

Chhattisgarh Swami Vivekanand Technical University, Bilai

Scheme of Teaching and Examination

M.Tech. (Computer Science & Engineering)

II Semester

S.N.	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	Computer Sc. & Engg.	522211 (22)	A. I. and Applications	3	1	-	100	20	20	140	4
2	Computer Sc. & Engg.	522212 (22)	Advanced Database Management System	3	1	-	100	20	20	140	4
3	Computer Sc. & Engg.	522213 (22)	Software Engineering Techniques	3	1	-	100	20	20	140	4
4	Computer Sc. & Engg.	522214 (22)	Computer Graphics & Multimedia	3	1	-	100	20	20	140	4
5	Refer Table – II		Elective –II	3	1	-	100	20	20	140	4
6	Computer Sc. & Engg.	522221 (22)	Advanced Database Management System Lab	--	-	3	75		75	150	2
7	Computer Sc. & Engg.	522222 (22)	Computer Graphics & Multimedia Lab	-	-	3	75		75	150	2
TOTAL				15	5	6	650	100	250	1000	24

L-Lecture, T- Tutorial, P - Practical, ESE- End Semester Examination, CT- Class Test, TA- Teacher's Assessment

Note : Duration of all theory papers will be of Three Hours.

Table – II			
Elective –II			
S.No.	Board of Study	Code	Subject
1	Computer Science Engineering	522231 (22)	Neural Networks
2	Computer Science Engineering	522232 (22)	Cryptography & Network Security
3	Computer Science Engineering	522233 (22)	Distributed Computing
4	Computer Science Engineering	522234 (22)	Cellular mobile Communication (Prerequisite Advanced Digital Communication)
5	Computer Science Engineering	522235 (22)	Digital Image Processing (Prerequisite Digital Signal Processing)

Note (1) – 1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a Particular academic session .

Note (2) – Choice of elective course once made for an examination cannot be changed in future examinations.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, Bhilai

Semester: M.E. II Sem.

Subject: A.I. and Applications

Total Theory Periods: 40

Total Marks in end Semester Exam.: 100

Minimum number of class tests to be conducted: 02

Branch: Computer Science Engg.

Code: 522211 (22)

Total Tut Periods: 12

Unit-1

Introduction:

Introduction to intelligent agents

Problem solving:

Solving problems by searching : state space formulation, depth first and breadth first search, iterative deepening

Unit-2

Intelligent search methods:

A* and its memory restricted variants

Production systems:

Design implementation and limitations, case studies

Unit-3

Game Playing:

Minimax, alpha-beta pruning

Knowledge and reasoning:

Propositional and first order logic, semantic networks, building a knowledge base, inference in first order logic, logical reasoning systems

Unit-4

Learning from observations:

Inductive learning, learning decision trees, computational learning theory, Explanation based learning

Unit-5

Applications:

Environmental Science, Robotics, Aerospace, Medical Science etc.

Text/Reference Books:

1. "AI, a modern approach" by Russel and Norvig, Pearson Education
2. "AI" by Rich and Knight, Tata McGraw Hill
3. "Neural Networks in Computer Intelligence" by KM Fu, McGraw Hill

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, Bhilai

Semester: M.E. II Sem.
Subject: Advanced Database Management System
Total Theory Periods: 40
Total Marks in end Semester Exam.: 100
Minimum number of class tests to be conducted: 02

Branch: Computer Science Engg.
Code: 522212 (22)
Total Tut Periods: 12

Unit-I

Relational Databases

Integrity Constraint revisited: Functional, Multivalued and Join Dependency, Template Algebraic, Inclusion and Generalized Functional Dependency, Chase Algorithms
Query Processing and Optimization: Valuation of Relational Operations, Transformation of Relational Expressions, Indexing and Query Optimization, Limitations of Relational Data Model, Null Values and Partial Information.

Unit-II

Deductive Databases

Datalog and Recursion, Evaluation of Datalog program, Recursive queries with negation.

