PUNE DISTRICT EDUCATION ASSOCIATION'S

MAMASAHEB MOHOL COLLEGE

48/1A, Erandwane, Paud Road, Pune - 411038(Maharashtra) India

DEPARTMENT OF COMPUTER SCIENCE

COURSE OUTCOME

SUBJECT NAME: Applied Algebra **CLASS – SY B.Sc. (COMPUTRE SCIENCE)**

PAPER: -MTC :211 **SEM- 1st**

NAME OF SUBJECT TEACHER:- MS. PRIYANKA JAISWAL

Course outcome:-

A) Relational understanding of mathematical concepts and concerned structures,and should be able to follow the patterns involved, mathematical reasoning.

B) Adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences.

C) Development and to equip them with mathematical modeling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment Enabling students to develop a positive attitude towards mathematics as an interesting

D) Clear conceptGeneral Vector Spaces, Eigen values and Eigen vectors, Linear Transformations ,Groups and Coding.

COURCE –MTC 102	Course Specify Outcomes:-	METHODOLOGY	REFRENCE BOOK	NO OF LECTUERS
1.General Vector Spaces: Real vector spaces. Subspaces. Linear independence. Basis and dimensions. Row space, Column space and null space. Rank and Nullity.	a) Clear concept and define a term of General Vector Spaces b) Solve problems on Basis and dimensions, Row space, Column space and null space, Rank and Nullity. c) Define and explain Subspaces, Linear independence.	DEMOSTRATION	M. Artin, Algebra, Prentice Hall of India , New Delhi, (1994).	**14**

2.Eigen values and Eigen : Eigen values and Eigen vectors. Diagonalization. Quadratic forms. vectors	a) Obtain basic concept of Eigen values and Eigen vectors. b) Solve problems DiagonalizationQuadratic forms.	PPT, VIDEO LECTURES, DEMOSTREATION	(4) A. Ramchandra Rao and P. Bhimasankaran, Linear Algebra, Tata McGraw Hill, New Delhi (1994).	**09**
3.Linear Transformation: General linear transformations. Kernel and range. (Rank nullity theorem without proof.) Inverse linear transformation. Matrix of general linear transformation.	a) Clear concept and define a term of General linear transformations b) Solve problems on Kernel and range, Inverse linear transformation, Matrix of general linear transformation.	PPT, VIDEO LECTURES, DEMOSTREATION	A. Ramchandra Rao and P. Bhimasankaran, Linear Algebra, Tata McGraw Hill, New Delhi (1994).	**10**
4.Groups and Coding: Cyclic group, normal subgroup. Products and quotients of groups. Coding of binary information and error detection Decoding and error correction. Public key cryptology.	a) Clear concept and define Cyclic group, normal subgroup Products and quotients of groups. b) Define and explain Coding of binary information and error detection, Decoding and error correction. Public key cryptology.	DEMOSTREATION	A. Ramchandra Rao and P. Bhimasankaran, Linear Algebra, Tata McGraw Hill, New Delhi (1994).	**15**

Reference Books:

(1) M. Artin, Algebra, Prentice Hall of India , New Delhi, (1994).

(2) K. Hoffmann and R. Kunze Linear Algebra, Second Ed. Prentice Hall of India New Delhi, (1998).

(3) S. Lang, Introduction to Linear Algebra, Second Ed. Springer-Verlag, New Yark, (1986).

(4) A. RamchandraRao and P. Bhimasankaran, Linear Algebra, Tata McGraw Hill, New Delhi (1994).

(5) G. Strang, Linear Algebra and its Applications. Third Ed. Harcourt Brace Jovanovich, Orlando, (1988).

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DEPARTMENT OF COMPUTER SCIENCE

Course: Numerical Analysis (Sem - I)

Name of the Teacher: Prof. Seema Patil

Class: S.Y.B.Sc. (C.S.) Pattern:2013(Semester)

Course Outcomes: COs: Numerical Analysis

CO 1) Use of numerical analysis is to provide efficient methods for obtaining numerical answers to problems.
CO 2) Perform an error analysis for a given numerical method.
CO 3) Derive appropriate numerical methods to solve algebraic and transcendental equations.
CO 4) Evaluate a derivative at a value using an appropriate numerical method.
CO 5) Calculate a definite integral using an appropriate numerical method.

