

Chhattisgarh Swami Vivekananda Technical University, Bhilai(C.G)

Scheme of Teaching and Examination

B.E. VI Semester Information Technology

S. No	Board of Study	Subject Code	Subject Name	Periods per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory/Practical				
							ESE	CT	TA		
1	Information Technology	333651(33)	Web Application Development	4	1	-	80	20	20	120	5
2	Information Technology	333652(33)	Information Theory & Coding	3	1	-	80	20	20	120	4
3	Information Technology	333653(33)	Software Engineering & Project Management	3	1	-	80	20	20	120	4
4	Information Technology	333654(33)	UNIX & Shell Programming	3	1	-	80	20	20	120	4
5	Information Technology	333655(33)	Computer Graphics & Animation	3	1	-	80	20	20	120	4
6	<i>Refer Table – I</i>		Professional Electives-1	3	1	-	80	20	20	120	4
7	Information Technology	333661(33)	Web Application Development Lab (PHP, MySQL, Ajax)	-	-	3	40	-	20	60	2
8	Information Technology	333662(33)	Software Engineering & Project Management Lab	-	-	3	40	-	20	60	2
9	Information Technology	333663(33)	UNIX & Shell Programming Lab	-	-	3	40	-	20	60	2
10	Information Technology	333664(33)	Computer Graphics & Animation Lab	-	-	3	40	-	20	60	2
11	Management	300665(76)	Managerial Skills	-	-	2	-	-	40	40	1
12	Information Technology	-----	Library	-	-	1	-	-	-	-	-
TOTAL				19	6	15	640	120	240	1000	34

L: Lecture **T:** Tutorial **P:** Practical

ESE: End Semester Examination **CT:** Class Test **TA:** Teachers' Assessment

Note: Industrial Training of eight weeks is mandatory for B.E. students. It is to be completed in two equal parts. The first part must have been completed in summer after IV semester. The second part to be completed during summer after VI semester after which students have to submit a training report which will be evaluated by college teachers during B.E. VII semester.

Table -1: Professional Elective - I

S. N.	Board of Studies	Subject Code	Subject Name
1	Computer Science & Engg	333671(22)	Digital Signal Processing
2	Information Technology	333672(33)	Image Processing
3	Information Technology	333673(33)	Multimedia & Virtual Reality
4	Computer Science & Engg	333674(22)	Inter-Networking with TCP/IP
5	Information Technology	333675(33)	Advanced computer Network
6	Information Technology	333676(33)	Embedded and Real Time Operating Systems
7	Computer Science & Engg	333677(22)	Object Oriented Modeling & Design

Note:

1. 1/4th of total strength of students subject to Minimum Strength of twenty students is required to offer an elective in the college in a particular academic session.
2. Choice of elective course once made for an examination cannot be changed for future examinations.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	VI
Subject:	Web Application Development	Code:	333651(33)
Total Theory Periods:	40	Total Tutorial Periods:	10
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit
ESE Duration:	Three Hours	Maximum Marks in ESE:	80
		Minimum Marks in ESE:	28

Course objectives:

- To understand the working of Web Applications and client side technologies.
- To provide understanding of how XML can be developed and used.
- To understand e-commerce.
- To learn how to host and deploy the web applications on servers.

Course outcomes: After completion of this course students are able to

- Explain the understanding of working of web Applications.
- Explain Architectural Framework for e-commerce.
- Develop Web applications that can be hosted on web servers.

- UNIT I CLIENT SIDE TECHNOLOGIES:** Java Script: Java Script – Java Script Object Model, Variables, Constants, Expressions, Conditions, Relational Operators, Functions: Creation and calling function, function returning values, Objects, Events and Event handlers, Accessing HTML form elements, accessing external java script file. AJAX: What is Ajax, How Ajax works, Synchronous and Asynchronous modes, creating *XMLHttpRequest* Object, Sending a Post and Get Request To a Server using open and send methods, Handling server response using *responseText* and response XML, The *onreadystatechange* Event, passing data to server side scripts: passing data to server with get and post.
- UNIT II SERVER SIDE TECHNOLOGIES:** Introduction to Servlets, Benefits of using Java Servlets, Reading HTTP request headers, Sending data to a client and writing the HTTP response headers. Introduction to JSP, JSP Life Cycle, Basic Scripting elements: scriptlets, declaration, expressions, JSP Architecture, Directives, Implicit objects, request and response, working with cookies, Session management and tracking.
- UNIT III XML:** What is XML – Basic Standards, Schema Standards, Linking & Presentation Standards, Standards that build on XML, Generating XML data, Writing a simple XML File, Creating a Document type definition, Documents & Data ,Defining Attributes & Entities in the DTD, Defining Parameter Entities & conditional Sections, Resolving a naming conflict, Using Namespaces.
- UNIT IV E-COMMERCE AND PAYMENT SYSTEM:** Introduction to e-Commerce, e-Commerce Framework, e-Commerce and Media Convergence, Anatomy of e-Commerce Applications, e-Commerce Consumer Applications, e-Commerce Organization Applications. Architectural Framework for e-Commerce, WWW as the Architecture, Consumer Oriented Applications, Mercantile Process Models. Types of E-Payment Systems, Smart Cards, Credit Card -Based e-payment Systems.
- UNIT V WEBSITE PLANNING & HOSTING:** Introduction, Web Page Lay-Outing, Where To Host Site, Maintenance Of Site, Search Engines and Indexes, Overview of Search Engine Optimization, Introduction To File Transfer Protocol, Types Of FTP Servers (Including Anonymous), FTP Clients Common Command. Telnet Protocol, Telnet Client, Terminal Emulation. Usenet and Internet Relay Chat.

Text Books: -

1. Ajax Bible, Steve Holzner, Wiley, 2007.
2. JavaScript: The Definitive Guide, David Flanagan, O'Reilly Media, 6th Ed.

Reference Books:

1. JavaScript: The Good Parts, Douglas Crockford, 2008.
2. Xml: The Complete Reference, Williamson, 2001.
3. Head First Servlets and JSP, 2nd Edition by Bryan Basham, Kathy Sierra, Bert Bates O'Reilly Media Publishers
4. Frontiers of Electronics of Commerce, Ravi kalakota & Andrew B. Whinston Addison Wesley
5. Advance Java– Gajendra Gupta, firewall Media, Laxmi Publication, 2006.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	VI		
Subject:	Information Theory & Coding	Code:	333652(33)		
Total Theory Periods:	40	Total Tutorial Periods:	10		
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit		
ESE Duration:	Three Hours	Maximum Marks in ESE:	80	Minimum Marks in ESE:	28

Course Objectives:

The main Objective to include this subject in Information Technology discipline is:

- To design and study of the mathematical model of communication systems and their corresponding probabilistic predictions.
- To motivate our students to optimize the bandwidth of communication channel, develop a secure and compact communication model.
- To minimize and control the erroneous condition in communication.
- Able to calculate capacity of Communication Channels.