Objected Oriented and Object Relational Databases

Modeling Complex Data Semantics, Specialization, Generalization, Aggregation and Association, Objects, Object Identity, Equality and Object Reference, Architecture of Object Oriented and Object Relational Databases

Case Studies: Gemstone, O₂, Object Store, SQL3, Oracle xxi, DB2

Unit-III

Parallel and Distributed Databases

Distributed Data Storage – Fragmentation & Replication, Location and Fragment Transparency
Distributed Query Processing and Optimization, Distributed Transaction Modeling and concurrency Control, Distributed Deadlock, Commit Protocols, Design of Parallel Databases, Parallel Query Evaluation.

Unit-IV

Advanced Transaction Processing

Nested and Multilevel Transactions, Compensating Transactions and Saga, Long Duration Transactions, Weak Levels of Consistency, Transaction Work Flows, Transaction Processing Monitors.

Unit-V

Active Database and Real Time Databases

Triggers in SQL, Event Constraint and Action : ECA Rules, Query Processing and Concurrency Control, Compensation and Databases Recovery

WEB Database

Accessing Databases through WEB, WEB Servers, XML Databases, Commercial Systems – Oracle xxi, DB2.

Data Warehousing

Data Warehousing Architecture, Multidimensional Data Model, Update Propagation OLAP Queries.

Text Books

1. Elmars, "Fundamentals of Database Systems", 4th Edition, Pearson Education
2. R. Ramakrishnan, "Database Management Systems", 1998, McGraw Hill International Editions

References:

1. Date, "Introduction to Database System", 7th Edition
2. S. Abiteboul, R. Hull and V. Vianu, "Foundations of Databases", 1995, Addison – Wesley Publishing Co., Reading Massachusetts
3. W. Kim, "Modern Database Systems", 1995, ACM Press, Addison – Wesley,
4. D. Maier, "The Theory of Relational Databases", 1993, Computer Science Press, Rokville, Maryland

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, Bhilai

Semester: M.E. II Sem.
Subject: Software Engineering Techniques
Total Theory Periods: 40
Total Marks in end Semester Exam.: 100
Minimum number of class tests to be conducted: 02

Branch: Computer Science Engg.
Code: 522213 (22)
Total Tut Periods: 12

UNIT - I

Introduction to Software Engineering:

Introduction, Total Effort devoted to Software, Distribution of Effort, Project size Categories, Quality and Productivity Factors, Managerial Issues.

Planning a Software Project:

Goals and Requirements, Developing a Solution Strategy, The Phased Life-Cycle Model, Milestones, Documents, and Reviews, The Cost Model, The Prototype Life-Cycle Model, Successive Versions, Planning an Organizational Structure, Planning for Configuration Management and Quality Assurance, Planning for Independent Verification and Validation, Planning Phase-Dependent Tools and Techniques.

UNIT - II

Software Cost Estimation:

Software Cost Factors, Software Cost Estimation Techniques, Expert Judgment, Delphi Cost Estimation, Work Breakdown Structure, Algorithmic Cost Models, Staffing Level Estimation, Estimating Software Maintenance Costs.

Software Requirements Definition:

The Software Requirements Specification, Formal Specification Techniques :
Relational Notations - Implicit Equations/Recurrence Relations/Algebraic Axioms/ Regular Expressions; State-Oriented Notations - Decision Tables/ Event Tables / Transition Tables /Finite-state Mechanisms/Petri Nets.

UNIT - III

Software Design:

Fundamental Design Concepts, Modules and Modularization Criteria, Design Notations, Design Techniques, Detailed Design Considerations, Real-Time and Distributed System Design, Test Plans, Milestones, Walkthroughs, and Inspections, Design Guidelines.

UNIT - IV

Implementation Issues:

Structured Coding Techniques, Coding Style, Standards and Guidelines, Documentation Guidelines.

Modern Programming Language Features:

Type Checking, User Defined Data Types, Data Abstraction, Scoping Rules, Exception Handling.

UNIT - V

Verification and Validation Techniques:

Quality Assurance, Walkthroughs and Inspections, Unit Testing and Debugging, System Testing.

Software Maintenance:

Enhancing Maintainability during Development, Managerial Aspects of Software Maintenance, Configuration Management, Source-Code Metrics.