Course: Numerical Analysis	Course Specific Outcomes CSO	Methodology	Reference Book	No.of Lectures
Errors: Accuracy of Numbers, Errors .	Apply rounding off technique. Know the different types of errors	Constructive	An Introduction to Numerical Analysis :K.E. Atkinson	2
Algebraic & Transcendental equation: False Position Method Newton-Raphson Method	To understand trigonometric, logarithmic exponential functions. Apply the methods for solving transcendental equation.	Constructive	An Introduction to Numerical Analysis :K.E. Atkinson	5
Calculus of finite differences: Differences, Forward Differences, Backward Differences, Central Differences, Other Differences, Properties of Operators, Relation between Operators, Technique to determine the Missing Term.	Identify the different operators. To understand technique to determine the missing term.	Constructive	An Introduction to Numerical Analysis :K.E. Atkinson	10
Interpolation with equal interval : Newton's Gregory Formula for Forward Interpolation , Newton's Gregory Formula for Backward Interpolation ,Central Difference Formulae Gauss Forward Difference Formula ,Gauss Backward Difference Formula ,Bessel's Interpolation Formula .	Know the concept of interpolation. To know the different methods of interpolation.	Constructive	An Introduction to Numerical Analysis :K.E. Atkinson	10
Interpolation with unequal interval: Lagrange's Interpolation Formula , Divided	To understand the concept of interpolation with unequal interval.To knows the different	Constructive	An Introduction to Numerical Analysis :K.E. Atkinson	8

Difference ,Newton's Divided Difference Formula, Hermite's Interpolation Formula	methods of interpolation with unequal interval. .			
Numerical Integration: General Quadrature Formula , Trapezoidal Rule ,Simpson's one-Third Rule , Simpson's Three-Eight Rule ,Euler-Maclaurin's Formula	To know quadrature formulae for approximate integration of a function. Use different methods to determine numerical integration.	Constructive	An Introduction to Numerical Analysis :K.E. Atkinson	6
Numerical Solution of Ordinary Differential Equation: Euler's Method ,Euler's Modified Method, Runge-Kutta Method ,Milne's Predictor-Corrector Method.	To know the concept of ordinary differential equation. Use the different methods for solving ordinary differential equation.	Constructive	An Introduction to Numerical Analysis :K.E. Atkinson	7

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DEPARTMENT OF COMPUTER SCIENCE

Course: Data Structure using C

Name of the Teacher: Prof. Gauri Marne

Class: S.Y.B.Sc. (C.S.) Pattern:2013(Semester)

Course Outcomes: COs:

CO 1) Choose appropriate data structure as applied to specified problem definition.

CO 2) Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.

CO 3) Describe and explain the time complexity for inserting, finding, and deleting items to/from the various data structures

CO 4) Able to use linear and non-linear data structures like stacks, queues , linked list etc.

Course: Data Structure using C++	**Course Specific Outcomes CSO**	**Methodology**	**Reference Book**	**No.of Lectures**
Introduction to Data Structure Concept 1.2 Data type, Data object, ADT 1.2.1 Data Type	Identify the suitable Data structure for the given data.	Lecture	Fundamentals of Data Structures ---- By Horowitz Sahani (Galgotia)	3
Algorithm analysis 2.1 Algorithm – definition, characteristics 2.2 Space complexity, time complexity 2.3 Asymptotic notation (Big O, Omega Ω)	Describe and explain the time complexity for inserting, finding, and deleting items to/from the various data structures.	Lecture	Fundamentals of Data Structures ---- By Horowitz Sahani (Galgotia)	2
Linear data structures 3.1 Introduction to Arrays - array representation 3.2 Sorting algorithms with efficiency - Bubble sort, Insertion sort, Merge sort, Quick Sort 3.3 Searching techniques –Linear Search, Binary search	Apply searching and sorting techniques on array	Constructive	Data Structures using C and C++ ---- By YedidyahLangsam, Aaron M. Tenenbaum, Moshe J. Augenstein	06
Linked List 4.1 Introduction to Linked List 4.2 Implementation of Linked List – Static & Dynamic representation, 4.3 Types of Linked List 4.4 Operations on Linked List -	Create different types of LL, Implement different applications of LL, Perform different operations on LL.	Constructive	Data Structures using C and C++ ---- By YedidyahLangsam, Aaron M. Tenenbaum, Moshe J.	08

