

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

## Scheme of Teaching and Examination

### B.E. VI Semester Computer Science & Engineering

Sl. No.	Board of Study	Code No.	Subjects	Period Per Week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory/Practical				
							ESE	CT	TA		
1	Computer Sc. & Engg.	322651(22)	Computer Networks	4	1	-	80	20	20	120	5
2	Computer Sc. & Engg.	322652(22)	Compiler Design	3	1	-	80	20	20	120	4
3	Computer Sc. & Engg.	322653(22)	Enterprise Resource Planning	3	1	-	80	20	20	120	4
4	Computer Sc. & Engg.	322654(22)	Software Engineering & Project Management	3	1	-	80	20	20	120	4
5	Computer Sc. & Engg.	322655(22)	Computer Graphics	3	1	-	80	20	20	120	4
6	<i>Refer Table -1</i>		Professional Elective -I	3	1	-	80	20	20	120	4
7	Computer Sc. & Engg.	322661(22)	Computer Networks Lab	-	-	3	40	-	20	60	2
8	Computer Sc. & Engg.	322662(22)	Software Engineering & Project Management Lab – With Minor Project	-	-	3	40	-	20	60	2
9	Computer Sc. & Engg.	322663(22)	Computer Graphics Lab	-	-	3	40	-	20	60	2
10	Computer Sc. & Engg.	322664(22)	Advanced Java Programming Lab	-	-	3	40	-	20	60	2
11	Management	300665(76)	Managerial Skills	-	-	2	-	-	40	40	1
12	Computer Sc. & Engg.	-----	Library	-	-	1	-	-	-	-	-
<b>TOTAL</b>				<b>19</b>	<b>6</b>	<b>15</b>	<b>640</b>	<b>120</b>	<b>240</b>	<b>1000</b>	<b>34</b>

**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. No.	Board of Studies	Subject Code	Subject Name
1	Computer Science & Engg	322671(22)	Digital Signal Processing
2	Computer Science & Engg	322672(22)	Advanced Microprocessors & Micro Controllers
3	Information Technology	322673(33)	Multimedia & Virtual Reality
4	Computer Science & Engg	322674(22)	Inter-Networking with TCP/IP
5	Computer Science & Engg	322675(22)	Management Information Systems
6	Computer Science & Engg	322676(22)	Advanced Operating System
7	Computer Science & Engg	322677(22)	Advanced Data Base Systems.
8	Computer Science & Engg	322678(22)	Object Oriented Modelling & Design

*Note:* 1/4<sup>th</sup> of total strength of students to minimum of twenty students is required to offer an elective in the college in a particular academic session.

- Choice of elective course once made for an examination cannot be changed in future examinations.

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Branch:	<b>Computer Science &amp; Engineering</b>	Semester:	<b>VI</b>		
Subject:	<b>Computer Networks</b>	Code:	<b>322651(22)</b>		
Total Theory Periods:	<b>40</b>	Total Tutorial Periods:	<b>10</b>		
No. of class Tests to be conducted:	<b>2 (Minimum)</b>	No. of assignments to be submitted:	<b>One per Unit</b>		
ESE Duration:	<b>Three Hours</b>	Maximum Marks in ESE:	<b>80</b>	Minimum Marks in ESE:	<b>28</b>

## COURSE OBJECTIVE:

- Provide students with an enhanced base of knowledge in current and reflective practice necessary to support a career in Computer Networking at advanced professional level.
- Understanding concept of local area networks, their topologies, protocols and applications
- Understanding the different protocols, software, and network architectures.

## COURSE OUTCOME: On completion of this unit the student should be able to:

- describe the basis and structure of an abstract layered Network protocol model
- identify and apply basic theorems and formulae for the information-theoretic basis of communication and the performance of TCP/IP network protocols

**UNIT I Introduction:** OSI, TCP/IP and other networks models, Examples of Networks: Novell Networks, Arpanet, Internet, Network Topologies WAN, LAN, MAN.

**Physical Layer:** Transmission media copper, twisted pair wireless, switching and encoding asynchronous communications; Narrow band, broad band ISDN and ATM.

**UNIT II Data link layer :** Design issues, framing, error detection and correction, CRC, Elementary Protocol-stop and wait, Sliding Window, Slip, Data link layer in HDLC, Internet, ATM. Multiple Access Protocols – Link Layer Addressing – ARP – DHCP – Ethernet – Hubs, Bridges, and Switches. Ring Topology - Physical Ring – Logical Ring.

**Medium Access sub layer:** ALOHA, MAC addresses, Carrier sense multiple accesses. IEEE 802.X Standard Ethernet, wireless LANS. Bridges

**UNIT III Network Layer :** Forwarding and Routing – Network Service Models – Virtual Circuit and Datagram Networks – Router – Internet Protocol (IP) – IPv4 and IPv6 – ICMP – Link State Routing – Distance Vector Routing – Hierarchical Routing – RIP – OSPF – BGP – Broadcast and Multicast Routing – MPLS - Mobile IP – IPsec.

**UNIT IV Transport Layer:** Transport Layer Services – Multiplexing and Demultiplexing – UDP – Reliable Data Transfer – Go-Back-N and Selective Repeat. **Connection-Oriented Transport:** TCP – Segment Structure – RTT estimation – Flow Control – Connection Management – Congestion Control – TCP Delay Modeling – SSL and TLS. **Integrated and Differentiated Services:** Intserv – Diffserv.

**UNIT V Application Layer:** Principles of Network Applications – The Web and HTTP – FTP – Electronic Mail – SMTP – Mail Message Formats and MIME – DNS – Socket Programming with TCP and UDP. **Multimedia Networking:** Internet Telephony – RTP – RTCP – RTSP. **Network Security:** Principles of Cryptography – Firewalls – Application Gateway – Attacks and Countermeasures.

## TEXT BOOKS :

1. Data Communications and Networking – Behrouz A. Forouzan.Third Edition TMH.
2. James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, Third edition, 2006

## REFERENCE BOOKS :

1. Computer Networks — Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI
2. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education
3. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Branch:	<b>Computer Science &amp; Engineering</b>	Semester:	<b>VI</b>		
Subject:	<b>Compiler Design</b>	Code:	<b>322652(22)</b>		
Total Theory Periods:	<b>40</b>	Total Tutorial Periods:	<b>10</b>		
No. of class Tests to be conducted:	<b>2 (Minimum)</b>	No. of assignments to be submitted:	<b>One per Unit</b>		
ESE Duration:	<b>Three Hours</b>	Maximum Marks in ESE:	<b>80</b>	Minimum Marks in ESE:	<b>28</b>

## COURSE OBJECTIVE:

- to understanding the fundamental principles in compiler design
- To provide the skills needed for building compilers for various situations that one may encounter in a career in Computer Science.

