformation, Composite Transformation. Windowing & Clipping: World Coordinate System, Screen Coordinate System, Viewing Transformation, Line Clipping, Cohen Sutherland, Midpoint Line clipping algorithms, Polygon Clipping: Sutherland - Hodgeman, Weiler-Atherton algorithms.

UNIT-III

3D transformations: translation, rotation, scaling. Parallel & Perspective Projection, Types of Parallel & Perspective Projection. Hidden Surface elimination: Depth comparison, Back face detection algorithm, Painters algorithm, Z-buffer algorithm. Curve generation, Bezier and B-spline methods.

UNIT-IV

Basic Illumination Model, Diffuse reflection, Specular reflection, Phong Shading Gourand shading, ray tracing, color models like RGB, YIQ, CMY, HSV.

UNIT-V

Multimedia System: An Introduction, Multimedia hardware, Multimedia System Architecture. Data & File Format standards, i.e RTF, TIFF, MIDI, JPEG, DIB, MPEG, Audio: digital audio, MIDI, processing sound, sampling, compression. Video: Avi, 3GP.MOV, MPEG , compression standards, compression through spatial and temporal redundancy. Multimedia Authoring .

Learning Outcomes:

1. Students will have an appreciation of the history and evolution of computer graphics, both hardware and software. Assessed by written homework assignment.
2. Students will have an understanding of 2D graphics and algorithms including: line drawing, polygon filling, clipping, and transformations. They will be able to implement these. Assessed by tests and programming assignments.
3. Students will understand the concepts of and techniques used in 3D computer graphics, including viewing transformations, hierarchical modelling, colour, lighting and texture mapping. Students will be exposed to current computer graphics research areas. Assessed by tests, homework and programming assignments.
4. Students will be able to use graphics in C++. Assessed by programming assignments.

Practical:

1. Program to draw a Line using DDA Line Algorithm
2. Program to draw a Line using Bresenham's Line Algorithm
3. Program to draw a Circle using Mid - Point Circle Algorithm
4. Program to draw a Circle using Bresenham's Circle Algorithm
5. Program to draw a Circle using Direct Algorithm
6. Program to draw an Ellipse using Mid - Point Ellipse Algorithm
7. Program of Translation Transformation
8. Program of Scaling Transformation
9. Write a program to implement Sutherland hodgeman algorithm for polygon clipping
10. Write a program to implement Cohen Sutherland algorithm for line clipping.

Reference Books:

1. Donald Hearn and M.P. Becker "Computer Graphics" Pearson Pub.
2. Rogers, "Procedural Elements of Computer Graphics", Tata McGraw Hill
3. Foley Vandam, Feiner, Hughes "Computer Graphics Principle & Practice", Pearson Pub.
4. Parekh "Principles of Multimedia" Tata McGraw Hill
5. Prabhat k Andleigh, Kiran Thakral, "Multimedia System Design " PHI Pub.
6. Shuman "Multimedia in Action", Cengage Learning

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TBCS - 505	JAVA Programming & Technology	5(3+2+0)	50	20	30	-	-	100	3 hr	-

Course Objectives:

- Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
- Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.
- Understand the principles of inheritance, packages and interfaces.

Syllabus

Theory:

UNIT-I

Multithreading and Exception Handling: Basic idea of multithreaded programming; The lifecycle of a thread; Creating thread with the thread class and runnable interface; Thread synchronization; Thread scheduling; Daemon thread, Selfish threads; Basic idea of exception handling; The try, catch and throw; throws Constructor and finalizers in exception handling; Exception Handling

UNIT-II

Input/Output : Exploring Java i.o., Directories, stream classes The Byte stream : Input stream, output stream, file input stream, file output stream, print stream, Random access file, the character streams, Buffered reader, buffered writer, print writer, serialization. JDBC: JDBC-ODBC bridge; The connectivity model; The driver manager; Navigating the resultset object contents; java.sql Package; The JDBC exception classes; Connecting to Remote database.

UNIT-III

Networking & RMI: Java Networking : Networking Basics : Socket, Client server, reserved sockets, proxy servers, Inet address, TCP sockets, UDP sockets. ; RMI for distributed computing; RMI registry services; Steps of creating RMI Application and an example. Collections: The collections framework, collection interfaces, collection classes.

UNIT-IV

JSP: JSP Tag library, Basic HTML Tags, JSP Page Life-cycle, jsp-API, JSP scripting elements, jsp direct elements, jsp exception, elements, in JSP, the first Dynamic web page using JSP.

UNIT-V

Servlets :What is a Servlet? Java Servlets, Servlet Lifecycle,Servlet API,Session tracking in servlet,servlet filter, Servlet Context, Building the first Servlet, Session management, Deploying the Servlet, Examples – Servlets

Course Outcomes:

- 1. Identify classes, objects, members of a class and relationships among them needed for a specific problem Identify .**
- 2. Write Java application programs using OOP principles and proper program structuring. Demonstrate the concepts of polymorphism and inheritance .**
- 3. Write Java programs to implement error handling techniques using exception handling .**

Books:

Text Books:

- 1. Herbert Schildt, “Java the Complete Reference”, TMH. 8th edition.**
- 2. Kathy Sierra & Bert Bates, “Head First Java”, O’Reilly, 2nd Edition.**

Reference Books:

- 1. E Balagurusamy, “Programming with Java A Primer”, TMH, 4th edition.**
 - 2. Patrick Naughton, “Java Handbook”, Osborne McGraw-Hill**
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STCS-507	HTML5	3(1+0+2)	30	10	10	50	50	150	1 hr	2 hr

Syllabus

Theory:

UNIT-I

Introduction: Elements , Attributes , Headings , Paragraphs , Formatting , Fonts , Styles , Links , Images , Tables , Lists , Forms Frames Iframes ,Colors, Colornames , Colorvalues , Quick List , Layout , Doctypes , Head , Meta , Scripts , Entities URLs , URL Encode , Media , Audio , Object , Video , YouTube , Media Tags.