create, display, insert, delete, reverse, search, sort, concatenate &merge 4.5 Applications of Linked List – polynomial manipulation 4.6 Generalized linked list – Concept and Representation			Augenstein	
Stacks 5.1 Introduction 5.2 Representation- Static & Dynamic 5.3 Operations 5.4 Application - infix to postfix,infix to prefix, postfix evaluation, 5.5 Simulating recursion using stack	Implement and apply operations on Stack, Perform expression conversion using stack	Lecture	Fundamentals of Data Structures ---- By Horowitz Sahani (Galgotia)	06
Queues 6.1 Introduction 6.2 Representation - Static & Dynamic 6.3 Operations 6.4 Circular queue, priority queue (with implementation) 6.5 Concept of doubly ended queue	Implement and apply operations on Queue, Describe CPU scheduling using queue.	Lecture	Introduction to Data Structures using C---By Ashok Kamthane	6
Trees 7.1 Concept & Terminologies 7.2 Binary tree, binary search tree 7.3 Representation – Static and Dynamic 7.4 Operations on BST – create, Insert, delete, traversals (preorder, inorder, postorder), counting leaf, non-leaf & total nodes , non recursiveinorder traversal 7.5 Application - Heap sort 7.6 Height balanced tree- AVL trees- Rotations, AVL tree examples.	Create BST, Create AVL trees, Perform operations on BST, Perform Heap sort	Constructive	Introduction to Data Structures using C---By Ashok Kamthane	12
Graph 8.1 Concept & terminologies 8.2 Graph Representation – Adjacency matrix, adjacency list, inverse Adjacency list, adjacency multilist, orthogonal list 8.3 Traversals	Represent Graph in various forms like matrix, List etc. Perform Graph Traversal Describe AOV and AOE network.			08

– BFS and DFS 8.4 Applications – AOV network – topological sort, AOE network – critical path				

References:

1. Fundamentals of Data Structures ---- By Horowitz Sahani (Galgotia)

2. Data Structures using C and C++ --- By YedidyahLangsam, Aaron M. Tenenbaum, Moshe J. Augenstein

3. Introduction to Data Structures using C---By Ashok Kamthane

4. Data Structures using C --- Bandopadhyay&Dey (Pearson) 5. Data Structures using C ---By Srivastava BPB Publication.

Course Outcome: COs: Relational Database Management System

CO 1) To Understand fundamental concepts of RDBMS (PL/PgSQL)

CO 2) To understand principles of databases

CO 3) To Understand database management operations

Course **S.Y.B.Cs (CS) CS-212**	**Course Specific Outcome** **CSO**	**Methodology**	**Reference book**	**No. of Lectures**
Relational Database Design Preliminaries Functional Dependencies Basic concepts : Closure of a set of functional dependencies, Closure of attribute set, Canonical cover, Decomposition. PL/PgSqL: Datatypes, Language structure ,Controlling the program flow, conditional statements, loops , Views , Stored Functions, Stored Procedures , Handling errors and exceptions, Cursors , Triggers	To understand the notion of functional dependencies & define Normal forms To understand the goal of Relational Database Design which allows to store information To understand how to retrieve data from database	Demonstrative	Books 1	**14**