## COURSE OUTCOME:

- After the course a student should have an understanding, based on knowledge of the underlying machine architecture, the limitations and efficiency of various design techniques of compilers implementation

- UNIT I INTRODUCTION:** Introduction to Compiler, single and multi-pass compilers, Translators, Phases of Compilers, Compiler writing tools, Bootstrapping, Backpatching. Finite Automata and Lexical Analyzer: Role of Lexical Analyzer, Specification of tokens, Recognition of tokens, Regular expression, Finite automata, from regular expression to finite automata transition diagrams, Implementation of lexical analyzer Tool for lexical analyzer LEX, Error reporting.
- UNIT II SYNTAX ANALYSIS AND PARSING TECHNIQUES:** Context free grammars, Bottom-up parsing and top down parsing. Top down Parsing : elimination of left recursion, recursive descent parsing, Predicative Parsing ,Bottom Up Parsing : Operator precedence parsing, LR parsers, Construction of SLR, canonical LR and LALR parsing tables, Construction of SLR parse tables for Ambiguous grammar, the parser generator – YACC, error recovery in top down and bottom up parsing.
- UNIT III SYNTAX DIRECTED TRANSLATION & INTERMEDIATE CODE GENERATION :** Synthesized and inherited attributes, dependency graph, Construction of syntax trees, bottom up and top down evaluation of attributes, S-attributed and L-attributed definitions ,Postfix notation; Three address codes, quadruples, triples and indirect triples, Translation of assignment statements, control flow, Boolean expression and Procedure Calls.
- UNIT IV RUNTIME ENVIRONMENT:** Storage organization, activation trees, activation records, allocation strategies, Parameter passing symbol table, dynamic storage allocation.
- UNIT V CODE OPTIMIZATION & CODE GENERATION:** Basic blocks and flow graphs, Optimization of basic blocks, Loop optimization, Global data flow analysis, Loop invariant computations. Issue in the design of Code generator, register allocation, the target machine, and simple Code generator.

## Text Books:

1. Compilers-Principles, Techniques and Tools, Alfred V. Aho, Ravi Sethi and Ullman J.D., Addison Wesley, 2<sup>nd</sup> Ed.
2. Principle of Compiler Design, Alfred V. Aho, and J.D. Ullman, Narosa Publication.

## Reference Books:

1. Compiler design in C, A.C. Holub, PHI.
2. Compiler construction (Theory and Practice), A.Barret William and R.M. Bates, Galgotia Publication.
3. Compiler Design, Kakde.

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	<b>Computer Science &amp; Engineering</b>	Semester:	<b>VI</b>		
Subject:	<b>Enterprise Resource Planning</b>	Code:	<b>322653(22)</b>		
Total Theory Periods:	<b>40</b>	Total Tutorial Periods:	<b>10</b>		
No. of class Tests to be conducted:	<b>2 (Minimum)</b>	No. of assignments to be submitted:	<b>One per Unit</b>		
ESE Duration:	<b>Three Hours</b>	Maximum Marks in ESE:	<b>80</b>	Minimum Marks in ESE:	<b>28</b>

## COURSE OBJECTIVES:

- To know the basics of ERP and business modules of ERP
- To understand the key implementation issues of ERP
- To be aware of some popular products in the area of ERP
- To appreciate the current and future trends in ERP

**COURSE OUTCOME:** Students will know the strategic importance of Enterprise Resource Planning.

**UNIT I INTRODUCTION:** ERP: An Overview, Enterprise – An Overview, Origin, Evolution and Structure: Conceptual Model of ERP, The Benefits of ERP, ERP and Related Technologies, Business Process Reengineering (BPR), Data Warehousing, Data Mining, OLAP, Product Life Cycle Management(PLM), Supply chain Management(SCM)

**UNIT II ERP IMPLEMENTATION:** ERP Implementation Lifecycle, Implementation Methodology, Hidden Costs, Organizing the Implementation, Role of SDLC/SSAD, Object Oriented Architecture Vendors, Consultants and Users, Contracts with Vendors, Consultants and Employees, Project Management and Monitoring

**UNIT III THE BUSINESS MODULES:** Business modules in an ERP Package, Finance, Manufacturing, Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution

**UNIT IV THE ERP MARKET:** ERP Marketplace and Marketplace Dynamics: Market Overview, Marketplace Dynamics, The Changing ERP Market. ERP- Functional Modules: Introduction, Functional Modules of ERP Software, Integration of ERP, Supply chain and Customer Relationship Applications

**UNIT V ERP – PRESENT AND FUTURE:**ERP, ERP and Internet, Critical success and failure factors, Integrating ERP into organizational culture Using ERP tool: ERP Market Place, SAP AG, PeopleSoft, Baan, JD Edwards, Oracle, QAD, SSA. Turbo Charge the ERP System, EIA, ERP and e-Commerce, ERP and Internet, Future Directions

## TEXT BOOK:

1. Alexis Leon, “ERP Demystified”, Tata McGraw Hill, New Delhi, 2000

## REFERENCE BOOKS:

1. Joseph A Brady, Ellen F Monk, Bret Wagner, “Concepts in Enterprise Resource Planning”, Thompson Course Technology, USA, 2001.
2. Vinod Kumar Garg and Venkitakrishnan N K, “Enterprise Resource Planning – Concepts and Practice”, PHI, New Delhi, 2003

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	<b>Computer Science &amp; Engineering</b>	Semester:	<b>VI</b>		
Subject:	<b>Software Engineering &amp; Project Management</b>	Code:	<b>322654(22)</b>		
Total Theory Periods:	<b>40</b>	Total Tutorial Periods:	<b>10</b>		
No. of class Tests to be conducted:	<b>2 (Minimum)</b>	No. of assignments to be submitted:	<b>One per Unit</b>		
ESE Duration:	<b>Three Hours</b>	Maximum Marks in ESE:	<b>80</b>	Minimum Marks in ESE:	<b>28</b>

## COURSE OBJECTIVE:

- To introduce software project and to understand about the different software processes & their uses.
- Understanding good coding practices, including documentation, contracts, regression tests and daily builds.
- To introduce ethical and professional issues and to explain why they are concern to software engineers.
- To understand how Software engineering & Project Management is concerned with theories, methods and tools for professional software development.

## COURSE OUTCOME:

- After completion of this course, the students would be able to
- Select and implement different software development process models
  - Extracting and analyzing software requirements specifications for different projects
  - Developing some basic level of software architecture/design
  - Applying standard coding practices, Identification and implementation of the software metrics
  - Defining the basic concepts and importance of Software project management concepts like cost estimation, scheduling and reviewing the progress.
  - Applying different testing and debugging techniques and analyzing their effectiveness.
  - Analyzing software risks and risk management strategies
  - Defining the concepts of software quality and reliability on the basis of International quality standards.