Text Books:

1. R. Fairley, "Software Engineering Concepts", Tata McGraw Hill, 1997.
2. R. S. Pressman, "Software Engineering – A practitioner's approach", 5th ed., McGraw Hill Int. Ed., 2001.
3. K.K. Aggarwal & Yogesh Singh, "Software Engineering", New Age International, 2001.

References:

1. P. Jalote, "An Integrated approach to Software Engineering", Narosa, 1991.
2. Stephen R. Schach, "Classical & Object Oriented Software Engineering", IRWIN, 1996.
3. James Peter, W Pedrycz, "Software Engineering", John Wiley & Sons
4. Sommerville, "Software Engineering", 6th ed. Pearson Education, 2002.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, Bhilai

Semester: M.E. II Sem.
Subject: Computer Graphics & Multimedia
Total Theory Periods: 40
Total Marks in end Semester Exam.: 100
Minimum number of class tests to be conducted: 02

Branch: Computer Science & Engg.
Code: 522214 (22)
Total Tutorial Periods: 12

Unit-1

Line Drawing and transformation:

Basic raster graphical algorithm for 2D primitives, Line drawing algorithm, 2D and 3D transformation

Clipping:

Window, Viewport, Clipping algorithm,

Unit-2

Curves and Surfaces:

Circle drawing algorithm, Ellipse drawing algorithm, Bezier curve, b-spline curve, surfaces, Solid modeling

Projection:

Parallel projection, Perspective projection, Computation of vanishing point

Visible surface determination:

Z-buffer algorithm, Scan line algorithm, Area subdivision algorithm, Raytracing algorithm

Unit-3

Shading:

Illumination mode, Specular reflection model, Shading models for curve surfaces, Radiosity method, Rendering, Recursive ray tracing, Texture mapping

Unit-4

Animation

3D animation, morphing, simulation of key frames, Procedural animation, Image Transformation – Translation and Rotation, Morphing, Motion Control, Key framing, Spline Driven Animation, Arc length parameterization.

Unit-5

Multimedia

Data Compression requirement, Information Theory based and frequency domain based compression, Basic compression techniques: lossy & lossless compression, Huffman coding, LZW coding, run length coding, DCT, compression of multimedia data.

Text Books:

1. Foley - Computer Graphics Principles & Practice, 2nd ed. Pearson Education.
2. Hearn & Baker - Computer Graphics C version, 2nd ed. Pearson Education.
3. Woo-Open GL Programming Language version 1.2, 3rd edition Pearson Education
4. Hill-Computer Graphics using open GL 2nd edition Pearson Education
5. Prabhat K. Andleigh, Kiran. Thakrar-Multimedia System Design, 3rd edition PHI

References:

1. Roger and Adams - Mathematical Element for Computer Graphics, 2nd ed., Tata McGraw Hill
2. Rogers – Procedural Element for Computer Graphics, 2nd ed., Tata McGraw Hill.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, Bilai

Semester: M.E. II Sem.
Subject: Neural Networks
Total Theory Periods: 40
Total Marks in end Semester Exam.: 100
Minimum number of class tests to be conducted: 02

Branch: Computer Science & Engg.
Code: 522231 (22)
Total Tutorial Periods: 12

Unit-1

Introduction:

History, overview of biological Neuro-System, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms-Supervised, Unsupervised and reinforcement Learning.

Unit-2

Supervised Learning and Neurodynamics:

Perceptron training rules, Delta, Back propagation training algorithm, Hopfield Networks, Associative Memories.

Unit-3

Unsupervised and Hybrid Learning:

Principal Component Analysis, Self-organizing Feature Maps, ART networks, LVQ,

Unit-4

Applications:

Applications of Artificial Neural Networks to Function Approximation, Regression, Classification, Blind Source Separation, Time Series and Forecasting.

Unit-5

Radial-Basis function networks

Radial-Basis function (RBF) networks and their application in function interpolation, approximation and modeling probability distributions.

Recurrent networks

Hopfield networks.