Course Outcomes:

- Students will be able to acknowledge about the different probability of erroneous condition in communication and how to control it.
- They will learn to optimize the channel bandwidth and different conditions to improve efficiency of the communication system.
- Understand basic concepts of complexity of cryptographic security methods and their practical applications.
- Apply and control specific coding methods and be able to calculate the rate and error probabilities achieved.

UNIT I	INFORMATION THEORY: Uncertainty, Information, Information rate, mutual information; Marginal, conditional and joint Entropies;; Shannon's concept of information; Shannon's measure of information; Model for Communication system; Source coding and line/channel coding; channel mutual information capacity (Bandwidth)
UNIT II	SOURCE CODING: Model for source coding theorem; entropy of binary memory less source and its extension to discrete memory less source, Source with memory and its entropy, Encoding of the source output, source coding theorem, Huffman coding, Shannon-Fano coding, Discrete memory less Channels, Mutual information, Channel Capacity.
UNIT III	CHANNEL CODING: Binary Symmetric Channel, mutual information & its properties, Channel capacity, channel coding theorem and its application to BSC, Shannon's theorem on channel capacity, capacity of a channel of infinite bandwidth, bandwidth - S/N trade off, practical communication systems in light of Shannon's theorem, Fading channel, channels with memory.
UNIT IV	ERROR CONTROL CODING: BLOCK CODES: Types of codes; Error detecting codes, Parity check codes- Single parity codes; Parity check polynomials; error correcting codes, Block codes; Linear block codes, Cyclic codes -Syndrome calculation, Encoder and decoder - CRC ,Hamming codes, Hamming weight, Hamming distance, Minimum distance decoding, Hamming codes, Repetition codes.
UNIT V	ERROR CONTROL CODING: CONVOLUTIONAL CODES: Convolutional codes- Feedforward Convolutional Encoder, Trellis Representation, Viterbi Decoder for convolutional codes, Viterbi Decoder (contd.), Recursive convolutional encoders, Recursive convolutional encoders, Puncturing, Turbo encoders, Turbo Encoders (contd), Turbo Decoders, Free distance of convolutional codes.

Text Books:

1. Communication Systems by R. P. Singh and S. D. Sapre, 2nd Edition TMH.
2. Information Theory, Coding and Cryptography by Ranjan Bose, TMH, 2002.

Reference Books:

1. Elements of Information Theory by Thomas M. Cover, Joy A. John Wiley & Sons, 2nd edition, 2006.
2. John G. Proakis, "Digital Communications", 2nd Edition, McGraw Hill, 1989.
3. Digital Communication by Proakis, TMH

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	VI		
Subject:	Software Engineering & Project Management	Code:	333653(33)		
Total Theory Periods:	40	Total Tutorial Periods:	10		
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit		
ESE Duration:	Three Hours	Maximum Marks in ESE:	80	Minimum Marks in ESE:	28

Course Objectives:

- To study Software Engineering methodology and models and their impact on project management.
- To study case studies on System development and life-cycle management
- To study Project Management Theory (including formulation of goals, quality planning, estimation, risk assessment and management activities)
- To realize methods and techniques for project planning (including milestones and responsibility map)

Course Outcomes: Upon completion of this course students will be able to-

- Account for traditional and modern software development models and their relevance and suitability of different types of development projects, including agile software development.
- Analyze and discuss the different stages and processes in a development course, and discuss challenges related to the different stages.
- Have experience with the project as a work form in theory and practice
- Explain techniques for project management, estimating and risk assessment.

- UNIT I SOFTWARE PROCESS:** Introduction – S/W Engineering Paradigm –Size Factors- life models (water fall, incremental, spiral, WINWIN spiral, RAD, prototyping, object oriented) – system - computer based system life cycle process – development process – system engineering hierarchy, Software Development Managerial Issues.
- UNIT II SOFTWARE REQUIREMENTS:** Functional and non-functional–user–system–requirement engineering process- feasibility studies – requirements – elicitation– validation and management –Major factors that influence software cost, – S/W document. Analysis and modeling – data, functional and behavioral models structured analysis and data dictionary, SCM – Need for SCM – Version control – introduction to SCM process – Software configuration items.
- UNIT III DESIGN CONCEPTS AND PRINCIPLES:** Design process and concepts – modular design – design heuristic – design model and document. Architectural design software architecture data design architectural design transform – user interface design – user interface design principles acquisitions system – monitoring and control system. Design byproducts: - Test Plans, Test Case Design, Milestones, Walkthroughs and Inspections.
- UNIT IV TESTING & MAINTENANCE:** Taxonomy of software testing – Verification and Validation – test activities – types of s/w test – black box testing – testing boundary condition – structural testing –test coverage criteria Based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies –strategic approach and issue – unit testing – integration testing – validation testing – system testing and debugging.
- UNIT V SOFTWARE PROJECT MANAGEMENT:** Measures and measurements – S/W complexity and science measure – size measure –data and logic structure measure information flow measure. Software cost estimation Software Cost Estimation Techniques, Expert Judgment, Delphi cost estimation (Recursive Estimation), The COCOMO Model, Work Breakdown Structures - Defining a Task Network – Scheduling Earned Value Analysis, Error Tracking – Software changes –program evolution dynamics software maintenance –Architectural evolution Taxonomy of CASE tools.

TEXT BOOKS:

1. Software engineering – A practitioner’s Approach, Roger S. Pressman, McGraw-Hill International Edition, 5th edition, 2001
2. Object Oriented Modelling & Design, Remgaugh J. Blaha, M. Premeralant, W. Eddy F. and Lornsen W. (PHI)

REFERENCE BOOKS:

1. Software engineering, Ian Sommerville, Person education Aisa. 6th edition 2000.
2. An Integrated Approach to Software Engineering , Pankaj Jalote, Springer Verlag.
3. Software Engineering – An Engineering Approach, James F. Peters and Witold Pedrycz., John Wiley and Sons. New Delhi. 2000.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	VI		
Subject:	UNIX & Shell programming	Code:	333654(33)		
Total Theory Periods:	40	Total Tutorial Periods:	10		
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit		
ESE Duration:	Three Hours	Maximum Marks in ESE:	80	Minimum Marks in ESE:	28

COURSE OBJECTIVE:

- To familiarize students with the Linux environment.
- To learn the fundamentals of shell scripting/programming .
- To familiarize students with basic Linux shell script programming.

COURSE OUTCOME: Students will be able to Work confidently in Unix/Linux environment.