- UNIT I Introduction to Software Engineering:** The evolving role of software, Changing Nature of Software, legacy software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models. Process models: The waterfall model, Incremental process models, Evolutionary process models, specialized process models, The Unified process.
- UNIT II Software Requirements Specification (SRS):** Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document. Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System models: Context Models, behavioural models, Data models, Object models, structured methods.
- UNIT III Software Design:** Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design. Software Measurement and Metrics: Various Size Oriented Measures: Hallstead's Software Science, Function Point (FP) Based Measures, Cyclomatic Complexity Measures: Control Flow Graphs.
- UNIT IV Testing Strategies:** A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging. Product metrics: Software Quality, Frame work for Product metrics, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance. Metrics for Process and Products: Software Measurement, Metrics for software quality.
- UNIT V Software Project Management:** People – Product-Process-Project. Project scheduling and tracking: Basic concepts-relation between people and effort-defining task set for the software project-selecting software engineering task. Computer aided software engineering tools - CASE building blocks, taxonomy of CASE tools, integrated CASE environment.**Software Risk management:** Reactive vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan. Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

## TEXT BOOKS:

1. Software Engineering: A practitioner's Approach, Roger S Pressman, sixth edition. McGrawHill International Edition, 2005
2. Software Engineering, Ian Sommerville, seventh edition, Pearson education,2004

## REFERENCE BOOKS:

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
3. Fundamentals of Software Engineering, Rajib Mall, PHI, 2005
4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Branch:	<b>Computer Science &amp; Engineering</b>	Semester:	<b>VI</b>		
Subject:	<b>Computer Graphics</b>	Code:	<b>322655(22)</b>		
Total Theory Periods:	<b>40</b>	Total Tutorial Periods:	<b>10</b>		
No. of class Tests to be conducted:	<b>2 (Minimum)</b>	No. of assignments to be submitted:	<b>One per Unit</b>		
ESE Duration:	<b>Three Hours</b>	Maximum Marks in ESE:	<b>80</b>	Minimum Marks in ESE:	<b>28</b>

**COURSE OBJECTIVE:** The primary objective of this course is to learn the basic principles of computer graphics. These topics will include the following:

- Transformational geometry -- utilizing transforms to positioning and manipulate objects in 3-dimensional space. This includes the positioning of virtual cameras and light sources.
- Rendering of complex models -- accurately drawing illustrations of complex objects with arbitrary camera and light source. Curves and surfaces -- methods for rendering and shading curved objects

## COURSE OUTCOME:

- Know and be able to describe the general software architecture of programs that use 3D computer graphics.
- Know and be able to discuss hardware system architecture for computer graphics. This includes, but is not limited to: graphics pipeline, frame buffers, and graphic accelerators/co-processors.
- Know and be able to use a current 3D graphics API (e.g., OpenGL or DirectX).
- Must be able to use the underlying algorithms, mathematical concepts, supporting computer graphics.

- UNIT I** Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices
- UNIT II** **Output primitives** : Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms
- UNIT III** **2-D geometrical transforms:** Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. **2-D viewing** : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.
- UNIT IV** **3-D object representation** : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods. **3-D Geometric transformations:** Translation, rotation, scaling, reflection and shear transformations, composite transformations. **3-D viewing:** Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.
- UNIT V** **Visible surface detection methods** : Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods. **Computer animation:** Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

## TEXT BOOKS:

1. "Computer Graphics *C version*", Donald Hearn and M.Pauline Baker, Pearson Education.
2. "Computer Graphics Principles & practice", second edition in C, Foley, Van Dam, Feiner and Hughes, Pearson Education.

## REFERENCE BOOKS:

1. "Computer Graphics", second Edition, Donald Hearn and M.Pauline Baker, PHI/Pearson Education.
2. "Computer Graphics Second edition", Zhig and Xiang, Roy Plastock, Schaum's outlines, Tata Mc- Graw hill edition.
3. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
4. "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Computer Science & Engineering**  
Subject: **Computer Networks Laboratory**  
Total Lab Periods: **36**  
Maximum Marks: **40**

Semester: **VI**  
Code: **322661(22)**  
Batch Size: **30**  
Minimum Marks: **20**

## List of experiments to be conducted in Computer Network Lab.

1. Introduction to Local Area Network with its cables, connectors and topologies.
2. Installation of Switch. Hub their cascading and network mapping.
3. Installation of UTP, Co-axial cable, Cross cable, parallel cable NIC and LAN card.
4. Case Study of Ethernet (10 base 5,10 base 2,10 base T)
5. Installation and working of Net meeting and Remote Desktop.
6. Installation and working with Telnet (Terminal Network).
7. Installation and working with FTP (File Transfer Protocol).
8. Installation and Computers via serial or Parallel ports and enable the computers to share disk and printer port.
9. To connect two Personal Computer with Telephone line.
10. Installation of Modem and Proxy Server.
11. Working with Null Modem.
12. Installation of Windows 2003 server/ Windows 200 server.
13. Configuration of DHCP.
14. Introduction to Server administration.

## Recommended Books.

1. Computer Network and internet by Douglas E. Comer (Pearson Education)
2. List of Software required :-
3. Windows 2003 server/Windows 2000 server.
4. List of Hardware required :-
5. LAN Trainer Kit LAN Card Cable, Connectors, HUB, Switch, Crimping Tools.

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Computer Science & Engineering**  
 Subject: **Software Engineering & Project Management**  
**Laboratory with Minor Project**

Semester: **VI**  
 Code: **322662(22)**

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

Batch Size: **30**  
 Minimum Marks: **20**

## INSTRUCTIONS TO BE STRICTLY FOLLOWED BY STUDENTS

- 1) A group of two to three students should develop software that could be developed during session.
- 2) Technology/Tool like (C/C++/VB/Gambas/PHP/Core Java/Servlet/ JSP .... Any other relevant tool) can be selected for Developing their project
- 3) Phase wise documentation of the project should be submitted (soft and hard copy).
- 4) All group members must have a copy of the documentation, which are to be checked by faculty Lab Incharge, phase wise.
- 5) Before the Final Practical examinations, every individual student should submit his own hardcopy of the documentation in a Punched Cardboard File Only, with a CD containing the softcopy of the same.
- 6) 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

**Note:**

Initial 4 – 6 Weeks Instructor is supposed to teach/Cover PHP/MySQL or students are supposed to go through the spoken Tutorial Course on PHP

### SAMPLE EXPERIMENT

**AIM:** To perform the user’s view analysis: Use case diagram for the coffee-maker.

The CSE Dep’t has a new building in **CSV TU Campus**. We all know that Computer Engineers love caffeine, so the CSE department is planning on installing a Coffeemaker in a lounge across the hall from the 24-hour computer lab. Our job is to test and model the functionality of the Coffeemaker. We are only working with the logic code behind the hardware, so only a command line interface is used for manual testing. Here is a partial listing of requirements for the Coffeemaker system.

**2 TOOLS/APPARATUS:** Net beans 6.0, Microsoft Visio.

**3 STANDARD PROCEDURES:**

**3.1 Analyzing the Problem:**

According to the analysis of **nouns** and **verbs** we can have the following actors and use cases for the given system:

Actors ( based on the nouns)	Use-cases(based on the verbs)
User(The person who makes coffee)	Waiting State
	Add a Recipe
	Edit a Recipe
	Delete a Recipe
	Check Inventory
	Add Inventory
	Purchase Beverage

The use-cases based on the requirements stated in the problem are given in the designing part of the solution.