UNIT-II

HTML5: Introduction, New Elements, Video ,Video/DOM , Audio ,Drag and Drop , Canvas , SVG , Canvas vs. SVG , Geolocation , Web Storage ,App Cache ,Web Workers , SSE Tags.

UNIT-III

CSS Introduction, CSS Syntax ,CSS Id & Class ,CSS Styling ,Styling Backgrounds ,Styling Text, Styling Fonts ,Styling Links ,Styling Lists ,Styling Tables ,CSS Box Model ,CSS Box Model CSS Border ,CSS Outline ,CSS Margin ,CSS Padding.

UNIT-IV

CSS Advanced: CSS Grouping/Nesting ,CSS Dimension ,CSS Display ,CSS Positioning ,CSS Floating ,CSS Align ,CSS Navigation Bar ,CSS Image Gallery ,CSS Image Opacity ,CSS Image Sprites ,CSS Media Types ,CSS hacking.

UNIT-V

FTP Management: Understanding FTP ,Setting up FTP Server (Live) ,Uploading and downloading FTP contents .

Practical:

1. Practise on basic Attribute and formatting of HTML5.
2. Creating a Site Using HTML5.
3. Adding Some Basic CSS and JavaScript
4. Navigation, Forms, and Validation
5. Adding Style and Layout with CSS3

7. Using Video and Adding Graphical Elements with a Canvas
8. Drawing More Graphical Elements with SVG
9. Creating tables and lists.
10. Creating forms and frames.
11. Deploying application on Web Server.
12. Installing NetWare 6.5.
13. Configure FTP Server
14. Uploading and downloading FTP contents

Reference Books:

1. Thomas Powell., " HTML & CSS: The Complete Reference 5th edition "
 2. Ian Lloyd., " The Ultimate HTML Reference Hardcover, 15 May 2008 ",
 3. Html5, Black Book:Covers Css3,Javascript,Xml,Xhtml,Ajax,Php And JQuery
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STCS-508	ASP.Net	3(1+0+2)	30	10	10	50	50	150	1 hr	2 hr

Syllabus

Theory:

UNIT-I

Overview of the ASP.NET, Framework, Setting up and Installing ASP.NET, Microsoft SQL Server 2008, Coding Standards, HTML, CSS & JavaScript.

UNIT-II

Asp.Net Standard Controls, Asp.Net, Asp.Net Validation Controls, Javascript Validation, Designing Websites with master pages, Using the Rich Controls.

UNIT-III

SQL Server Basic, Overview of Data Access, C#, Using the Grid View Control, Using the Details View and Form View Controls, Using Repeater and Data List Controls, Using Navigation Controls.

UNIT-IV

Working with XML and Web Services, AJAX (Asynchronous JavaScript and XML)

UNIT-V

FTP Management, Sending Emails, Deployment, Live Project.

Practical:

1. A. Create a page in ASP.Net using VB.Net or C#, to choose a color from drop-down-list and display a message "you have chosen 'color name'" in same color that you choose. Also add a color toolbox on the form to add color to button. B. Create a page in ASP.Net using VB.NET or C# that takes name and message from the user and choose a color by radio button, select a style for ex.-bold, italic, underline from the checkbox and display in label control, when you clicked for ex.-bold, italic, underline from the checkbox and display in label control, when you on display button. And clear the information when you clicked on clear button
2. Create a page in ASP.Net using VB.NET or C# that take a student name from the user, add that name in list-box control. And delete the chosen name from the list-box.
3. Create a page in ASP.Net using VB.NET or C#, to calculate compound interest. Take a compound frequency from drop-down-list. For example-Annual value-1, quarterly value-4, monthly value-12, daily value-365. Formula: $Temp = (1 + rate/period)$ Result = $Principal \text{ amount} + Pow(Temp, (year * period))$
4. Create a page in ASP.Net using VB.NET or C#, for book sales. Enter the quantity, title and price of the book. Calculate the extended price, discount (15%) and after discount, the actual price of the book. Show the summery of book sales. (Like total no of books, total discount given total discounted amount and average discount.) You will need command buttons-

calculate,clear sale.

5. Create a page in ASP.Net using VB.Net or C#, using HTML Server controls that take user name, address, and city, state and country name from the user and display it.
6. Create a page in ASP.Net using VB.Net or C#, using HTML Server controls that convert given currency into another selected currency. For that you need a drop-down-list.
7. Create a page in ASP.Net using VB.NET or C#, which generate a greeting card and display a greeting message in selected font. For that you need a drop-down-list for font selection.
8. Create a page in ASP.Net using VB.NET or C# that take Name, Password, Email add. & age from the user. Put appropriate validation. Show the summary of invalid validation.
9. Create a page in ASP.Net using VB.NET or C# to create a custom validation control that check even number.
10. Create a page in ASP.Net using VB.NET or C# that displays registration form. Fields are First Name, Last Name, Email, Password, repass, Age (dd-mm-yyyy), Ph. No., address, city, with appropriate validation controls such as email validation, city to choose from combo box options.
11. Create a page in ASP.Net using VB.NET or C# that takes no. of rows and columns from the user and make a table using Grid Control.
12. Design a database component for Account maintenance. The component should handle the following functionality Adding and Updating Account.
13. Create a page in ASP.Net using VB.NET or C#, to add a list box control to a Web forms page through coding which prompts for adding or deleting Name of fruits through indexing. The list box control properties should be user defined i.e. color, font etc. of the list box control.

Reference Books:

1. Asp.net 3.5 : a beginner's guide-william b.sanders
 2. Asp.net - the complete reference-matthew macdonald
 3. Asp.net 3.5 ajax unleashed-robert foster
 4. Asp.net 4.5, covers c# and vb codes, black book (black book series)- kogent learning solutions inc.
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STCS-509	Linux/Unix	3(1+0+2)	30	10	10	50	50	150	1 hr	2 hr

Syllabus

Theory:

UNIT-I

Overview of Unix/Linux: Concepts, Unix/Linux Installation Process, Hardware Requirements for Unix/Linux. Advantages of Unix/Linux, Reasons for Popularity and Success of Linux/Unix Operating System, Features of Linux/Unix Operating System, Kernel, Kernel Functions, The Shell Basic Commands, Shell Programming:-Shell Variables, Branching Control Structures, Loop-Control Structure, Continue and break Statements, Sleep Command, Debugging Script.