- UNIT I INTRODUCTION TO UNIX:** Architecture of Unix, Features of Unix , Unix Commands – PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip **UNIX UTILITIES:** Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin. Text processing utilities and backup utilities , detailed commands to be covered are tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio
- UNIT II INTRODUCTION TO SHELLS:** Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, -Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization. **FILTERS:** Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count Characters, Words or Lines, Comparing Files.
- UNIT III GREP:** Operation, grep Family, Searching for File Content. **SED:** Scripts, Operation, Addresses, commands, Applications, grep and sed. **AWK:** Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep, sed and awk.
- UNIT IV INTERACTIVE KORN SHELL:** Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, Options, Startup Scripts, Command History, Command Execution Process. **KORN SHELL PROGRAMMING:** Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.
- UNIT V INTERACTIVE C SHELL:** C shell features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, On-Off Variables, Startup and Shutdown Scripts, Command History, Command Execution Scripts. **C SHELL PROGRAMMING:** Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples. **FILE MANAGEMENT:** File Structures, System Calls for File Management system, INODES, Structure of Regular File, Directories, Conversions of a Path, name to an INODE, Super Block, INODE Assignment to a New File create, open, close, read, write, lseek, link, symlink unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask.

Text Books:

1. Unix and shell Programming, Behrouz A. Forouzan, Richard F. Gilberg Thomson.
2. Your Unix the ultimate guide, Sumitabha Das, TMH. 2nd Edition.

References:

1. Unix for programmers and users, 3rd edition, Graham Glass, King Ables, Pearson education.
2. Unix programming environment, Kernighan and Pike, PHI. / Pearson Education
3. The Complete Reference Unix, Rosen, Host, Klee, Farber, Rosinski, Second Edition, TMH.
4. Unix Shell programming, Yashwanth Kanitkar, 1st Edition, BPB Publisher

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: Information Technology	Semester: VI
Subject: Computer Graphics & Animation	Code: 333655(33)
Total Theory Periods: 40	Total Tutorial Periods: 10
No. of class Tests to be conducted: 2 (Minimum)	No. of assignments to be submitted: One per Unit
ESE Duration: Three Hours	Maximum Marks in ESE: 80 Minimum Marks in ESE: 28

Course Objectives:

- To provide an understanding of modeling algorithms for basic computer graphic components and acquiring practical knowledge of the same.
- To provide an overview of the key concepts of animation and visual effects with reference to workflow, viewers and technology;
- To provide hands-on experience in the programming 2-D computer animation.

Course Outcomes:

- An ability to apply knowledge of mathematics, science, and engineering to both software and hardware design problems.
- Demonstrating the ability to program animation and interactive projects at a professional level from ground level to finishing stages.
- Students should demonstrate proficiency and competency in advanced 3D modeling and animation software (specifically modeling, rigging, lighting, texturing and animation.).
- Students should be competent in the use of software packages with the ability to translate their artistic skills into any new software they encounter.
- Empowering graduates to make the best moving images work in consonance with good combination of sound, color, perspective, and storytelling into an established graphical context.

- UNIT I Overview Of Graphics System:** I/O devices, Raster scan & Random scan system, line circle generating algorithm: DDA , Bresenham line drawing algorithm, Circle generating algorithm: Midpoint, Bresenham, Mid-point ellipse generating algorithm,, 2-D & 3-D transformation: Translation, Rotation, Scaling, Shearing, Reflection; Solid area filling Algorithm: Boundary, Flood fill algorithm.
- UNIT II Viewing and Clipping:** Windows and Viewport, Viewing transformation; Clipping of 2-D & 3-D Lines: Cyrus Beck, Cohen Sutherland clipping, Polygon clipping: Hodgeman-Sutherland & Weiler-Atherton polygon clipping.
- UNIT III Curves and Surfaces:** Curve representation; Parametric Spline curve; Bezier Curve: parametric continuity(c0, c1, c2), Geometric continuity, Bernstein polynomials, Condition for smooth joining of 2 curve segments, Convex Hull property, B-Spline Curves: Knot vectors (uniform and open uniform curves, non uniform curve), basis function , Subdividing curves, Drawing curves using forward differences.
- UNIT IV Projection, Hidden Surface Elimination and Shading:** Parallel Projection: Orthographic , Axonometric and Oblique Projection; Perspective Projection : Vanishing point, 1,2 & 3 perspective projection; Hidden Surface Elimination: Back Face detection, Z-Buffer Algorithm, Painter Algorithm, Warnock's Algorithm. Illumination model for diffused & Specular reflection, Computing reflection vector, Gouraud and Phong Shading, Texture mapping: characteristics, parametric texture mapping, 2D texture mapping, Bump mapping, Lambert's cosine Law.
- UNIT V Fractals & Animation:** Fractals: self-similar fractals, fractal dimension, Generation of Terrain-random mid-point displacement, Self-squaring fractals. Solid Modelling: Generation through sweep techniques, Constructive solid geometry, B representations, Octrees, Ray Tracing & their Theory, Animation: Procedural animation, Morphing, Motion Control.

Text Books: -

1. Computer graphics, Hearn and Baker, PHI Publication
2. Computer Graphics, Madasu Hanmandlu, PBP Publication, 2005.

Reference Books:-

1. Computer graphics, Peter Shirley, Steve Marscher, Cengage publication, 2009.
2. Computer Graphics, D.A.Godse A.P.Godse, Technical Publications, 2009.
3. Computer Graphics : Multimedia and animation, Malay K. Pakhira . PHI.
4. Computer Graphics, Schoum Series, TMH Publication.
5. Computer Graphics and multimedia, G.S.baluja, Dhanpat Rai Publication

Chhattisgarh Swami Vivekanand Technical University, Bilai

Branch: **Information Technology**

Semester: **VI**

Subject: **Web Application Development Laboratory (PHP, My SQL, Ajax)**

Code: **333661 (33)**

Total Lab Periods: **36**

Batch Size: **30**

Maximum Marks: **40**

Minimum Marks: **20**

Suggested List of Experiments (but should not be limited to):

Client Side Scripting: JavaScript, AJAX:-

1. Introduction to Java Script
2. Java Script Simple Arithmetic
3. Pop-up Box usage
4. Introduction to DOM
5. Inbuilt objects and functions: Date, String, Math, Navigator, window etc.
6. Validations: Name, Pin, E-mail, Mobile No.,
7. Validations using Regular Expressions
8. Introduction to AJAX
9. AJAX for text and xml response.
10. Web and social integration i.e. Facebook widgets, Google widgets, Maps, Picasa Photo albums, You tube video albums, Twitter widgets, etc.