**3.2 Designing the Solution:**

Requirements - User Stories

<b>Title : Waiting State</b>		
<b>AccTest: checkOptions0</b>	<b>Priority: 1</b>	<b>Story Points: 2</b>
When the Coffee Maker is not in use it waits for user input. There are six different options of user input		
<ol style="list-style-type: none"> <li>1) Add a Recipe</li> <li>2) Edit a Recipe</li> </ol>		



3) Delete a Recipe
4) Check Inventory
5) Add Inventory
6) Purchase Beverage

<b>Title : Add a Recipe</b>		
<b>AccTest: addRecipe1</b>	<b>Priority: 1</b>	<b>Story Points: 2</b>
<ul style="list-style-type: none"> <li>Only three recipes may be added to the Coffeemaker. A recipe consists of a name. price and units of coffee, units of milk, units of sugar and units of chocolate.</li> <li>Each recipe name must be unique in the recipe list. Price must be handled as an integer.</li> <li>A status message is printed to specify if the recipe was successfully added or not. Upon completion the Coffeemaker is returned to the waiting state</li> </ul>		

<b>Title : Delete a Recipe</b>		
<b>AccTest: Delete Recipe1</b>	<b>Priority: 2</b>	<b>Story Points: 1</b>
<ul style="list-style-type: none"> <li>A recipe may be deleted from the Coffeemaker if it exist in the list of recipes in the coffeemaker</li> <li>The recipes are listed by their name</li> <li>Upon completion a status message is printed and the Coffee Maker is returned to the waiting state</li> </ul>		

<b>Title : Edit a Recipe</b>		
<b>AccTest: editRecipe1</b>	<b>Priority: 2</b>	<b>Story Points: 1</b>
<ul style="list-style-type: none"> <li>A recipe may be edited in the Coffeemaker if it exist in the list of recipes in the coffeemaker</li> <li>The recipes are listed by their name. After selecting a recipe to edit , the user will then enter the new recipe information</li> <li>A recipe name may not be changed</li> <li>Upon completion a status message is printed and the Coffee Maker is returned to the waiting state</li> </ul>		

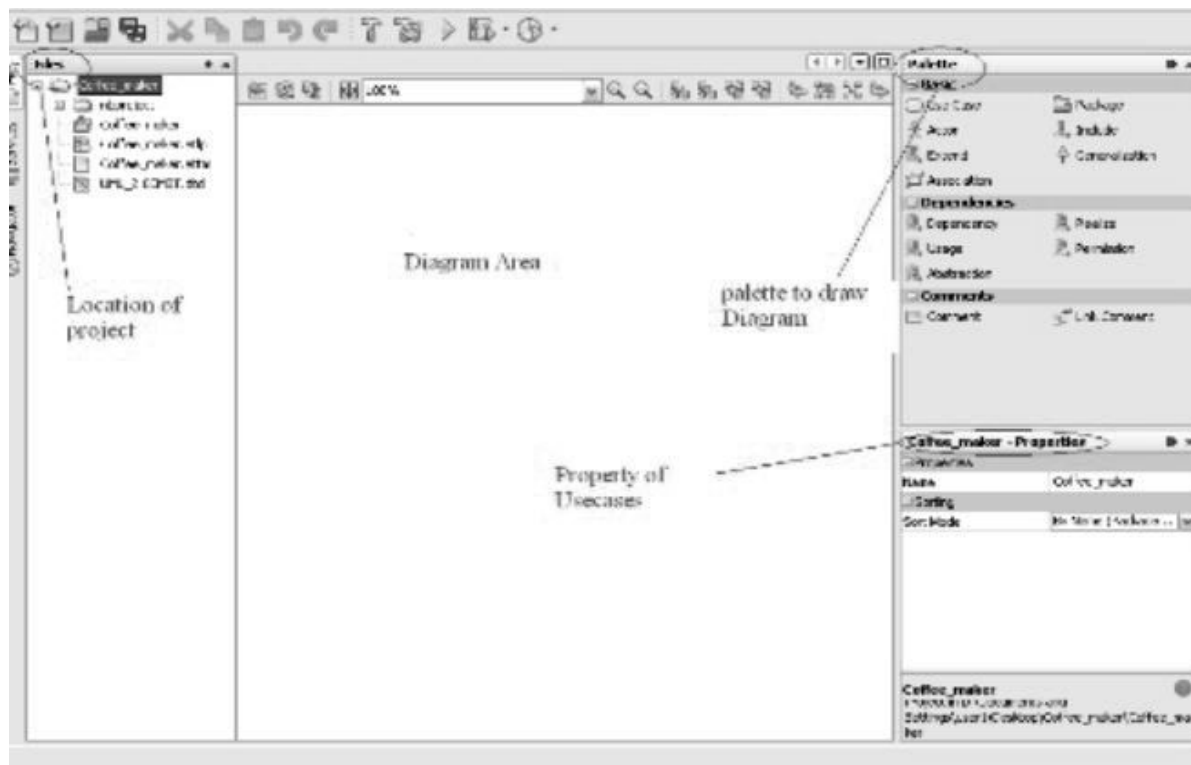
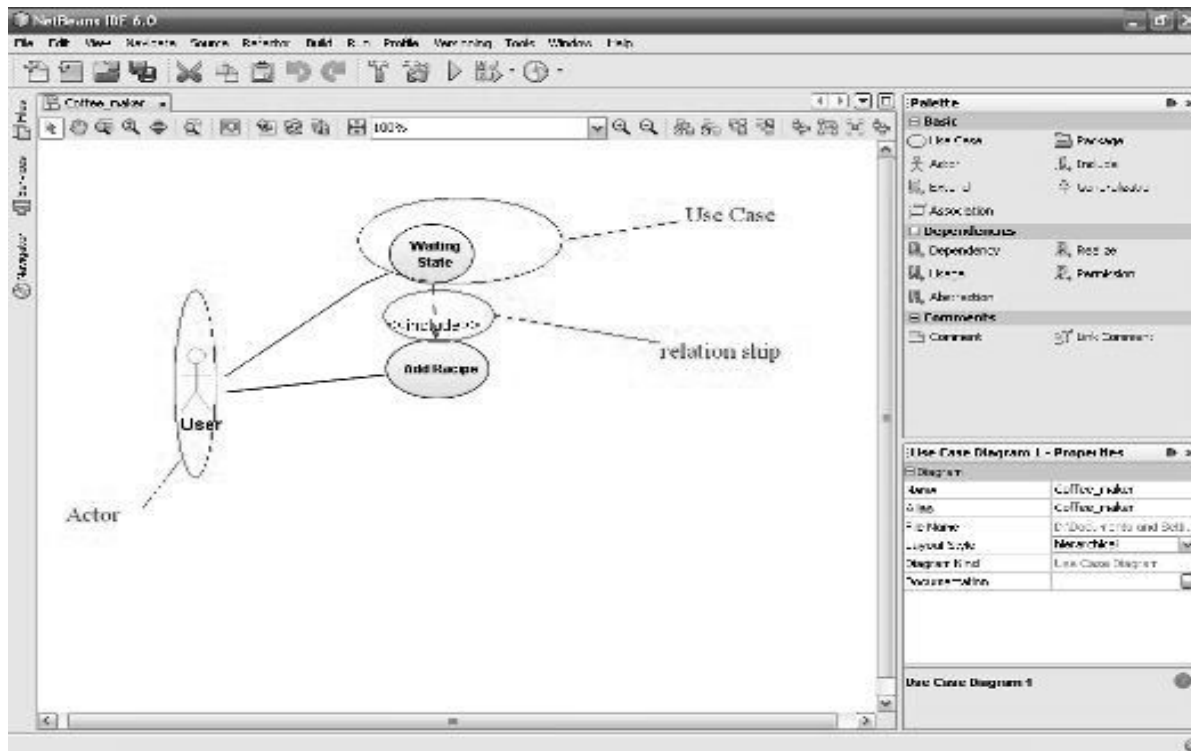
<b>Title : Add Inventory</b>		
<b>AccTest: addInventory1</b>	<b>Priority: 2</b>	<b>Story Points: 2</b>
<ul style="list-style-type: none"> <li>Inventory may be added to the machine at any time from the main menu and is added to the current</li> <li>Inventory in the Coffeemaker</li> <li>The type of Inventory in Coffeemaker are Coffee, milk,sugar and chocolate</li> <li>The Inventory is measured in Integer Units</li> <li>Inventory may be removed from the coffeemaker by purchasing a beverage</li> <li>Upon completion a status message is printed and the Coffeemaker is returned to the waiting state</li> </ul>		