Text Book:

1. Anderson J.A., "An Introduction to Neural Networks", PHI, 1999.

References:

1. Haykin S., "Neural Networks-A Comprehensive Foundations", Prentice -Hall International, New Jersey, 1999.
2. Freeman J.A., D.M. Skapura, "Neural Networks: Algorithms, Applications and Programming Techniques", Addison-Wesley, Reading, Mass, (1992).
3. Golden R.M., "Mathematical Methods for Neural Network Analysis and Design", MIT Press, Cambridge, MA, 1996.
4. Cherkassky V., F. Kulier, "Learning from Data-Concepts, Theory and Methods", John Wiley, New York, 1998.
5. Anderson J.A., E. Rosenfield, "Neurocomputing: Foundatiions of Research, MIT Press, Cambridge, MA, 1988.
6. Kohonen T., "Self-Organizing Maps", 2nd Ed., Springer Verlag, Berlin, 1997.
7. Patterson D.W., "Artificial Neural Networks: Theory and Applications", Prentice Hall, Singapore, 1995.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, Bhilai

Semester: M.E. II Sem.
Subject: **Cryptography & Network Security**
Total Theory Periods: 40
Total Marks in end Semester Exam.: 100
Minimum number of class tests to be conducted: 02

Branch: **Computer Science & Engg.**
Code: **522232 (22)**
Total Tutorial Periods: 12

Unit-1

Foundations of Cryptography and Security :Ciphers and Secret Messages ,Security Attacks and Services , Mathematical Tools for Cryptography ,Substitutions and Permutations ,Modular Arithmetic, Euclid's Algorithm Finite Fields, Polynomial Arithmetic ,Discrete Logarithms

Unit-2

Conventional Symmetric Encryption Algorithms :Theory of Block Cipher Design ,Feistel Cipher Network Structures ,DES and Triple DES Modes of Operation (ECB,CBC, OFB,CFB) ,Strength (or Not) of DES , Modern Symmetric Encryption Algorithms ,IDEA, CAST, Blowfish, Twofish ,RC2, RC5, Rijndael (AES)

Unit-3

Key Distribution

Stream Ciphers and Pseudo Random Numbers :Pseudo random sequences ,Linear Congruential generators ,Cryptographic Generators ,Design of Stream Cipher, One Time Pad , Public Key cryptography .Prime Numbers and Testing for Primality ,Factoring Large Numbers ,RSA, Diffie-Hellman, ElGamal Key Exchange Algorithms ,Public-Key Cryptography Standards

Unit-4

Hashes and Message Digests :Message Authentication ,MD5, SHA, RIPEMD, HMAC , Mid-term Exam , Digital Signatures, Certificates, User Authentication ,Digital Signature Standard (DSS and DSA) .Security Handshake Pitfalls ,Elliptic Curve Cryptosystems , Authentication of Systems ,Kerberos V4 and V5 ,X.509 Authentication Service .

Unit-5

Electronic Mail Security :Pretty Good Privacy (PGP) ,S/MIME, X.400 ,(3/30) IP and Web Security ,IPSec and Virtual Private Networks ,Secure Sockets and Transport Layer (SSL and TLS) ,Electronic Commerce Security .

Text Book:

1. Cryptography and Network Security, William Stallings.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, Bilai

Semester: M.E. II Sem.

Subject: Distributed Computing

Total Theory Periods: 40

Total Marks in end Semester Exam.: 100

Minimum number of class tests to be conducted: 02

Branch: Computer Science & Engg.

Code: 522233 (22)

Total Tutorial Periods: 12

Fundamentals of Distributed Computing:

Architectural models for distributed and mobile computing systems. Basic concepts in distributed computing such as clocks, message ordering, consistent global states, and consensus.

Basic Algorithms in Message:

Passing Systems, Leader Election in Rings, and Mutual Exclusion in Shared Memory, Fault-Tolerant Consensus, Causality and Time. Message Passing: PVM and MPI.

Distributed Operating Systems:

OS and network operating systems, Distributed File systems. Middleware, client/server model for computing, common layer application protocols (RPC, RMI, streams), distributed processes, network naming, distributed synchronization and distributed object-based systems.

Simulation:

A Formal Model for Simulations, Broadcast and Multicast, Distributed Shared Memory, Fault-Tolerant Simulations of Read/Write Objects Simulating Synchrony, Improving the Fault Tolerance of Algorithms, Fault-Tolerant Clock Synchronization.