Server side Programming: PHP, J2EE, .Net

1. Introduction and working of server side program execution
2. Data types and Processing
3. Different Tags and Usage
4. Html Form request handling i.e. get and post
5. Login panel working
6. Data base connectivity
7. Session tracking and cookies
8. Dynamic content and page generation
9. Deployment of web application
10. Testing and solution for i.e. SQL Injection, code injection etc.

Books :

1. Ajax Bible-By Steve Holzner, 2007.
2. Head First Servlets and JSP, 2nd Edition by Bryan Basham, Kathy Sierra, Bert Bates,O'Reilly Media Publishers
3. JavaScript Interactive Course – Techmedia
4. Head First PHP & MySQL-Lynn Beighley, Michael Morrison.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**

Semester: **VI**

Subject: **Software Engineering & Project Management
Laboratory**

Code: **333662 (33)**

Total Lab Periods: **36**

Batch Size: **30**

Maximum Marks: **40**

Minimum Marks: **20**

INSTRUCTIONS TO BE STRICTLY FOLLOWED BY STUDENTS:

1. Every two to three students should form a group and should develop software that could be developed during session.
2. Students can opt any Technology/Tool for developing their project
3. The groups should prepare a softcopy as well as hardcopy of the documentation as per phases given below.
4. Every student in the group should have a copy of the documentation
5. Every student should get his own copy of the documentation properly checked from the Teacher In charge, after every phase of development given below.
6. Before the Final Practical examinations, every individual student should submit his own hardcopy of the documentation in a Punched Cardboard File Only.
7. One CD of the project and its documentation (softcopy), from every group should be submitted during final submissions.
8. During Final Submissions, every copy of the documentation should be accompanied by a Submission Certificate duly signed by the Teacher In-charge and Head of Department

Suggested List of Experiments (but should not be limited to):

Experiment.1: Phases in software development project, overview, need, coverage of topics

Procedure:

1. Open an appropriate software engineering guide and study the software development life cycle and related topics.
2. Study the need of the software engineering.
3. Study the coverage of topics such as life cycle models and their comparisons.

Experiment.2: To assign the requirement engineering tasks.

Procedure:

1. Identify the different requirement engineering tasks.
2. Assign these tasks to various students to set the ball rolling.
3. Ask the students to start working on the given tasks.

Experiment.3: To perform the system analysis: Requirement analysis, SRS

Procedure:

1. Assign the group of the student's different tasks of system analysis.
2. Ask students to meet different users and start analysis the requirements.
3. Ask students to give presentations group-wise of their system requirements analysis.

Experiment.4: To perform the function oriented diagram: DFD and Structured chart

Procedure:

1. Identify various processes, data store, input, output etc. of the
2. Use processes at various levels to draw the DFDs.
3. Identify various modules, input, output etc. of the system.
4. Use various modules to draw structured charts.

Experiment.5: To perform the user's view analysis: Use case diagram

Procedure:

1. Identify various processes, use-cases, actors etc. of the
2. Use processes at various levels to draw the use-case diagram.

Experiment.6: To draw the structural view diagram : Class diagram, object diagram

Procedure:

1. Identify various elements such as classes, member variables, member functions etc. of the class diagram
2. Draw the class diagram as per the norms.

3. Identify various elements such as various objects of the object diagram
4. Draw the object diagram as per the norms.

Experiment.7: To draw the behavioral view diagram: Sequence diagram, Collaboration diagram

Procedure:

1. Identify various elements such as controller class, objects, boundaries, messages etc. of the sequence diagram
2. Draw the sequence diagram as per the norms.
3. Identify various elements such as for the sequence diagram of the collaboration diagram
4. Draw the collaboration diagram as per the norms.

Experiment.8: To draw the behavioral view diagram: State-chart diagram, Activity diagram

Procedure:

1. Identify various elements states and their different transition of the state-chart diagram
2. Draw the state-chart diagram as per the norms.
3. Identify various elements such as different activity their boundaries etc. of the activity diagram
4. Draw the activity diagram as per the norms.

Experiment.9: To draw the implementation view diagram: Component diagram.

Procedure:

1. Identify various elements of the component diagram such as the various components like client, server, network elements etc.
2. Draw the component diagram as per the norms.

Experiment.10: To draw the implementation view diagram: deployment diagram

Procedure:

1. Identify various elements such as the hardware components of the deployment diagram
2. Draw the deployment diagram as per the norms.

Experiment.11: To perform various techniques for testing using the testing tool: unit testing, integration testing

Procedure:

1. Identify various modules of the system so that they can be tested stand alone.
2. Identify the groups of the module that can be tested together in integration.
3. Perform the testing of the modules as a unit and in integration by using the testing tool.

Experiment.12: To draw UML diagrams.

Procedure:

1. Identify various elements of the system to be drawn using the IDE.
2. Draw the UML diagram as per the norms

REFERENCE BOOKS:

1. Fundamentals of Software engineering - Rajib Mall, 3rd ed.
2. Software design – From programming to architecture - Eric Braude
3. Object-oriented software engineering – A use case driven approach – Ivar Jacobson(Computer language productivity award winner)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Unix & Shell Programming Laboratory**

Semester: **VI**
Code: **333663 (33)**
Batch Size: **30**
Minimum Marks: **20**

Total Lab Periods: **36**
Maximum Marks: **40**

Note: Use Bash for Shell scripts.

List of Experiment to be performed

- Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
 - Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
- Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
 - Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
- Write a shell script to list all of the directory files in a directory.
 - Write a shell script to find factorial of a given integer.
- Write an awk script to count the number of lines in a file that do not contain vowels.
 - Write an awk script to find the number of characters, words and lines in a file.
- Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
 - Write a c program that makes a copy of a file using standard I/O and system calls.
- Implement in C the following Unix commands using System calls
 - cat, ls, mv
 - Write a C program to emulate the Unix ls -l command.
- Write a program that takes one or more file/directory names as command line input and reports the following information on the file.
 - File type.
 - Number of links.
 - Time of last access.
 - Read, Write and Execute permissions.
- Write a C program to list for every file in a directory, its inode number and file name.
 - Write a C program that demonstrates redirection of standard output to a file. Ex: ls > fl.
- Write a C program to create a child process and allow the parent to display "parent" and the child to display "child" on the screen.
 - Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex:- ls -l | sort
- Write a C program to create a Zombie process.
 - Write a C program that illustrates how an orphan is created.
- Write C programs that illustrate communication between two unrelated processes using named pipe.
 - Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
 - Write a C program (receiver.c) that receives the messages (from the above message queue as specified in (21)) and displays them.
- Write a shell script to accept three numbers and display the largest.
 - Write a shell script to find the number of files in a directory.
 - Write a shell script to display first ten positive numbers using until loop.
- Write a shell script to check if a particular user has logged in or not. If not, continue the loop till he/she logs in. Once the required user logs in, display a message.
 - Write a shell script to accept the name, grade, and basic salary from the user. Write the details into a file called employee, separating the fields with a colon (,) continue the process till the user wants.
- Write a shell script to check whether a file is existing or not.
 - Write a shell script to find the mode of a file in a directory.
 - Write a shell script which will accept different numbers and find their sum.
- Write a menu driven program to display a menu of options and depending upon the user's choice execute the associated command.
 - Write a shell script to calculate the total salary payable to all the employees from the employee file. The salary should be taken from the 8th field of the employee file.
- Write a shell script to copy the source file to the target file.
 - Write a shell script to print the first 10 odd numbers using the while loop.
 - Write a shell script to reverse the digits of a given number.