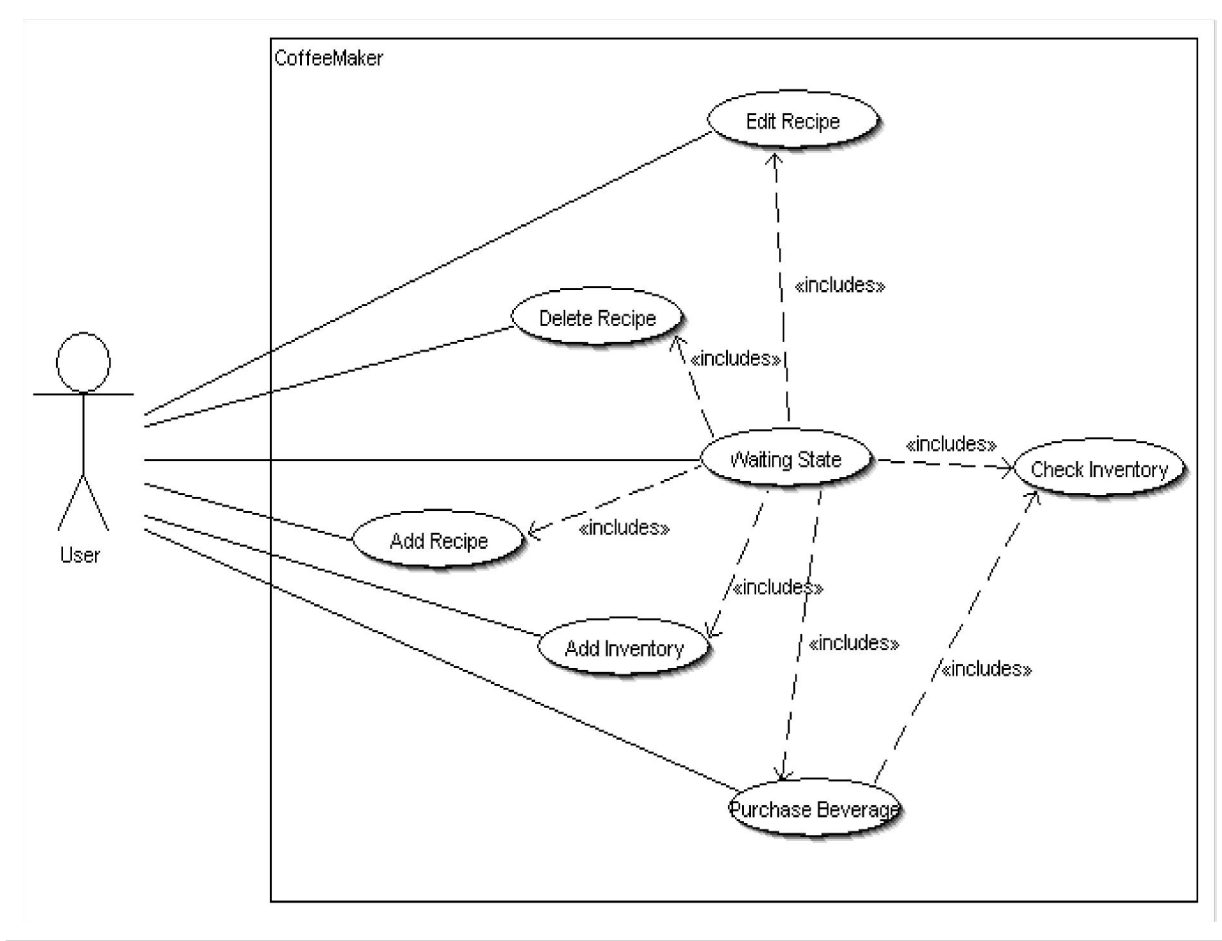
<b>Title : Check Inventory</b>		
<b>AccTest: checkInventory</b>	<b>Priority: 2</b>	<b>Story Points: 1</b>
<ul style="list-style-type: none"> <li>Inventory may be checked at any time from the main menu</li> <li>The units of each item in the inventory are displayed</li> <li>Upon completion the Coffeemaker is returned to the waiting state</li> </ul>		

<b>Title : Purchase Beverage</b>		
<b>AccTest: prurchaseBeverage1</b>	<b>Priority: 1</b>	<b>Story Points: 2</b>
<ul style="list-style-type: none"> <li>The user selects a beverage and inserts an amount of money.</li> <li>The money must be an integer</li> <li>If the beverage is in the RecipeBook and the user paid enough money the beverage will be dispensed and any change will be returned.</li> <li>The user will not be able to purchase a beverage if they do not deposit enough money into the coffeemaker</li> <li>A users money will be returned if there is not enough inventories to make the beverage</li> <li>Upon completion, the Coffee maker displays a message about the purchase status and is returned to the main menu</li> </ul>		

### 3.3 Implementing the Solution

The use-case diagram can be drawn using the netbeans version 6.0 or higher





Requirements – Use Cases

### 3.4 Testing the Solution

Here the problem statement is: CSE department is planning on installing a Coffeemaker in a lounge across the hall from the 24-hour computer lab so we have prepared the use-case accordingly:

The use-cases are tested to match up with the requirements stated in the above table and they are complying with the problem statement requirements.