UNIT-II

File System: Definition of File System, Defining Geometry, Disk Controller, Solaris File System, Disk Based File Systems, Network-Based File Systems, Virtual File systems, UFS File System, The Boot Block, The Super Block, The Inode, Tuning File System, Repairing File System.

UNIT-III

Process Control: Viewing a Process, Command to display Process, Process Attributes, Process States, Process Fields, PS Commands options, PGREP, PRSTAT, CDE Process Manager, Scheduling Process, Scheduling Priorities, Changing the Priority of a time-sharing process, Killing Process.

UNIT-IV

System Security: Physical Security, Controlling System Access, Restricted Shells Controlling File Access, File Access Commands, Access Control List(ACLs), Setting ACL Entries, Modifying ACL entries on a file, Deleting ACL entries on a file, Restricting FTP, Securing Super User Access, Restricting Root Access, Monitoring super user Access, TCP Wrappers.

UNIT-V

Dynamic Host Configuration Protocol: Introduction, DHCP Leased Time, DHCP Scopes, DHCP IP Address, Allocation Types, Planning DHCP Deployment, DHCP Configuration files, Automatic Startup of DHCP Server, Configuration of DHCP Clients, Manually Configuring the DHCP.

Practical:

1. Installation of Unix/Linux operating system.
2. Study of logging/logout details.
3. Study of Unix/Linux general purpose utility command list obtained from (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger,

- pwd, cal, logout, shutdown) commands.
4. Study of vi editor.(<http://www.tutorialspoint.com/unix/pdf/unix-vi-editor.pdf>)
 5. Study of Bash shell, Bourne shell and C shell in Unix/Linux operating system.
 6. Study of Unix/Linux file system (tree structure).
 7. Study of .bashrc, /etc/bashrc and Environment variables.
 8. Write a C program to check whether the given string is palindrome or not using Command line substitution.
 9. Write a C program to emulate the UNIX ls-l command.
 10. Write a C program to check the given integer is prime or not.
 11. Write a C program to display Largest of three numbers.
 12. Write a C program to check whether the given number is Avogadro number or not.
 13. Write a C program to find the Factorial of a given number.
 14. Write a shell script program to display list of user currently logged in. 15. Write a shell script program to display "HELLO WORLD".
 15. Write a shell script program to develop a scientific calculator.
 - 16.. Write a shell Script program to check whether the given number is even or odd.
 17. Shell script program to count number of files in a Directory.
 18. Shell script program to copy contents of one file to another.
 19. Create directory, write contents on that and Copy to a suitable location in your home directory.
 20. Use a pipeline and command substitution to set the length of a line in file to a variable.

Reference Books:

1. Venkatesh Murthy, "Introduction to Unix SShell", Pearson Edu
2. Forouzan, "Unix SShell Programming", Cengage Learning
3. Sumitab Das, "Unix Concept & Application", TMH
4. Gopalan, Shivaselvan, "Beginners Guide to Unix" PHI Learning

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: Computer Science & Engg

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS - 506	Computer Programming (Unix/Linux-Lab.)	1(0+0+1)	-	-	-	25	25	50	-	2 hr

Pattern:

Syllabus

Theory:

RATIONALE:

The purpose of this subject is to cover the concepts, Installation Process, Hardware Requirements and features of Unix/Linux. Basic Commands & Shell Programming.

PREREQUISITE

The students should have general Idea about computing fundamentals & operating system and at least one year of experience in programming .

UNIT-I

Overview of Unix/Linux: Concepts, Unix/Linux Installation Process, Hardware Requirements for Unix/Linux. Advantages of Unix/Linux, Reasons for Popularity and Success of Linux/Unix Operating System, Features of Linux/Unix Operating System, Kernel, Kernel Functions, The Shell Basic Commands, Shell Programming:-Shell Variables, Branching Control Structures, Loop-Control Structure, Continue and break Statements, Sleep Command, Debugging Script. Use of Linux as web-server, file server, directory server, application server, DNS server, SMTP server, Firewall, Proxy server.

UNIT-II

File System: Definition of File System, Defining Geometry, Disk Controller, Solaris File System, Disk Based File Systems, Network-Based File Systems, Virtual File systems, UFS File System, The Boot Block, The Super Block, The Inode, Tuning File System, Repairing File System.

UNIT-III

Process Control: Viewing a Process, Command to display Process, Process Attributes, Process States, Process Fields, PS Commands options, PGREP, PRSTAT, CDE Process Manager, Scheduling Process, Scheduling Priorities, Changing the Priority of a time-sharing process, Killing Process.

UNIT-IV

System Security: Physical Security, Controlling System Access, Restricted Shells Controlling File Access, File Access Commands, Access Control List(ACLs), Setting ACL Entries, Modifying ACL entries on a file, Deleting ACL entries on a file, Restricting FTP, Securing Super User Access, Restricting Root Access, Monitoring super user Access, TCP Wrappers.

UNIT-V

Dynamic Host Configuration Protocol: Introduction, DHCP Leased Time, DHCP Scopes, DHCP

IP Address, Allocation Types, Planning DHCP Deployment, DHCP Configuration files, Automatic Startup of DHCP Server, Configuration of DHCP Clients, Manually Configuring the DHCP.