References:

- Unix Shell programming, Yashwanth Kanitkar, 1st Edition, BPB Publisher
- Unix for programmers and users, 3rd edition, Graham Glass, King Ables, Pearson education.
- Unix programming environment, Kernighan and Pike, PHI. / Pearson Education
- The Complete Reference Unix, Rosen, Host, Klee, Farber, Rosinski, Second Edition, TMH.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Computer Graphics & Animation Laboratory**
Total Lab Periods: **36**
Maximum Marks: **40**

Semester: **VI**
Code: **333664 (33)**
Batch Size: **30**
Minimum Marks: **20**

Suggested List of Experiments (but should not be limited to):

1. To study the different graphics functions supported by C / C++.
2. To practice the following line drawing algorithms:
 - a. Digital differential analyzer (DDA).
 - b. Bresenham's Algorithm.
3. To implement a circle using Midpoint algorithm.
4. To implement an ellipse using Midpoint algorithm.
5. To practice the following 2D transformation operations upon various 2D-polygons:
 - a) Translation.
 - b) Rotation.
 - c) Scaling.
 - d) Reflection.
6. To Practice the following filling (in Raster Graphics Display) upon various 2D-polygons:
 - a) Boundary-fill
 - b) Flood-fill.
7. To implement following line-clipping algorithms upon given line segments:
 - o Cohen-Sutherland's method
 - o Cyrus-Beck's method
8. To implement following polygon clipping algorithms upon various 2D-polygons:
 - o Hodgeman-Sutherland's method
 - o Weiler-Atherton's method
9. To Implement Bezier Curve.
10. To practice simple 2D figures: (smiles / icons / symbols) using graphics functions in 'C'.
11. To practice simple 2D moving objects (wheels / toys) using graphics functions in 'C'.
12. To practice simple 2D rotating objects (umbrella / celestial bodies / beyblades) using graphics functions in 'C'.
13. To practice coloring methods upon various closed polygons / open surfaces (country flags / flowers / toys) using graphics functions in 'C'.
14. To practice making of scenery-designs (houses / gardens / situations) using graphics functions in 'C'.
15. To practice animation techniques upon various moving entities using graphics functions in 'C'.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of Program:	Bachelor of Engineering	Semester:	VI
Branch:	Common to All Branches	Code:	300665 (76)
Subject:	Managerial Skills	Tutorial Period:	NIL
No. of Lectures:	2/Week	Marks in TA:	40
Total Marks in ESE:	NIL	Minimum number of Class Tests to be conducted:	Two

Objective:

The course is introduced to develop managerial skills tremendously and enrich the abilities to enable one to meet the challenges associated with different job levels. Managerial skills are essential for overall professional development of an individual apart from gaining technical knowledge in the subject.

Course Objectives

Upon completion of this course, the student shall be able

- To define and explain the concept of managerial, written and oral communication skill;
- To understand the leadership skill;
- To develop self-appraisal and understand distinction between leader and manager;
- To develop positive attitude and thinking; and
- To understand managerial functions and develop creativity.

UNIT I Managerial Communication Skills: Importance of Business Writing: writing business letters, memorandum, minutes, and reports- informal and formal, legal aspects of business communication, oral communication- presentation, conversation skills, negotiations, and listening skills, how to structure speech and presentation, body language.

UNIT II Managerial skills - Leadership: Characteristics of leader, how to develop leadership; ethics and values of leadership, leaders who make difference, conduct of meetings, small group communications and Brain storming, Decision making, How to make right decision, Conflicts and cooperation, Dissatisfaction: Making them productive.

UNIT III Proactive Manager: How to become the real you: The journey of self-discovery, the path of self-discovery, Assertiveness: A skill to develop, Hero or developer, Difference between manager and leader, Managerial skill check list, team development, How to teach and train, time management, Stress management, Self-assessment.

UNIT IV Attitudinal Change: Concept of attitude through example, benefits of right attitude, how to develop habit of positive thinking, what is fear? How to win it? How to win over failure? How to overcome criticism? How to become real you? How to Motivate? How to build up self confidence?

UNIT V Creativity: Creativity as a managerial skill, Trying to get a grip on creativity. Overview of Management Concepts: Function of Management: Planning, organizing, staffing, controlling.

Course Outcome

- The students will be able to develop formal and informal, negotiation, written and oral communication skill;
- The students will be able to develop manage groups, resolve conflicts and leadership skill and decision making qualities;
- The students will be able to develop self-appraisal, teaching, training and managing stress and time;
- The students will be able develop positive thinking, motivating team members and winning race; and
- The students will be able to develop creativity and fundamental management functions.

Text Books:

1. Basic Managerial Skills for all by E.H. Mc Grawth, Prentice Hall India Pvt Ltd,2006
2. Basic Employability Skills by P. B. Deshmukh, BSP Books Pvt. Ltd., Hyderabad, 2014

Reference Books:

1. How to develop a pleasing personality by Atul John Rego, Better yourself books, Mumbai,2006
2. The powerful Personality by Dr. Ujjawal Patni & Dr. Pratap Deshmukh, Fusion Books, 2006
3. How to Success by Brian Adams, Better Yourself books, Mumbai, 1969

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Digital Signal Processing
(Professional Elective – I)**

Semester: **VI**
Code: **333671(22)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

No. of class Tests to be conducted: **2 (Minimum)**

No. of assignments to be submitted: **One per Unit**

ESE Duration: **Three Hours**

Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objective:

- This course introduces students to the fundamental techniques and applications of digital signal processing
- To develop skills for analyzing and synthesizing algorithms and systems that process discrete time signals, with emphasis on realization and implementation.