Requirements given in the problem statement(based on the verbs)	Use-cases(based on the verbs)
When the coffee Maker is not in use it waits for user input. There are six different options of user input	Waiting state
Only three recipes may be added to the Coffeemaker. A Recipe consists of a name. Price, and units of coffee, units of milk , units of sugar and units of chocolate	Add a Recipe
A recipe may be edited in the coffeemaker if it exist in the list of recipes in the Coffeemaker	Edit a Recipe
A recipe may be deleted from the Coffeemaker if it exists in the list of recipes in the Coffeemaker	Delete Recipe
Inventory may be checked at any time from the main menu	Check Inventory
Inventory may be added to the machine at any time from the main menu, and is added to the current inventory in the Coffeemaker	Add Inventory
The user selects a beverage and inserts an amount of money. The money must be an integer	Purchase Beverage

### 4 Conclusions

The use-case diagram can provide the user's view for designing of the software product. And it can also be tested by matching up the requirements with the use-cases.

## LIST OF EXPERIMENTS:

**Expt: 1 - Aim:** Phases in software development project, overview, need, coverage of topics

**Tools/ Apparatus:** None.

**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.

**Expt: 2 - Aim:** To assign the requirement engineering tasks.

**Tools/ Apparatus:** None.

**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.

**Expt: 3- Aim:** To perform the system analysis: Requirement analysis, SRS (Allotted Project)

**Tools/ Apparatus:** None.

**Procedure:**

- 1) Assign the group of the students 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.

**Expt: 4- Aim:** To perform the function oriented diagram: DFD and Structured chart

**Tools/Apparatus:** Netbeans 6.0. or IBM Rational Tools

**Procedure:**

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

**Expt: 5- Aim:** To perform the user's view analysis: Use case diagram

**Tools/Apparatus:** Netbeans 6.0.

**Procedure:**

- 1) Identify various processes, use-cases, actors etc. of the system and ask students to analyse.
- 2) Use processes at various levels to draw the use-case diagram.

**Expt: 6- Aim:** To draw the structural view diagram : Class diagram, object diagram

**Tools/Apparatus:** Netbeans 6.0.

**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.

**Expt: 7- Aim:** To draw the behavioral view diagram : Sequence diagram, Collaboration diagram

**Tools/Apparatus:** Netbeans 6.0.

**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.

**Expt: 8- Aim:** To draw the behavioral view diagram : State-chart diagram, Activity diagram

**Tools/Apparatus:** Netbeans 6.0.

**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.

**Expt: 9- Aim:** To draw the implementation view diagram: Component diagram.

**Tools/Apparatus:** Netbeans 6.0.

**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.

**Expt: 10- Aim:** To draw the implementation view diagram: deployment diagram

**Tools/Apparatus:** Netbeans 6.0.

**Procedure:**

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

**Expt: 11- Aim:** To perform various techniques for testing using the testing tool : unit testing, integration testing

**Tools/Apparatus:** Winrunner.

**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.

**Expt: 12- Aim:** Aim: To draw UML diagrams using Rational rose software.

**Tools/Apparatus:** Rational rose software.

**Procedure:**

- 1) Identify various elements of the system to be drawn using the IDE.
- 2) Use the UML options of the rational rose to draw the diagrams from experiment 4 to 10.

**Expt: 13- Aim:** To draw UML diagrams using MS Visio software.

**Tools/Apparatus:** MS Visio software.

**Procedure:**

- 1) Identify various elements of the system to be drawn using the IDE.
- 2) Use the UML options of the MS Visio software to draw the diagram from experiment 4 to 10.

**REFERENCE BOOKS:**

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

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Computer Science & Engineering**  
Subject: **Computer Graphics Laboratory**  
Total Lab Periods: **36**  
Maximum Marks: **40**

Semester: **VI**  
Code: **322663(22)**  
Batch Size: **30**  
Minimum Marks: **20**

## List of Programs:

1. Write a program to draw the line using DDA algorithm.
2. Write a program to draw the line using Bresenham's algorithm.
3. Write a program to draw circle using Bresenham's algorithm.
4. Write a program to draw circle using mid-point algorithm.
5. Write a program to demonstrate draw ellipse using midpoint algorithm.
6. Write a program Rotation of Triangle.
7. Write a program Translation of Line.
8. Write a program to perform scaling of line.
9. Write a program shearing of Rectangle.
10. Write a program to implement boundary –fill algorithm.
11. Write a program to implement flood –fill algorithm.
12. Write a program to implement Bezier curve using four control points.
13. Write a program to implement Cohen Sutherland line clipping algorithm.
14. Write a program to implement Liang Barsky line clipping algorithm.
15. Write a program to implement face of a cartoon.

## Reference Book:

1. Computer Graphics & Multimedia- G. S. Baluja -Dhanpat Rai & CO.
2. Computer Graphics Donald Hearn & M Pauline Baker-Pearson Pvt. Ltd.

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Computer Science & Engineering**  
Subject: **Advanced Java Programming Laboratory**  
Total Lab Periods: **36**  
Maximum Marks: **40**

Semester: **VI**  
Code: **322664(22)**  
Batch Size: **30**  
Minimum Marks: **20**

Examples are compiled and tested in Eclipse/Net Beans IDE 6.0 or higher version with its integrated tomcat/glassfish server. Minimum 12 programs have to be executed.

## EXPERIMENT LIST:

1. a) Program for printing Hello World  
b) Program for Printing System Date & Time JSP/SERVLET:
2. Program: For Telephone Directory  
In this example we will use `getParameter()` method of the request object for processing the telephone number, Here we would accept telephone no. from front end request is get done processed in server side and corresponding telephone no of entered user is displayed on screen as output
3. Write a server side program for Finding Factorial of number.
4. Write a Server side program in JSP/SERVLET for performing Addition of two no accept numbers from client side by using HTML form
5. Write a Server side program in JSP/SERVLET for calculating the simple interest accept the necessary parameters from client side by using HTML form
6. Write a Server side program in JSP/SERVLET for solving Quadratic Equation accept necessary parameters from HTML form
7. Write a Server side program in JSP/SERVLET for Income Tax Calculation
8. Write a Server side program in JSP/SERVLET for Calculation of Sales Commission
9. Program: Write a server side JSP/SERVLET program for checking prime number, accept number from html file handover the no to JSP/Servlet file process it and return the result
10. Install a database (MySQL or Oracle). Create a table which should contain at least the following fields: name, password, email-id, phone number (these should hold the data from the registration form). Practice 'JDBC' connectivity. Write a java program/servlet/JSP/SERVLET to connect to that database and extract data from the tables and display them. Experiment with various SQL queries. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page
11. Write a JSP/SERVLET which does the following job: Insert the details of the 3 or 4 users who register with the web site (Experiment -11) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database
12. Create tables in the database which contain the details of items (books in our case like Book name, Price, Quantity, Amount)) of each category. Modify your catalogue page in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.
13. Telephone Directory Example: With Database Connectivity with searching and sorting facility
14. Sessional and test results of CSVTU students are to be displayed on the web access to the web pages is given only to restricted users/students. Define MS Access database with user profile, accept name and password from web page and match it from database if it matches display the result page, otherwise show the message the permission is denied. Make the provision for changing password too
15. HTTP is a stateless protocol. Session is required to maintain the state. The user may add some items to cart from the catalog page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time(i.e., from different systems in the LAN using the ip-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated (by using the method `session.invalidate()`). Modify your catalogue and cart JSP/SERVLET pages to achieve the above mentioned functionality using sessions.