Case Study: Installation of Linux, Customization of Linux, Installation of SAMBA, APACHE, TOMCAT, Send MAIL, Postfix, Implementation of DNS, LDAP services, Firewall, Proxy server

Practical:

1. To Study basic & User status Unix/Linux Commands.
2. Study & use of commands for performing arithmetic operations with Unix/Linux.
3. Create a file called wlcc.txt with some lines and display how many lines, words and characters are present in that file.
4. Append ten more simple lines to the wlcc.txt file created above and split the appended file into 3 parts. What will be the names of these split files? Display the contents of each of these files.
How many lines will be there on the last file?
5. Given two files each of which contains names of students. Create a program to display only those names that are found on both the files.
6. Create a program to find out the inode number of any desired file.
7. Study & use of the Command for changing file permissions.
8. Write a pipeline of commands, which displays on the monitor as well as saves the information about the number of users using the system at present on a file called usere.ux.
9. Execute shell commands through vi editor.
10. Installation, Configuration & Customizations of Unix/Linux.
11. Write a shell script that accepts any number of arguments and prints them in the reverse order.
12. Write a shell script to find the smallest of three numbers that are read from the keyboard.
13. Write a shell script that reports the logging in of a specified user within one minute after he/she logs in. The script automatically terminates if the specified user does not login during a specified period of time.
14. Installation of SAMBA, APACHE, TOMCAT.
15. Implementation of DNS, LDAP services,
16. Study & installation of Firewall & Proxy server.

Reference Books:

1. Venkatesh Murthy, "Introduction to Unix SShell", Pearson Edu
2. Forouzan, "Unix SShell Programming", Cengage Learning
3. Sumitab Das, "Unix Concept & Application", TMH
4. Gopalan, Shivaselvan, "Beginners Guide to Unix" PHI Learning
5. Venkateshwavle, "Linux Programming Tools UnveiPed", BS Publication.
6. Richard Peterson, "Linux Complete Reference", TMH
7. Richard Peterson, "Unix Complete Reference", TMH

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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	Term Work			
TBCS - 507	Seminar	1(0+0+1)	-	-	-	-	50	50	-	2 hr

OBJECTIVE OF GD AND SEMINAR :

Is to improve the MASS COMMUNICATION and CONVINCING/ understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

EVALUATION:

Will be done by assigned faculty based on group discussion and power point presentation.

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

Department: Computer Science & Engg.

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS - 601	Micro Processor & Interfacing	6(3+2+1)	50	20	30	25	25	150	3 hr	2 hr

Course Objectives:

- **To understand basic architecture of 16 bit and 32 bit microprocessors.**
- **To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.**
- **To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.**
- **To understand RISC and CISC based microprocessors.**
- **To understand concept of multi core processors.**

Syllabus

Theory:

UNIT - I

Evolution of microprocessor, single chip micro computers, Micro processor Application, Microprocessor and its architecture, addressing modes, instruction, Instruction sets, Arithmetic and Logic Instruction, Program control instruction, Introduction - 8086 family, procedure and macros, connection , Timing and Troubleshooting interrupt, 80286, 80836 and 80486 micro processor system concept.

UNIT - II

Microprocessor Cycle, AIU, Timing and control Unit, Register data, Address bus, Pin Configuration, Intel 8086 instruction, Opcode and operands, limitation word size. Programming the microprocessor Assembly language, The Pentium and Pentium Pro Micro Processor with features, Pentium II, Pentium III and Pentium - IV Microprocessor with software changes.

Instruction set for Intel 8086, Introduction Intimation and data formats, Addressing modes, Status flags, Symbols and abbreviations, programming of microprocessors, Assembly language, high level language, areas of application of various languages, Stacks, Sub routines system, software, commands in assembly language, software Development, Debugging program, Modular programming, Structured programming, Top-down, Bottom- up design , MACRO microprogramming

UNIT- III

Assembly language programming with Examples like Addition of 8/16-bit Binary number, subtraction of 8/16 bit binary number, Address partitioning, addressing mode, type of addressing

mode, memory and I/o interfacing, Data transfer schemes, Interfacing device and I/o devices I/o ports, Basic I/o Interfacing MDS, Micro controllers, I/o processor and co- processors ,Microcomputer Development system, Single chip micro computers, Intel 8748 Intel 8051, inter 8096, Intel 8049intel 2920/2921, I/o processor UPI-425,UPI-41,42, Co-processor, math processor math co-processor - 8087, 80287, 80387DX 803875x.

UNIT - IV

Bus Interface I/o port Addressing, decoding 8279, Programmable key board/display interface, 8254 Internal Timer, 16550 programmable communication interface A/D, 8259A Programmable Interrupt Controller, 8237 DMA Controller, Shared bus operation, disk Memory system Video display. ISA Bus, Extended ISA (EISA) and VeSa Local Buses, Peripheral Component Inter Connect (Pc I) Bus, Parallel Printer interface (LPT) Universal serial Bus (USB) Accelerated graphics port (AGP),Programmable Communication interfere 8251 VSART CRT Controller 8275, 6854, Floppy disk Controller 8272, I/o processor 8089.

UNIT - V

Memory Unit, RAM,SRAM, DRAM,ROM, PROM EPROM, EEPROM Nonvolatile RAM semiconductor Technology for memory, Shift register, Magnetic Memory, Tap, disc, main memory and secondary memory cache memory, program memory and Data Memory, Real and virtual memory Buses, memory Addressing capacity of CPU, processing speed of computer.

Course Outcomes:

- Write programs to run on 8086 microprocessor based systems.
- Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor.
- Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
- Distinguish between RISC and CISC processors.
- Understand multi core processor and its advantages.

Practical:

1. Add a data byte located at offset 0500H in 2000H segment to another data byte available at 06000H in same segment and store the resulting 0700H in same segment?
2. Add the contents of memory location 2000H, offset 0500H to the contained of accumulator.
3. Write a program to find the average to two temperature name HI-TEMP and LO- TEMP and puts the result in the memory location AV-TEMP.
4. Find out the largest number from an unordered array of sixteen 8-bit numbers stored sequentially in the memory locations starting at offset 0500H in the segment 2000H.
5. Move a byte string, 16 bytes long, from the offset 0200H to 0300H in the segment 7000H.
6. Write a program to add a profit factor to each element in a cost array and puts the result in a PRICES array, where profit factor is 15H and COST =20H, 28H, 15H, 26H, 19H, 27H, 16H, 29H.
7. Write a program to find out the number of positive numbers and negative numbers from a given series of signed numbers.
8. Write a program that performs the addition, subtraction, multiplications, division of the given operands. Perform BCD operation for addition and subtraction.
9. A Program to find out the number of even and odd numbers from a given series of 16 bit hexad4ecimal numbers.