Course Outcome:

Upon completion of this course, students will be able to:

- Describe and analyze discrete time signals in the time domain and frequency domain.
- Apply digital signal processing techniques to analyze & design discrete time signals and systems
- Design and apply digital filters

- UNIT I DISCRETE-TIME SIGNALS:** Signal classifications, frequency domain representation, time domain representation, representation of sequences by Fourier transform, properties of Fourier transform, discrete time random signals, and energy and power theorems.
- UNIT II SAMPLING OF TIME SIGNALS:** Sampling theorem, application, frequency domain representation of sampling, and reconstruction of band limited signal from its samples. Discrete time processing of continuous time signals, changing the sampling rate using discrete time processing.
- UNIT III Z-TRANSFORM:** Introduction, properties of the region of convergence, properties of the Z-transform, inversion of the Z-transform, applications of Z-transform.
- UNIT IV BASICS OF DIGITAL FILTERS:** Classification, properties, time invariant system, finite impulse Response (FIR) system, infinite Impulse response (IIR) system. Fundamentals of digital filtering, various types of digital filters, design techniques of digital filters: window technique for FIR, bi-linear transformation and backward difference methods for IIR filter design, analysis of finite word length effects in DSP, DSP algorithm implementation consideration. Applications of DSP.
- UNIT V DISCRETE AND FAST FOURIER TRANSFORM DFT and FFT:** Discrete Fourier transforms properties of DFT, circular convolution, linear convolution using DFT, fast Fourier transform: Radix 2 FFT algorithm, decimation in time, decimation in frequency, bit reversal.

TEXT BOOKS:

1. Digital Signal Processing: Proakis and Manolakis; PHI, 5th Ed.
2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya; TMH

REFERENCE BOOKS:

1. Digital Signal Processing: Alon V. Oppenheim; PHI
2. Digital Signal processing (II-Edition): Mitra, TMH

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Image Processing**
(Professional Elective – I)

Semester: **VI**
Code: **333672(33)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

No. of class Tests to be conducted: **2 (Minimum)**

No. of assignments to be submitted: **One per Unit**

ESE Duration: **Three Hours**

Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objective:

- to explore the basic idea about the pre processing operations for the image processing.
- to motivate our students to understand the different enhancement techniques for image processing.
- to explore the basic idea about the tools for the image processing.
- to motivate our students to understand their role play for the processing of images via communication systems.

Course Outcome:

- Students will be able to acknowledge about the different pre processing steps for image processing.
- Students will be able to acknowledge about the different tools used for image processing.
- Students will be able to understand the basic process of image compression techniques for image processing.
- They may go to choose their carrier in application development for image processing.

- UNIT I INTRODUCTION:** Image formation model, Spatial & Gray level resolution, Image enhancement in special domain: Piecewise transformation functions, Histogram equalization, Histogram specification, image averaging, spatial filters- smoothing and sharpening, Laplacian filter, Canny edge detector.
- UNIT II IMAGE ENHANCEMENT IN FREQUENCY DOMAIN & IMAGE SEGMENTATION:** 2D discrete fourier transform & its inverse, filtering in frequency domain, Ideal & Gaussian low pass filters, High pass filtering, FFT, Line detection, Edge detection, Edge linking & boundary detection, Thresholding, Region based segmentation.
- UNIT III MORPHOLOGICAL IMAGE PROCESSING:** Logic operations involving binary image, Dialation & Erosion, Opening & Closing, Applications to Boundary extraction, region filling, connected component extraction.
- UNIT IV IMAGE COMPRESSION:** Coding redundancy- Huffman coding, LZW coding, run length coding, Lossy compression- DCT, JPEG, MPEG, video compression.
- UNIT V IMAGE REPRESENTATION & 3D:** Boundary descriptors, Shape numbers, Texture, Projective geometry, Correlation based and feature based stereo correspondence, shape from motion, optical flow.

Text Books:

1. Ganzalez and Woods, Digital Image Processing, Pearson education.
2. Sonka and Brooks, Image Processing, TSP ltd,

Reference books:

1. Jain and Rangachar, Machine Vision, MGH.
2. Schalkoff, Digital Image Processing, John Wiley and sons.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Multimedia and Virtual Reality
(Professional Elective – I)**

Semester: **VI**
Code: **333673(33)**

Total Theory Periods: **40**
No. of class Tests to be conducted: **2 (Minimum)**

Total Tutorial Periods: **10**
No. of assignments to be submitted: **One per Unit**

ESE Duration: **Three Hours**

Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course objective:

- To understand the fundamental issues and problems in the representation, manipulation, and delivery of multimedia content particularly in a networked environment.
- To understand the concepts of multimedia components.
- To understand the concepts and application of Virtual Reality System,

Course Outcomes: Upon the completion of the course, the student should be able to:

- Know the fundamental video, audio, image, text processing techniques
- Acquire the basic skill of designing video compression, audio compression, image compression, text compression.
- Know the basic techniques in designing video transmission systems: error control and rate control
- Know the technologies related to virtual reality and application of virtual reality system.
- Familiar with VRML programming.

UNIT I INTRODUCTION: Concept of Multimedia, media & data stream, Main properties of multimedia system, Data stream characteristics of continuous media, multimedia Applications, Hardware and software requirements, Multimedia Products & its evolution.

UNIT II COMPONENTS OF MULTIMEDIA: Text, Basic sound concepts, MIDI, Speech, Basic concept of Images, Graphics format, Overview of image processing, Basic concepts of Video & animation, Conventional system, Transmission, Enhanced system, High Definition system, Computer based animation, Design & authoring Tools, Categories of Authority Tools, Types of products

UNIT III DATA COMPRESSION: Coding requirement, Source, entropy, hybrid coding, JPEG, MPEG, Text compression using static Huffmann technique, Dynamic Huffmann Technique, Statistical coding techniques.

UNIT IV OPTICAL STORAGE MEDIA: Videodisk and other WORMS, Compact Disk digital audio, Advantage of CD-DA Frames tracks blocks of CD-DA, CD-ROM, and Further CD-Rom based developments, Principles of CDWO, Prospects of CD technologies.

UNIT V VIRTUAL REALITY: Introduction to Virtual reality & Virtual reality Systems, Related Technologies: Tele-operation & augmented reality system VRML Programming, Domain Dependent Application like Medical, Visualisation Visibility computation Time Critical rendering.

TEXT BOOKS:

1. Multimedia System Design, Andleigh and Thakarakar , PHI, 2003.
2. Multimedia Technology & Application, David Hillman, Galgotia Publications.

REFERENCE BOOKS:

1. Multimedia Computing Communication and Application, Steinmetz, Pearson Edn.
2. Virtual Reality Systems, John Vince, Pearson Education.
3. Fundamentals of Computer Graphics and Multimedia, D.P. Mukherjee, PHI

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Inter Networking With TCP/IP**
(Professional Elective – I)

Semester: **VI**
Code: **333674(22)**

Total Theory Periods: **40** Total Tutorial Periods: **10**
No. of class Tests to be conducted: **2 (Minimum)** No. of assignments to be submitted: **One per Unit**
ESE Duration: **Three Hours** Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objectives:

- Understand the architecture of the Internet protocols as a layered model.
- Describe the functions implemented by each protocol, the design of the protocol and the characteristics of typical implementations.
- Analyze the relationships and dependencies between the protocols.