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

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

## 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: **Computer Science & Engineering**  
Subject: **Digital Signal Processing**  
(Professional Elective – I)

Semester: **VI**  
Code: **322671(22)**

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

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

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
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 (C.G.)

Semester: VI  
Subject: **Advanced Microprocessors & Micro-Controllers**  
Total Theory Periods: **40**  
Total Marks in End Semester Exam: **80**  
ESE Duration: **Three Hours**

Branch: **Computer Sc. & Engg.**  
Code: **322672(22)**  
Total Tutorial Periods: **Nil**  
Class Tests to be conducted: **02**

## Course Objective:

- To understand the architecture 80286, 80386 and 80486 microprocessors.
- To study the architecture of microcontroller 8051.
- To study the instruction set and programming of 8051.
- To understand various interfacing concepts.

## Course Outcome:

- After successful completion of this course students will be able to explain
- The architecture, programming and addressing modes of Intel 86 family processors.
- Various interfacing concepts circuits necessary for various applications.
- Concepts of microcontroller 8051

- UNIT-I** Intel 80286,80386 and 80486 microprocessors- System architecture, Modes- Real mode- Protected mode - Virtual 8086 mode, Segmentation and Paging, Protection schemes, Management of task, Enhanced instructions
- UNIT-II** Intel Pentium processor –System architecture-Branch prediction-Pentium memory management, Pentium Pro –Architecture and Special features, Pentium 4- Architecture-memory system-Hyper Threading Technology.
- UNIT-III** Reduced Instruction Set Computers (RISC)- Instruction execution characteristics, The use of a large register file, Compiler based Register optimization, Reduced Instruction Set Architecture, RISC Pipelining, MIPS R4000, SPARC.
- UNIT-IV** The ARM processors- ARM registers- ARM instructions- Memory access instructions and addressing modes, register move instructions, arithmetic and logic instructions and branch instructions (Programming not required) , CISC vs RISC.
- UNIT-V** 8051 Micro controller hardware- I/O pins, ports and circuits- External memory- Counters and Timers- Serial Data I/O- Interrupts. 8051 instruction set- Addressing modes- Assembly language programming- I/O port programming- Timer and counter programming- Serial communication- Interrupt programming- 8051 Interfacing to LCD, Sensors and Keyboard.

## Text Books:

1. Advanced Microprocessors and Peripherals, 2nd Edn – A.K. Ray, K.M. Bhurchandi, Tat McGraw Hill
2. The 8051 Microcontroller Architecture Programming and Application, 2nd Edn – Kennath J Ayala, Penram International Publishers (India)

## Reference Books:

1. The 8051 Microcontroller and Embedded Systems – Mohammed Ali Mazidi and Jancie Gillispie Mazidi, Pearson Education Asia
2. Computer Organization and Architecture designing for performance, 7th Ed – William Stalling, Pearson Education
3. Computer Organization, 5th Edn – C.Hamacher, Z. Vranesic, S. Zaky, Mc Graw Hill
4. Microprocessors and Interfacing – Douglas V Hal, McGraw Hill.
5. The Intel Microprocessors 8086/88, 80286,80386,80486,Pentium ,Pentium Pro, PentiumII, PentiumIII, Pentium 4
6. Archetecture,Programming and interfacing – Barry.B.Brey, PHI.
7. Microprocessors and Microcontrollers : Architecture, Programming and System Design 8085, 8086, 8051, 8096 K. Kant, PHI.
8. Microprocessor, Microcomputer and Applications, 3rd Edn – A. K. Mukopadhyaya, Narosa.

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Computer Science & Engineering**  
Subject: **Multimedia and Virtual Reality**  
**(Professional Elective – I)**

Semester: **VI**  
Code: **322673(33)**

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

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

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: **Computer Science & Engineering**  
Subject: **Inter-Networking with TCP/IP**  
**(Professional Elective – I)**

Semester: **VI**  
Code: **322674(22)**

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

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

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 behaviours 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: **Computer Science & Engineering**  
Subject: **Management Information Systems**  
(Professional Elective – I)

Semester: **VI**  
Code: **322675(22)**

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

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

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

## Course Objective:

- Understand the importance of determining information system requirements for all management levels by describing the differences between various types of information systems
- Understand how information systems are developed
- Apply critical-thinking skills in identifying information systems problems and investigate existing literature about hardware and software solutions to problems.

## Course Outcome: At the completion of the course student will be able to -

- Describe the advances in networking, data communications and the Internet and how they affect the way business is conducted.
- Identify which information technology tools are used to solve various business problems.
- Display proficiency solving business problems using modern productivity tools (e.g., spreadsheet, database) or creating custom programs.

- UNIT I      MANAGEMENT & ORGANIZATIONAL SUPPORT SYSTEMS FOR DIGITAL FIRM:** Definition of MIS; Systems approach to MIS: Report writing s/w, MIS and Human factor considerations, concept of organizational information sub-system, MIS & problem solving. Case Studies.
- UNIT II      INFORMATION SYSTEMS & BUSINESS STRATEGY:** Information Management. Who are the users? Manager & Systems, Evolution of Computer based information system (CBIS), Model of CBIS. Information services organization : Trend to End-User computing, justifying the CBIS, Achieving the CBIS, Managing the CBIS, Benefits & Challenges of CBIS implementation. Strategic Information System, Business level & Firm level Strategy, Case Studies.
- UNIT III      INFORMATION SYSTEMS IN THE ENTERPRISE:** Systems from Management & Functional perspective & their relationship: Executive Information System, Decision Support System Sales & Marketing Information System, Manufacturing Information System, Human-Resource Information System. Finance & Account Information System. Case Studies.
- UNIT IV      INFORMATION TECHNOLOGY FOR COMPETITIVE ADVANTAGE:** Firm in its environment, What are the information resources ? Who manages the information resources ? Strategic planning for information resources. End-User Computing as a strategic issue, Information resource management concept. Case Studies.
- UNIT V      E-COMMERCE & INTERNATIONAL INFORMATION SYSTEM:** Introduction to E-Commerce, Business Intelligence. E-Commerce strategy, Electronic Data Interchange, E-commerce methodology, E-commerce technology, Business application of the Internet. Electronic Business success strategies. Managing International Information Systems: IIS architecture, Global business drivers , challenges, strategy: divide, conquer, appease, cooptation, business organization, problems in implementing global information systems, Computer crime, ethics & social issues.

## Text Books:

1. MIS A Concise Study, S.A. Kelkar, PHI, 2<sup>nd</sup> Ed.
2. MIS managing the digital firm, Kenneth C. Laudon & Jane P. Laudon (Pearson Education).

## Reference Books :

1. MIS, Suresh K. Basandra (Wheelers)
2. Introduction to computer Information System for Business, Mark G. Simkin, S. Chand & Co., 1996.
3. Analysis & Design of Information Systems, James A. Senn. MCGraw-Hill International.