Reference Books:

1. Douglas V Hall, "Microprocessors and interfacing - Programming & Hardware" TMH.
2. Barry B. Brey, "The intel Microprocessor - 8086", Pearson Education.
3. Kenneth J.Ayala,"The 8086 Microprocessor: Programming & Interfacing The PC",Cengage Learning.

4. Krishna Kant, "Microprocessors and Microcontrollers", PHI Learning.
 5. A.K.Ray KM Bhurchandi, "Advanced Microprocessor and peripherals" McGraw Hill.
 6. R.S. Gaonkar /'Microprocessors and interfacing", TMH
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AISECT UNIVERSITY, Bhopal, (M.P.)
Scheme of Examination

Department: Computer Science & Engg

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS – 602	Principles Of Programming Languages	5(3+2+0)	50	20	30	-	-	100	3 hr	-

Course Objectives:

- To discuss the skills in analyzing and using the features of programming languages.
- To recall the preliminary concepts like context-free grammar, Backus-Naur form, Parse trees.
- To understand the data types of different programming languages. 5. Discuss various logic programming and functional programming languages features.
- To understand the variable declarations in programming languages, in particular to binding, scope, and substitution of variables.
To introduce the power of Python scripting language.

Syllabus

Theory:

UNIT-I

Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms - Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation - Compilation and Virtual Machines, programming environments. Issues in Language Translation: Syntax, Semantics, Stages, analysis and synthesis, Parse Tree, CFG and BNF grammar.

UNIT-II

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names ,Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Sequence control with Expressions, Conditional Statements, Loops, Exception handling.

UNIT-III

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and

dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic subprograms, design issues for functions overloaded operators, co routines.

UNIT-IV

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, Static and Stack-Based Storage management. heap based storage management. Garbage Collection. Object oriented programming in small talk, C++, Java, C#, PHP, Perl . Concurrency: Subprogram level concurrency, semaphores, monitors, message passing, Java threads, C# threads.

UNIT - V

Exception handling, Exceptions, exception Propagation, Exception handler in C++ and Java. Logic Programming Language : Introduction and overview of logic programming, basic elements of prolog, application of logic programming. Functional Programming Languages: Introduction, fundamentals. Introduction to 4GL.

Course Outcomes:

- Master syntax related concepts including context - free grammars, parse trees, recursive parsing, printing, and interpretation.
- Master analyzing semantic issues associated with function implementations, including variable binding, scoping rules, parameter passing, and exception handling.
- Be familiar with design issues of object - oriented and functional languages.
- Be familiar with language abstraction constructs of classes, interfaces, packages, and procedures.
- Expose functional and scripting languages..

Reference Books:

1. Sebesta, "Concept of programming Language", Pearson Edu.
2. Louden, "Programming Languages: Principles & Practices", Cengage Learning
3. Tucker, " Programming Languages: Principles and paradigms ", Tata McGraw -Hill
4. Terrance W Pratt, "Programming Languages: Design and Implementation" Pearson Edu.
5. Cavlo Ghezzi & Mehdi Jazayeri " Programming Languages Concepts", Willey India
6. E Horowitz, "Programming Languages", 2nd Edition, Addison Wesley

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

Department: Computer Science & Engg

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			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS – 603	Software Engineering & Project Management	6(3+2+1)	50	20	30	25	25	150	3 hr	2 hr

Course Objectives:

- **Be employed in industry, government, or entrepreneurial endeavors to demonstrate professional advancement through significant technical achievements and expanded leadership responsibility;**
- **Demonstrate the ability to work effectively as a team member and/or leader in an ever-changing professional environment.**
- **Progress through advanced degree or certificate programs in computing, science, engineering, business, and other professionally related fields.**

Syllabus

Theory:

UNIT -I

THE SOFTWARE PRODUCT AND SOFTWARE PROCESS:

Software Product and Process Characteristics, Software Process Models: Linear Sequential Model, Prototyping Model, RAD Model, Evolutionary Process Models like Incremental Model, Spiral Model, Component Assembly Model, RUP and Agile processes. Software Process customization and improvement, CMM, Product and Process Metrics

UNIT -II

REQUIREMENT ELICITATION, ANALYSIS, AND SPECIFICATION

Functional and Non-functional requirements, Requirement Sources and Elicitation Techniques, Analysis Modeling for Function-oriented and Object-oriented software development, Use case Modeling, System and Software Requirement Specifications, Requirement Validation, Traceability

UNIT-III

SOFTWARE DESIGN

The Software Design Process, Design Concepts and Principles, Software Modeling and UML, Architectural Design, Architectural Views and Styles, User Interface Design, Function-oriented Design, SA/SD Component Based Design, Design Metrics

UNIT-IV

SOFTWARE ANALYSIS AND TESTING

Software Static and Dynamic analysis, Code inspections, Software Testing Fundamentals, Software Test Process, Testing Levels, Test Criteria, Test Case Design, Test Oracles, Test Techniques, Black-Box Testing, White-Box Unit Testing and Unit Testing Frameworks, Integration Testing, System

Testing and other Specialized Testing, Test Plan, Test Metrics, Testing Tools. , Introduction to Object-oriented analysis, design and comparison with structured software engg.

UNIT-V

SOFTWARE MAINTENANCE & SOFTWARE PROJECT MEASUREMENT

Need and Types of Maintenance, Software Configuration Management (SCM), Software Change Management, Version Control, Change control and Reporting, Program Comprehension Techniques, Re-engineering, Reverse Engineering, Tool Support. Project Management Concepts, Feasibility Analysis, Project and Process Planning, Resources Allocations, Software efforts, Schedule, and Cost estimations, Project Scheduling and Tracking, Risk Assessment and Mitigation, Software Quality Assurance (SQA). Project Plan, Project Metrics.