Course Outcomes: At the end of this course student will be able to:

- Describe the architecture, design and behaviors of the internet and of the TCP/IP suite of protocols.
- Describe the concepts and techniques that have been used to design and implement the TCP/IP Internet technology
- Describe the issues that are driving the development of new protocols to broaden and enhance the operation of the Internet.

- UNIT I INTRODUCTION:** Introduction to internetworking, Overview of OSI Model TCP/IP protocol suite, Basics of switching technologies and switches, Comparisons of different models, Gateways.
- UNIT II INTERNET PROTOCOL:** Purpose of Internet Protocol, Internet datagram, Options, Checksum, ARP and RARP, Routing Methods: Routing Table and Routing module, ICMP, IGMP. **IP Addresses:** Introduction, Address Classification, A sample internet with classful addressing, Subnetting, Supernetting, Classless addressing, Security at the IP Layer, IPsec, IPv4 and IPv6 packet formats.
- UNIT III ROUTING PROTOCOLS: UNICAST ROUTING PROTOCOLS** Interior and Exterior routing, RIP, OSPF, BGP, **Multicasting:** Introduction, Multicast Routing, Multicast Routing Protocols, Multicast Trees, DVMRP, MOSPF, CBT, PIM, MBONE.
- UNIT IV TRANSPORT CONTROL PROTOCOL: TCP** TCP operation, Segment, Sliding window, Silly window, Options, TCP state machine, Karn's Algorithm, Congestion control- Leaky bucket and Token bucket algorithms. **UDP:** User Datagram, UDP operations, Checksum calculation.
- UNIT V TCP/IP OVER ATM NETWORKS:** ISDN and B-ISDN, ATM reference model, ATM Switch, Interconnection Network, Virtual circuit in ATM, Paths, Circuits and identifiers, ATM cell transport and adaptation layers, packet type and multiplexing, IP Address binding in an ATM Network, Logical Subnet Concept and Connection Management.

Text Books:

1. Internetworking with TCP/IP by Comer (Vol. 1)(PHI Pub.)
2. TCP/IP Protocol suite by Behrouz A. Forouzan.(TMH Pub.)

Reference Books:

1. Computer Networking by James F. Kurose, Keith W. Ross (Pearson Education)
2. TCP/IP Illustrated By Wright and Stevens (Vol.2) (Pearson Education)
3. An Introduction to Computer Networks by Kenneth C. Mansfield Jr. James L. Antonakes (PHI)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Advanced Computer Networks
(Professional Elective – I)**

Semester: **VI**
Code: **333675(33)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

No. of class Tests to be conducted: **2 (Minimum)**

No. of assignments to be submitted: **One per Unit**

ESE Duration: **Three Hours**

Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objective:

- To expose students to the “full span” of the computer network’s frontier
- To encourage a performance perspective towards analysis of computer and communications networks
- The goal of this course is that the student will develop an understanding of the underlying structure of networks and how they operate.

Course outcome:

At the end of this course a student should be able to:

- Explain basic networking concepts by studying client/server architecture, network scalability, geographical scope, the Internet, intranets and extranets.
- Describe layered communication, the process of encapsulation, and message routing in network equipped devices using appropriate protocols.
- Design and build an Ethernet network by designing the subnet structure and configuring the routers to service that network.

UNIT I INTRODUCTION AND LAYERED NETWORK ARCHITECTURE: Messages and Switching, Layering, The Physical Layer: Channels and Modems. Error Detection, ARQ: Retransmission Strategies, Framing, Initialization and Disconnect for ARQ Protocols, Point-to-Point Protocols at the Network Layer, The Transport Layer.

UNIT II DELAY MODELS IN DATA NETWORKS: Queuing Models: Little’s Theorem. The $M / M / 1$ Queuing System, The $M / M / m$, $M / M / \infty$, $M / M / m / m$, and Other Markov Systems, The $M / M / 1$ System, Priority Queuing, An Upper Bound for the $G / G / 1$ System, The Klein rock Independence Approximation, Time Reversibility- Burke’s Theorem, Networks of Queues-Jackson’s Theorem, Extension of Jackson’s Theorem.

UNIT III MULTI-ACCESS COMMUNICATION: Introduction, Slotted Multi-access and the Aloha System, Splitting Algorithms: Tree Algorithms, First-Come First-Serve Splitting Algorithms, Carrier Sensing, Multi-access Reservations: Local Area Networks: Token Rings, High-Speed Local Area Networks, Packet Radio Networks.

UNIT IV ROUTING IN DATA NETWORKS: Introduction, Main Issues in Routing, Interconnected Network Routing: An Overview, Network Algorithms and shortest Path Routing: The Bellman-Ford algorithm, Bellman’s equation and shortest path construction, Dijkstra’s algorithm, The Floyd-Warshall algorithm. Broadcasting Routing Information: Coping with Link Failures, Flow Models, Optimal Routing, and Topological Design, Characterization of Optimal Routing, Feasible Direction Methods for Optimal Routing.

UNIT V FLOW CONTROL: Introduction, Window Flow Control: Node-by-Node Windows for virtual Circuits, Dynamic Window Size Adjustment. Rate Control Schemes, Rate Adjustment Algorithms, Max-Min Flow Control.

Text Books: -

1. Data Networks, Second Edition, By Bertsekas & Gallager ,(PHI)
2. Data Communication, Computer Networks & Open Systems, Fred Halsall, Pearson Education.

Reference Books: -

1. Data Networks, D.Bertsekas and R. Gailagher, PHI Second Ed.
2. Internetworking with TCP/IP, Vol. 1, D.E. Corner, and Prentice Hall India.
3. Computer Networking with IP, Stalling, Pearson Education.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Embedded & Real Time Operating Systems**
(Professional Elective – I)

Semester: **VI**
Code: **333676(33)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

No. of class Tests to be conducted: **2 (Minimum)**

No. of assignments to be submitted: **One per Unit**

ESE Duration: **Three Hours**

Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objectives:

- to explore the basic idea about the modern hardware design using embedded concept.
- to motivate our students to understand their role play for the system design.
- to take an initiative for the development of dedicated operating system and application program for different system design.
- Summarize special concerns that real-time systems present and how these concerns are addressed.

Course Outcomes: At the end of this course student will be able to:

- Students will be able to acknowledge about the embedded systems concept which is useful to design advance and dedicated systems for different purposes.
- They may go to choose their carrier in application development for these systems.
- Embedded Applications and Design Considerations.
- Envisaging the type of ES and selection of Components, kind of Programming required, Interfaces and inter component communication in real time Systems.