Distributed Environments:

Current systems and developments (DCE, CORBA, JAVA).

Advanced Topics:

Randomization, Wait-Free Simulations of Arbitrary Objects, Problems Solvable in Asynchronous Systems, Solving Consensus in Eventually Stable Systems, High Performance Computing-HPF, Distributed and mobile multimedia systems. Adaptability in Mobile Computing. Grid Computing and applications. Fault tolerant Computing Systems.

Text /Reference Books:

1. Hagit Attiya, Jennifer Welch, Distributed Computing: Fundamentals, Simulations, and Advanced Topics, 2nd Edition, March 2004
2. Mullendar S. Distributed Systems, 2nd Ed. Addison, Wesley 1994.
3. Tannenbaum, A. Distributed Operating Systems, Prentice Hall 1995.
4. Helal, Abdelsalam A. *et al.* Anytime, Anywhere Computing: Mobile Computing Concepts and Technology, Kluwer Academic Publishers 1999.
5. George Coulouris, Jean Dollimore and Tim Kindberg, Distributed Systems: Concepts and Design *Third Edition* Addison-Wesley, Pearson Education, 2001.
6. Cay S Horstmann and Gary Cornell, Java 2 Vol I and II-Sun Micro Systems-2001

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, Bhilai

Semester: M.E. II Sem.
Subject: Cellular Mobile Communication (Prerequisite
Advanced Digital Communication)

Branch: Computer Science & Engg.
Code: 522234 (22)

Total Theory Periods: 40

Total Tut Periods: 12

Total Marks in end Semester Exam.: 100

Minimum number of class tests to be conducted: 02

Unit-1

Wireless and Mobile Network Architecture:

Principle of Cellular Communication, Overview 1G, 2G, 2.5G and 3G and 4G technologies. GSM Architecture and Mobility management, hand off management, Network signalling. Mobile Computing fundamental challenges, Mobile Devices –PDA and mobile OS, PalmOs, Win CE and Symbian.

Unit-2

Mobile IP Protocol Architecture : Mobile IP and IP v 6 and its application in mobile computing. Cellular Digital Packet Data CDPD, VOIP, GPRS Services, Wireless Local Loop-WLL system.

Unit-3

Wireless Application Protocol (WAP):

The Wireless Application Protocol application environment, wireless application protocol client software, hardware and websites, wireless application protocol gateways, implementing enterprise wireless application protocol strategy,

Unit-4

Wireless Markup Language:

An Introduction to Wireless Technologies, Markup Languages , An Introduction to XML, Fundamentals of WML., Writing and Formatting Text , Navigating Between Cards and Decks, Displaying Images, Tables, Using Variables, Acquiring User Input

Wireless Markup Language Script:

An Introduction to WMLScript, WMLScript Control Structures, Events, Phone.com Extensions, Usability

Unit-5

Application of Mobile computing:

ASP and Dynamic WAP Sites, XML and XSLT, Dynamic WML Generation with ASP and XSLT, Developing WAP Applications using Emulators.

Text/Reference Books:

1. Yi Bing Lin, "Wireless and Mobile Networks Architecture", John Wiley.
2. Wrox "The Beginning WML and WML Script", Wrox Publication
3. Tomasz Imielinski et.al, Mobile Computing, Kluwer Academic Press 1996.
4. Uwe Hansmann, Pervasive Computing Handbook. The Mobile World, IEE publication 2002
5. Jochen Burkhardt, et.al. Pervasive Computing, Technology and Architecture of Mobile Internet Applications, Addison Wesley, 2002

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, Bhilai

Semester: M.E. II Sem.

Subject: Digital Image Processing (Prerequisite Digital Signal Processing)

Total Theory Periods: 40

Total Marks in end Semester Exam.: 100

Minimum number of class tests to be conducted: 02

Branch: Computer Science & Engg.