Course Outcomes:

- Understand analysis and design of complex systems.
- Apply software engineering principles and techniques.
- Develop, maintain and evaluate large-scale software systems.
- Produce efficient, reliable, robust and cost-effective software solutions.
- Perform independent research and analysis.
- Communicate and coordinate competently by listening, speaking, reading and writing English for technical and general purposes.
- Work as an effective member or leader of software engineering teams.
- Manage time, processes and resources effectively by prioritizing competing demands to achieve personal and team goals Identify and analyzes the common threats in each domain.
- Understand and meet ethical standards and legal responsibilities.

practical:

1. Introduction and Project Definition
2. Study of Software Processes and Visual Source Safe
3. Study of Project Planning and Management
4. Prepare (SRS) for chosen problem
5. Developing Use case diagram and UML for Chosen System
6. Analysis System modeling
7. Documenting Use Cases and Activity Diagrams
8. Study of Object-Oriented Analysis: Discovering Classes.
9. Develop Interaction Diagrams: Sequence & Collaboration Diagrams
10. Designing Software Architecture and Object-Oriented Design for chosen problem
11. Develop a State Transition Diagrams for chosen system.
12. Prepare Implementation Diagrams: Component & Deployment Diagrams for chosen problem

Reference Books:

1. Pankaj Jalote ,”An Integrated Approach to Software Engineering”, Narosa Pub, 2005
2. Rajib Mall, "Fundamentals of Software Engineering” Second Edition, PHI Learning
3. R S. Pressman /’Software Engineering: A Practitioner’s Approach”, Sixth edition 2006, McGraw-Hill.
4. Sommerville, ” Software Engineering ”, Pearson Education.
5. Richard H.Thayer, ” Software Engineering & Project Managements ”, Willey India
6. Waman S.Jawadekar, ”Software Engineering”, TMH
7. Schwalbe, ”IT Project Managements”, engage Learning.

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AISECT UNIVERSITY, Bhopal, (M.P.)
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TBCS – 604	Computer Networking	6(3+2+1)	50	20	30	25	25	150	3 hr	2 hr

Course Objectives:

- **Students are familiar with the basics of data communication.**
- **Students are familiar with various types of computer networks.**
- **Students have experience in designing communication protocols. be exposed to the TCP/IP protocol suite**

Syllabus

Theory:

UNIT - I

Computer Network: Definitions, goals, components, structure, Architecture, Classifications & types, Growth, Complexity and applications etc. Layered Architecture: Protocol hierarchy, Connection Oriented & Connectionless Services, Service permissive Design issues & its functionality. ISO-OSI Reference Model: Principle, Model, Descriptions of various layers and its comparison with TCP/IP. Network standardization. Examples of Networks: Telecommunication Network, Corporate Networks, Connection oriented network i.e., X.25, Frame relay & ATM, Wireless LAN 802.11, internet, Intranet, Extranet, SNA & DNA etc.

UNIT - II

Data Link Layer: Need, Services Provided, Framing & its methods, Flow Control, Error control. DLL Protocol: Elementary & Sliding Window. Piggybacking & Pipelining. Protocol verification: Finite State Machine Models & Petri net models. Example in Data Link Layers: HDLC & Internet. Comparison of BISYNC and HDLC Features. Bridges and layer-2 switches

UNIT-III

MAC Sub layer: Static & Dynamic channel allocation, Media access control for LAN & WAN. Classification of MAC Sub layer protocol, Study of various collision, Collision free & limited contention protocol i.e., ALOHA: pure, slotted, CSMA, CSMA/CD, CSMA/CA, Bit Map, Binary count down, BRAP, MLMA, Adaptive tree walk & urn protocol etc. IEEE 802 standards for LAN & MAN & their comparison. Ethernet: Cabling, Binary exponentials algorithms, performance fast Ethernet, Gigabit Ethernet, FDDI. Wireless LANs, Broadband Wireless, Bluetooth: Architecture, Application & Layering.

UNIT - IV

Network Layer: Need, Services Provided, Design issues, Routing algorithms: Least Cost Routing algorithm, Dijkstra's algorithm, Bellman-ford algorithm, Hierarchical Routing, Broadcast Routing, Multicast Routing, Routing for mobile hosts, Routing in Ad Hoc Networks Routing

Strategies, Congestion Control Algorithms: General Principles of Congestion control, Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram subnets. IP protocol, IP Addresses, Comparative study of IPv4 & IPv6, Mobile IP.

UNIT-V

Processes to Processes Delivery - Transmission Control Protocol (TCP) - User Datagram Protocol, Data Traffic, Congestion Control and Quality of Service, Techniques to improve QOS, Integrated Services, and Differentiated Services. Network Security: Cryptography, Message Security, Digital Signature, User Authentication, Key Management, Security Protocols in Internet, DNS,SMTP,FTP, HTTP, WWW, Virtual Terminal Protocol, VoIP: Basic IP Telephone System,H.323 Characteristic & Layering, SIP Characteristics, Method & Sessions.

Course Outcomes:

- Master the terminology and concepts of the OSI reference model and the TCP-IPreference model.
- To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.
- To be familiar with wireless networking concepts.
- To be familiar with contemporary issues in networking technologies.
- To be familiar with network tools and network programming .

Practical:

1. To study various types of connectors.
2. To study of different type of LAN equipments.
3. Study and verification of standard Network topologies i.e. Star, Bus, Ring etc
4. LAN installations and their Configurations.
5. To implement various types of error correcting techniques.
6. To implement various types of framing methods.
7. To implement various types of DLL protocols.
8. To study & configure various types of router & Bridges.
9. To implement various types of routing algorithm.
10. To study of Tool Command Language(TCL).