UNIT I INTRODUCTION TO EMBEDDED SYSTEMS: An Embedded System, Processor in the System, Other Hardware Units, Software Embedded in to a System, Exemplary Embedded Systems, Embedded Systems On Chip and in VLSI Circuits. **Processor & Memory Organization:** Structural Units in a Processor, Processor Selection for an Embedded System, Memory Devices, Memory Selection for an Embedded Systems, Direct Memory Access, Interfacing Processor, Memories & I/O Devices.

UNIT II 8051 PROCESSOR: 8051 Processor Architecture And Instruction Set : The CPU, Addressing modes, external addressing, Interrupt handling, Instruction execution, Instruction set – data movement; arithmetic; bit operators; branch, Software development tools like assemblers; simulators; cross-compilers, O/P file formats. Hardware Features : 8051 – Device packaging, Chip technology, Power considerations, Reset, System clock/oscillators, Parallel I/O, Timers, Interrupts, Serial I/O, Control store and External memory devices.

UNIT III SOFTWARE DEVELOPMENT AND TOOLS: Embedded system evolution trends. Round - Robin, robin with Interrupts, function-One-Scheduling Architecture, Algorithms. Introduction to assembler- compiler-cross compilers and Intergrated Development Environment (IDE). Object Oriented Interfacing, Recursion, Debugging strategies, Simulators.

UNIT IV REAL TIME OPERATING SYSTEMS: Task and Task States, tasks and data, semaphores and shared Data Operating system Services-Message queues-Timer Function-Events-Memory Management, Interrupt Routines in an RTOS environment, basic design Using RTOS.

UNIT V DEVELOPMENT AND SUPPORT: Development tools and debugging:- Host and target machines, linker/locators, target system, testing, instruction set, assert macro. Establishing a software development environment C runtime environments Embedded debuggers Cross-development methods embedded file formats, readers Creating object files - the build process loading software into remote targets.

Text Books:-

1. “An Embedded Software Primer” by David E. Simon ISBN 0-201-61569-X
2. Embedded Systems – RajKamal, Tata Mc Graw Hill, India, 2005.

Reference Books:-

1. Real-Time Systems Design and Analysis, Phillip. A. Laplante, second edition, PHI, 2005.
2. Real-Time Systems Development, Rob Williams, Elsevier. 2006.
3. Real - Time Computer Control- An Introduction, Stuart Bennet, 2nd Edn. Pearson Education. 2005.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Object Oriented Modeling & Design**
(Professional Elective – I)

Semester: **VI**
Code: **333677(22)**

Total Theory Periods: **40**
No. of class Tests to be conducted: **2 (Minimum)**

Total Tutorial Periods: **10**
No. of assignments to be submitted: **One per Unit**

ESE Duration: **Three Hours**

Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objective:

- Understand the basic steps of Object Oriented Analysis and Design.
- Gain practical knowledge in the UML diagrams and notations.
- Build an object-oriented model for a project using UML.

Course Outcome:

Upon completion of this course student will be able to-

- Understand basic object-oriented concepts for designing a solution.
- Apply an iterative, use case-driven process to the development of a robust design model.
- Use the UML to represent the design model.
- Apply the OO concepts abstraction, encapsulation, inheritance, hierarchy, modularity, and polymorphism to the development of a robust design model.
- Design a software system using object-oriented software engineering paradigm.

- UNIT I Introduction and Modeling Concepts: Introduction-** What is Object-Orientation?, What is Object-Oriented Development?, Object-Oriented themes, Evidence for usefulness of Object-Oriented Development, OO Modeling history. **Modeling Concepts:** Modeling as design technique- Modeling, Abstraction, The three Models. Class Modeling- Object and Class, Links and Associations Concepts. Generalization and Inheritance, A Sample Class Model, Navigation of Class Models. Advanced Class Modeling –Advanced Objects and Class Concepts, Association ends, N-array associations, Aggregation, Abstract Classes, Multiple Inheritance, Metadata, Reification, Constrains, Derived Data, and Packages.
- UNIT II State Modeling and Interaction Modeling:** State Modeling- Events and States, Transition & Conditions, State diagrams, State diagram behavior, Nested State diagrams, Concurrency. Advanced State Modeling- Nested State diagram, Nested States, Signal Generalization, Concurrency, A Sample State Model, Relation of Class and State Models. Interaction Model- Use Case Models, Sequence Models, Activity Models. Advanced Interaction Modeling- Use Case relationships, Procedural Sequence Models, Special Constructs for activity Models.
- UNIT III Analysis and Design:** Process Overview- Development Stages, Development Life cycle. System Conception- Developing a System concept, Elaborating a Concept, Preparing a Problem statement. Domain Analysis- Overview of Analysis, Domain Class Model, Domain State Model, Domain Interaction Model, Iterating and Analysis. Application Analysis- Application Interaction Model, Application Class Model, Application State Model, Adding Operations.
- UNIT IV System design and class Design: System design:** Overview of System Design, Estimating Performance, Making a Reuse Plan, Breaking a System into Subsystems, Identifying Concurrency, Allocating Subsystems, Management of Data Storage, Handling Global Resources, Choosing Software Control Implementation, Handling Boundary Conditions, Setting Trade-off Priorities, Common Architectural Styles, Architecture of the ATM System.
Class design: Overview of Object Design, Bridging the gap, Realizing Use Cases, Designing Algorithms, Recursing Downward, Refactoring, Design Optimization, Reification of Behavior, Adjustment of Inheritance, Organizing a Class Design, ATM Example
- UNIT V Implementation Modeling-** Overview of Implementation, fine-tuning classes, Fine tuning generalizations, realizing Associations, Testing. OO Languages- Introduction, Abbreviated ATM Model, Implementing Structure, Implementing Functionality. Databases- Introduction, Abbreviated ATM Model, Implementing Structure-basic and advanced, Implementing Structure for the ATM Example, Implementing functionality, OO Databases. Programming Style-OO Style, Reusability, Extensibility, Robustness, Programming in-the-large.

Text Books:

1. Object – Oriented Modeling and Design with UML, Michael R Blaha and James R Rumbaugh, 2nd Edition, Pearson Education, India.
2. Object oriented systems development, Ali Bahrami, McGraw-Hill Higher Education, 1999.

Reference Books:

1. Object Oriented Analysis & Design, Atul Kahate, Tata McGraw-Hill Education
2. Object-Oriented Analysis and Design with Applications, Third Edition, Grady Booch, Robert A. Maksimchuk Michael W. Engle, Bobbi J. Young, Ph.D., Jim Conallen, Kelli A. Houston