Code: 522235 (22)

Total Tut Periods: 12

UNIT - I

Digital image representation, elements of digital processing systems, sampling and quantization, simple image model, basic relationship between pixel and image geometry

UNIT - II

image transforms, introduction to Fourier transform, DFT, properties of 2D DFT, FFT, other separable image transform, DCT, DST, Walsh, Harr transforms

UNIT - III

image enhancement: basic gray level transformation, histogram processing using arithmetic and logical operations, spatial filtering, smoothing and sharpening filters, smoothing and sharpening frequency domain filters.

UNIT - IV

Image compression-fundamentals, image compression models, information theory, free compression, lossy compression, image compression standards

UNIT - V

Image segmentation- detection of discontinuities, edge finding and boundary detection, region based segmentation.

representation and description: representation, boundary descriptor, regional descriptor,

Text Books:

1. Digital image processing: r.c. gonzalez, r.e. wooden, 2nd edition Pearson
2. Fundament of DIP, A.K. Jain(PHI).

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, Bhilai

Semester: M.E. II Sem.
 Subject: Advanced Database Management System – Lab
 Total Practical Periods: 40
 Total Marks in end Semester Exam.: 75

Branch: Computer Science & Engg.
 Code: 522221 (22)

Experiment to be performed

1. Introduction to Oracle9i.
2. Introduction to DML commands.
3. Introduction to select command (including sub queries).
4. Consider the following table (ticket_detail table):

Name of field	Datatype
Ticket_no	Number(5)
Name	Varchar2(20)
Sex	Char(5)
Age	Number(3)
Fare	Number(5,2)

Write a PL/SQL block to give the details of passengers from ticket_detail table.

5. Consider the following table(item)

Name of field	Datatype
Order_id	Number(4)
Item_id	Number(4)
Detail_price	Number(5)
Qty	Number(5)
Prod_id	Number(4)

Write a PL/SQL block(using cursor), which will select only those rows where Order_id is zero from the item table.

6. Write a PL/SQL block(using cursor) that will select only those values from the item table where Item_id is 3000 and calculate total to be price*auantity and print the value of the same. If a value is not to be found then an appropriate message should be displayed.)

7. Create a transparent audit system for a table Client_Master . The system must keep track of records that are being deleted or updated. The functionality being when a record is deleted or modified the original record details and the date of operation are stored in table audit_client,then the delete or update is allowed to go through.

Client_master table

Field name	Datatype(size)	Attributes
Client_no	Varchar2(6)	Primary key/first letter must start with 'C'
Name	Varchar2(20)	Not null
Address1	Varchar2(30)	
Address2	Varchar2(30)	
City	Varchar2(15)	
State	Varchar2(15)	
Pincode	Number(6)	
Bal_due	Number(10,2)	

Audit_client table

Field name	Datatype (size)	Attributes
Client_no	Varchar2(6)	
Name	Varchar2(20)	
Bal_due	Number(10,2)	
Operation	Varchar2(8)	
Userid	Varchar2(20)	
Odate	date	

8. Write a PL/SQL code block that will accept

- i) an Account_id, the type of transaction ,the amount involved and whether the amount to be debited to or credited to an account number.
- ii)the balance in accounts table for the corresponding account number is updated.
- iii)before the update is fired, the record is viewed in the 'for update nowait mode' so that a lock can be acquired on the record to be updated and no other user has access to the same record till the transaction is completed.

Field name	Datatype
Account_id	Varchar2(6)
Name	Varchar2(30)
Bal	Number(20)

9. write a procedure to process a select statement to pass values from database columns to the local variables, the columns or expressions must be associated with local variables.

10. Introduction to privileged commands .

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, Bhilai

Semester: M.E. II Sem.
Subject: Computer Graphic Multimedia – Lab
Total Practical Periods: 40
Total Marks in end Semester Exam.: 75

Branch: Computer Science & Engg.
Code: 522222 (22)

Experiment to be performed

1. Write a program for scaling a triangle.
2. Write a program for drawing a smooth shaded rectangle.
3. Write a program for implementing a sphere using lighting model.
4. Write a program for displaying a stroked font.
5. Write a program for texture mapped check board.
6. Write a program for drawing Bezier curve using four control points.
7. Write a program for drawing a shaded Bezier surface using a mesh.
8. Write a program for implementing a transformed cube.
9. Write a program for implementing planetary system.
10. Write a program for implementing a pick square.