Reference Books:

1. Tanenbaum A. S ,”Computer Networks “Pearson Education.
2. Stalling W, “Computer Networks”, Pearson Education
3. Douglas E. Comer & M.S Narayanan,” Computer Network & Internet”, Pearson Education.
4. Behraj A Forouzan,”Data Communication & Networking”, McGraw-Hill.
5. Natalia Olifar & Victor Olifer,” Computer Networks”, Willey Pub.
6. Prakash C. Gupta, “Data Communications and Computer Networks”, PHI.
7. Bertsekas & Gallager “Data Network” , PHI.
8. 8 Gallo, “Computer Communication & Networking Technologies”, engage Learning.

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

Department: Computer Science & Engg

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS – 605	Advance Computer Architecture	5(3+2+0)	50	20	30	-	-	100	3 hr	-

Course Objectives:

- Broad understanding of the design of computer systems, including modern architectures and alternatives.
- Understanding of the interaction amongst architecture, applications and technology.
- Understanding of a framework for evaluating design decisions in terms of application requirements and performance measurements.
- A historical perspective on computer system design.

Syllabus

Theory:

UNIT-I

Flynn's Classification, System Attributes to Performance, Parallel computer models - Multiprocessors and multicomputer, Multifactor and SIMD Computers. Data and resource dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain size and latency, Control flow, data flow and Demand driven mechanisms. Static interconnection networks, Dynamic interconnection Networks: Bus Systems, Crossbar Switch, Multiport Memory, Multistage and Combining Networks

UNIT- II

Instruction set architecture, CISC Scalar Processors , RISC Scalar Processors, VLIW architecture, Memory Hierarchy, Inclusion, Coherence and Locality, Memory capacity planning. Interleaved memory organization- memory interleaving, pipelined memory access, Bandwidth and Fault Tolerance. Backplane Bus System :Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt.

UNIT-III

Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, pipeline hazards, Dynamic instruction scheduling.

UNIT-IV

Cache coherence, Snoopy protocols, Directory based protocols. Message routing schemes in multicomputer network, deadlock and virtual channel. Vector Processing Principles, Vector

instruction types, Vector-access memory schemes. Vector supercomputer architecture, SIMD organization: distributed memory model and shared memory model. Principles of Multithreading: Multithreading Issues and Solutions, Multiple-Context Processors.

UNIT-V

Parallel Programming Models, Shared-Variable Model, Message-Passing Model, Data- Parallel Model, Object-Oriented Model, Functional and Logic Models, Parallel Languages and Compilers, Language Features for Parallelism, Parallel Programming Environment, Software Tools and Environments.

Course Objectives:

- Describe the principles of computer design.
- Classify instruction set architectures.
- Describe the operation of performance enhancements such as pipelines.
- dynamic scheduling, branch prediction, caches, and vector processors.
- Describe the operation of virtual memory.
- Describe modern architectures such as RISC, Super Scalar, VLIW (very large instruction word), and multi-core and multi-CPU systems.
- Compare the performance of different architectures.
- Improve application performance for different CPU architectures.
- Develop applications for high performance computing systems.

Reference Books:

1. Kai Hwang, "Advanced computer architecture", TMH.
2. J.P.Hayes, "computer Architecture and organization"; MGH.
3. V.Rajaraman & C.S.R.Murthy, "Parallel computer"; PHI Learning.
4. Kain,"Advance Computer Architecture: - A System Design Approach", PHI Learning
5. M.J Flynn, "Computer Architecture, Pipelined and Parallel Processor Design"; Narosa Publishing.
6. Hwang and Briggs, "Computer Architecture and Parallel Processing"; MGH.
7. David E. Callav & Jaswinder Pal Singh Marge Kaufmann" Advance Computer Architecture", EIS India.
8. Sajjan G. Shiva, Taylor & Francis, "Advance Computer Architecture.

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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			
STCS-610	Hardware and Networking	3(1+0+2)	30	10	10	50	50	150	1 hr	2 hr

Pattern:

Syllabus

Theory:

UNIT-I

Introduction of Computer - History of Computers, Types of Computers, Overview of PC / Block Diagram, Processor Types & Specifications -Buses & its types, Speed Rating & over clocking, Physical packages of Processor , Generation of Processors & comparison, Storage Devices-Floppy Disk Storage , Hard Disk Storage , Optical Storage, Memory-Types of Memory , Memory Modules & its specifications.

UNIT-II

BIOS & Installation-BIOS Basics, CMOS Setup Specification, Installation of Windows, Mother Board Architecture -Form Factors, Various components & its functions, Chipset-functions

UNIT-III

Networking- Basic networking concepts, The OSI model, Network adapters, Introducing protocols, Network cabling and devices, Internetworking components, remote and WAN connectivity, troubleshooting hardware.

UNIT-IV

TCP/IP fundamentals, TCP/IP addressing and subnetting, Name resolution, Firewalls and proxies, Troubleshooting network connectivity, Identifying network operating system features, Network clients, Directory services, Accessing and managing resources in a Windows network.

UNIT-V

Monitoring and troubleshooting a Windows server, Managing and troubleshooting NetWare network resources, Fault tolerance and disaster recovery, Routine maintenance. Troubleshooting. Installing NetWare 6.5.

Practical:

1. To make the comparative study of various motherboards. (Intel 80386, Intel 80486, Pentium Processor, Pentium Pro, Celeron)
2. To study various cables used in computer communication. (Patch Cables , Ethernet Crossover Cables , USB cable , Unshielded Twisted Pair (UTP) Cable, Shielded Twisted Pair (STP) , Coaxial Cable , Fibre Optic Cable)
3. To study various connections and ports used in computer communication. PS/2 port and its

specification, VGA Port and its specification, Serial port and its specification and parallel Ports and its specification, USB Port and its specification