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Computer Science & Engineering**  
Subject: **Advanced Operating System  
(Professional Elective – I)**

Semester: **VI**  
Code: **322676(22)**

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

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

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

## Course Objectives:

To understand the main concepts of advanced operating systems (parallel processing systems, distributed systems, real time systems, network operating systems, and open source operating systems); Hardware and software features that support these systems.

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

- Outline the potential benefits of distributed systems.
- Describe the internal architecture of Unix operating system.
- Summarize the major security issues associated with distributed systems along with the range of techniques available for increasing system Security.
- Operate different operating system with ease.

- UNIT I    INTRODUCTION TO DISTRIBUTED OPERATING SYSTEM:** What are distributed OS? Examples of distributed OS, Resource sharing, challenges in designing distributed OS. Distributed OS architectures, software layers, Architectural Model. The Operating System Layer, Protection, Processes and Threads, Communication and invocation, Operating System Architecture. Distributed File System : File Service Architecture, Sun Network File System, the Andrew File System, Recent Advances, Name Services : Name services and domain name systems, Directory and discovery services, The Global name service, X .500 directory service.
- UNIT II    SECURITY AND DISTRIBUTED ALGORITHM :** Overview of security techniques, Cryptographic algorithms, digital signatures, Cryptographic pragmatics. Distributed Algorithms: Distributed algorithm design principles and issues such as coordination, agreement. Examine source of difficulties such as timing, interaction models, and failures.
- UNIT III    STRUCTURE OF UNIX OPERATING SYSTEM :** Overview of UNIX, Internal architecture of UNIX, Classification of UNIX command Handling files, Handling directories, File – Memory – I/O – Process management in UNIX, Administration of UNIX system, Shell Programming environment.
- UNIT IV    STRUCTURE OF WINDOWS OPERATING SYSTEM :** Overview of WINDOWS OS, Internal architecture of WINDOWS OS, Classification of WINDOWS OS command, Handling files, Handling directories, File – Memory – I/O – Process management in WINDOWS OS, Administration of WINDOWS OS system, WINDOWS programming environment.
- UNIT V    CASE STUDY OF OPERATING SYSTEMS:** Case Study of Process Management, Memory Management, File Management, I/O Management, System calls for WINDOWS, UNIX, LINUX etc.

## Text Books:

1. Distributed OS, A.S Tanenbaum, PHI.
2. Distributed Operating System By P. K. Singha , IEEE Press
3. Understanding UNIX, K. Srengan, PHI.

## Reference Books:

1. Handbook of WINDOWS OS, IEEE press.
2. Operating System , Milan, TMH.
3. LINUX OS, BPB publication.

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	<b>Computer Science &amp; Engineering</b>	Semester:	<b>VI</b>		
Subject:	<b>Advanced Data Base Systems (Professional Elective – I)</b>	Code:	<b>322677(22)</b>		
Total Theory Periods:	<b>40</b>	Total Tutorial Periods:	<b>10</b>		
No. of class Tests to be conducted:	<b>2 (Minimum)</b>	No. of assignments to be submitted:	<b>One per Unit</b>		
ESE Duration:	<b>Three Hours</b>	Maximum Marks in ESE:	<b>80</b>	Minimum Marks in ESE:	<b>28</b>

## Course Objective

- Introduce basic concepts and major techniques in DBMS implementations. These include concepts and techniques for data storage, query processing, and transaction management.
- Introduce research development ability in databases.

**Course Outcome:** Upon completion of this course, students should be able to:

- Explain in detail DBMS architecture.
- Explain in detail query processing and techniques involved in query optimization.
- Explain the principles of concurrency control and recovery management.
- Explain the Security management in Databases

- UNIT I DISTRIBUTED DATABASE DESIGN:** Design strategies, Distribution design issues, Fragmentation, Allocation, Oracle DDB design, Distributed database system architecture, Date's rule for DDBS.
- UNIT II DATA REPLICATION & QUERY PROCESSING IN DDBS :** Classification of replica control strategies, Consistency & Request ordering, The Gossip Architecture, Process groups & ISIS, Replication in Oracle, Query optimization in Centralized system, Objective of query processing, Query decomposition, Distributed query optimization algorithms, Query optimization in Oracle.
- UNIT III TRANSACTION PROCESSING & RECOVERY:** Centralized & client server architecture, server systems architectures, parallel & distributed systems, distributed data storage, Transaction property, distributed transactions, commit protocols, concurrency control in distributed database, availability ,heterogeneous distributed databases, Distributed deadlock management, recovery concepts, recovery techniques based on deferred update & on immediate update shadow paging, The ARIES Recovery Algorithm, Recovery in multi-database systems, database backup and recovery from catastrophic failures, Reliability concept & measure, Site failure & network partitioning, directory systems, Database recovery in Oracle.
- UNIT IV SECURITY MANAGEMENT & PL/SQL:** Various aspect of database security, Basic model of database access control, TCSEC Policy identification, Security models, Identification-Authentication- Authorization, Statistical databases, Data encryption, Security in Oracle, JDBC, Purpose of PL/SQL, PL/SQL block, structure & type, PL/SQL syntax & programming.
- UNIT V DIFFERENT DATABASES:** Parallel databases: Introduction, I/O parallelism. Interquery-intraquery-intraoperationinteroperation parallelism design of parallel systems.Client/Server DBS, Oracle DBMS, Distributed processing in Oracle, Oracle network protocols, Network administration in Oracle. Theory of OO databases, Multimedia databases, Real time databases.

## Text book:

1. Database system concepts , 4th edition, Silberschatz-Korth-Sudarshan, TMH
2. Fundamentals of database systems 3rd edition, Elmasri & Navathe, Pearson education

## References:-

1. Database concepts & systems ,2nd edition , Ivan Bayross, SPD
2. Database Management System, Rajesh Narang, PHI.
3. An Introduction to database systems, 7th edition, C.J. Date , Pearson education

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	<b>Computer Science &amp; Engineering</b>	Semester:	<b>VI</b>		
Subject:	<b>Object Oriented Modeling &amp; Design (Professional Elective – I)</b>	Code:	<b>322678(22)</b>		
Total Theory Periods:	<b>40</b>	Total Tutorial Periods:	<b>10</b>		
No. of class Tests to be conducted:	<b>2 (Minimum)</b>	No. of assignments to be submitted:	<b>One per Unit</b>		
ESE Duration:	<b>Three Hours</b>	Maximum Marks in ESE:	<b>80</b>	Minimum Marks in ESE:	<b>28</b>

## 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.

<b>UNIT I</b>	<b>Introduction and Modeling Concepts: Introduction-</b> What is Object-Oriented?, What is Object-Oriented Development?, Object-Oriented themes, Evidence for usefulness of Object-Oriented Development, OO Modeling history. <b>Modeling Concepts:</b> 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.
<b>UNIT II</b>	<b>State Modeling and Interaction Modeling:</b> 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.
<b>UNIT III</b>	<b>Analysis and Design:</b> 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.
<b>UNIT IV</b>	<b>System design and class Design: System design:</b> 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. <b>Class design:</b> 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
<b>UNIT V</b>	<b>Implementation:</b> 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, 2<sup>nd</sup> 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