4. To study various cards used in a Computer System. (Ethernet Card, Sound Card, Video/Graphics Card, Network Interface card ,TV Tuner Card, Accelerator card)
- 5 To study rotational and loading mechanisms of the following drives: (Floppy disk drive, Hard disk, CD ROM, CD-R/RW, DVD-ROM, DVD recordable drives_
- 6 To study monitor and its circuitry (CRT (Cathode Ray Tube), LCD (Liquid Crystal Display), LED (Light-Emitting Diodes), Plasma OLED.
7. Microprocessor and controller circuitry of a keyboard: Membrane keyboard. Dome Switch keyboard, Mechanical Switch keyboard, Laser keyboard, Roll-up keyboard
8. To Study parts of Mouse: I. Mechanical mouse II. Trackball mouse III. Optical mouse IV. Infrared mouse V. Stylus mouse

Reference Books:

- 1.Computer networking - By Tanenbaum (Pearson Education)
 - 2.Computer Network - By U.Black
 - 3.Computer Hardware and Networking-by Vishnu P. Singh (Asian Book Publication)
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			Major	Minor	Sessio nal.	End Sem	Lab Work			
STCS-611	My SQL	3(1+0+2)	30	10	10	50	50	150	1 hr	2 hr

Course Objectives:

Syllabus

Theory:

UNIT-I

MySQL Server Files and Scripts,MySQL Programs,MySQL Server,MySQL Client,GUI Tools,MySQL Server Configuration,MySQL Security IssuesSecuring MySQL Against Attacks,Security-Related mysql Options,Security Issues with LOAD DATA LOCAL.

UNIT-II

MySQL Access Privilege System,MySQL Privilege System Overview,Privileges Provided by MySQL,Connecting to the MySQL Server – Stages,Access Control, Connection Verification.

UNIT-III

MySQL User Account Management,Users and Passwords,Creating New Users,Deleting User Accounts,Limiting User Resources,Changing Passwords.MySQL Database Maintenance,Backup and Recovery,Point-in-Time Recovery,Maintenance and Crash Recovery,myisamchk Syntax and Options,Getting Table Information,MySQL Local Setting,National Characters and Sorting,MySQL Server Time Zone.

UNIT-IV

MySQL Log Files,Error Log,General Query Log,Update Log,Binary Log,Slow Query Log,Log File Maintenance and Rotation.

UNIT-V

Running Multiple Servers in Unix and Linux,Using Client Tools in a Multi-Server Environment MySQL Query Cache,The Concept of Query Cache,Testing Query Cache with SELECT,Configuring Query Cache,Checking Query Cache Status and Maintenance.

Practical:

- 1.To study MySQL Access Privilege System.
2. Connecting to the MySQL Server.
3. Exercise on Different type of query.
4. MySQL table schema - how to show the schema of a MySQL table.
5. A MySQL add user and GRANT example
6. MySQL show tables - How do I list the tables in a MySQL database?

7. How to use the fields or schema of a database table?
8. Running Multiple MySQL Servers on the Same Machine.
9. Running Multiple Servers in Windows as Services.

Reference Books:

1. MySQL: The Complete Reference-Vikram Vaswani, McGraw Hill Professional
 2. MySQL –Paul Dubois Publisher: Pearson Education
 3. Learning MySQL -Seyed Tahaghoghi, Hugh Williams.
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			Major	Minor	Sessional.	End Sem	Lab Work			
STCS-612	JSP	3(1+0+2)	30	10	10	50	50	150	1 hr	2 hr

Pattern:

Course objectives:

This course will try to provide advance knowledge on java script programming. It provides knowledge to develop the website script programming.

Syllabus

Theory:

UNIT-I

INTRODUCTION OF JSP-Life cycle of a JSP Page,The JSP API,JSP in Eclipse, JSP scripting elements -JSP Scriptlet tag,JSP expression tag,JSP Declaration Tag.

UNIT-II

JSP implicit objects-JSP Request,JSP Response,JSP Config,JSP Application,JSP Session,JSP PageContext,JSP Page,JSP Exception.

UNIT-III

JSP directives-JSP Page Directive,JSP Include Directive,JSP Taglib Directive,Exceptional handling in JSP,JSP action tags-jsp:forward, jsp:includejsp: useBean,jsp:setProperty,jsp: getProperty.

UNIT-IV

Expression language,MVC in JSP,JSTL,JSP custom tags.

UNIT-V

Practise problem in JSP-Registration Form, Login Form, Uploading File,Downloading File.

Course outcomes:

Students able to develop own websites.

Students able to understand client server programming.

Practical:

1. Create a JSP program which displays current date and time. The time should be displayed like a live watch.(this may not work in IE , so try any other browser).
2. Create a class called customer(customer.java) with (customer first name & last name(private data item) with set & get methods for data items. In another JSP page import this bean using import tag & create object of the customer & display the name on screen.
3. Create an HTML page for login form using form tag.(first Name, Lastname). On clicking on the submit button the JSP page displays the firstname & lastname(if the first name and last name is empty then the page should be redirected to login form again).
4. Write a JSP page that randomly generate numbers in first visit to the page & repeat displaying

- the same numbers in subsequent visits.(Use Session)
5. Create a bean student with attributes (first name, lastname, age, class). In another jsp page display the bean values using `<jsp:usebean>`
 6. Design an applet & display it on screen using `<jsp:pugin>`, otherwise display a message using `<jsp:fallback>`
 7. Create a tag in jsp (for multiplication) and use the tag in jsp file to use the tag to multiply two numbers.
 8. Create the same tag in (9) number using java. And in Jsp file use this tag to display the multiplication of two numbers.
 9. Display the bank account balance using MVC architecture. the controller servlet reads a customer-ID and passes that to some data –access code that returns a bankcustomer value bean the servlet then stores the bean in the http servlet request object where it will be accessible from destination JSP pages.
 10. Create an application to demonstrate all the core tags available in JSTL.

Reference Books :

1. JSP: The Complete Reference-Phil Hanna
 2. Java Server Programming: Java EE5 Black Book-Kogent solutions
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TBCS - 607	Seminar	1(0+0+1)	-	-	-	-	50	50	-	2 hr

OBJECTIVE OF GD AND SEMINAR :

Is to improve the MASS COMMUNICATION and CONVINCING/ understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

EVALUATION:

Will be done by assigned faculty based on group discussion and power point presentation.

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