Transaction Concepts and concurrency control Describe a transaction, properties of transaction, state of the transaction. Schedules, types of schedules, concept of Serializability, precedencegraph for Serializability. Ensuring Serializability by locks, different lock modes, 2PL and its variations. Basic timestamp method for concurrency, Thomas Write Rule. Locks with multiple granularity, dynamic database concurrency (Phantom Problem). Timestamps versus locking. Deadlock handling methods Detection and Recovery (Wait for graph). Prevention algorithms (Wound-wait, Wait-die)	To understand the concepts those are needed in Transaction Processing Systems. To understand Basic Concepts & Theory those are needed to ensure correct execution of transaction. To understand Transaction concept by using various Live Applications .	Demonstrative	Books 1,2	**14**
Database Integrity and Security Concept: Domain constraints , Referential Integrity, Methods for database security Discretionary access control method, Mandatory access control and role base access control for multilevel security. Use of views, Overview of encryption technique for	To understand Referential Integrity. To understand Security issues & threats to databases. To understand Techniques & Methods used for protecting the database	**Lecture**	Books 2,4	**8**

security. Statistical database security				
Crash Recovery Failure classification, Recovery concepts , Log base recovery techniques (Deferred and Immediate update) Checkpoints, Recovery with concurrent transactions (Rollback, checkpoints, commit) Database backup and recovery from catastrophic Failure.	To Understand Recovery with concurrent transactions (Rollback, checkpoints, commit) To Understand Various Failure Types & Recovery Schemes	**Lecture**	Books 2,3	**8**

Client-Server Technology: Describe client-server computing. Evolution of Client - Server information systems. Client – Server Architecture benefits. Client Server Architecture - Components, Principles, Client Components - Communication middleware components - Database middleware components - Client Server Databases	To Understand growing need for Enterprise Data Access. To Understand Client-Server computing. To Understand Client – Server Architecture benefits	**Lecture**	Books 1,2,3	**04**

References:-

1. Fundamentals of Database Systems (4th Ed) By: Elmasri and Navathe

2. Database System Concepts (4th Ed) By: Korth, Sudarshan, Silberschatz

3. Practical PostgreSQL O'REILLY

4. Beginning Databases with PostgreSQL, From Novice to Professional, 2nd Edition By Richard Stones , Neil Matthew, Apress

Prof.Harshada Bobade

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DEPARTMENT OF COMPUTER SCIENCE

Course Name – Object oriented programming using C++

Course Code – CS 221

Name of the Teacher – Prof. Pandit Supriya P.

Course Outcome –

CO1 : Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.

CO2: Understand dynamic memory management techniques using pointers, constructors, destructors

CO3: Describe the concept of function overloading, operator overloading, virtual functions and polymorphism

CO4: Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.

CO5: Demonstrate the use of various OOPs concepts with the help of programs

Course Syllabus	Course Specific Outcome CSO	Methodology	Reference Book	No of Lectures
Object oriented concepts 1.1 Object oriented concepts 1.2 Features, advantages and Applications of OOPS	Understand classes and objects, Define classes with data member and member functions, Write Simple c++ program	Lecture	Object Oriented Programming with C++ by Robert Lafore	02
Introduction to C++ 2.1 Data types, new operators and keywords, using namespace concept 2.2 Simple C++ Program 2.3 Introduction to Reference variables 2.4 Usage of 'this' pointer 2.5 Classes and Objects 2.6 Access specifiers 2.7 Defining Data members and Member functions 2.8 Array of objects	Describe and explain object oriented methodology, defines data types, operators, access specifiers.	Constructive	Object Oriented Programming with C++ by Robert Lafore	06
Function in C++ 3.1 Call by reference, Return by reference 3.2	Implements functions with parameters, Implement function overloading and default	Constructive	Object Oriented Programming with C++ by E.	08

Function overloading and default arguments 3.3 Inline function 3.4 Static class members 3.5 Friend Concept – Function, Class	argument, Use inline, friend functions and static members		Balagurusamy	
Constructors and destructor 4.1 Types of constructors 4.2 Memory allocation (new and delete) 4.3 Destructor	Implement different types of constructors, Memory management using constructor	Constructive	Object Oriented Programming with C++ by E. Balagurusamy	04
Operator overloading 5.1 Overloading Unary and Binary operators 5.2 Overloading using friend function 5.3 Type casting and Type conversion	Overload unary and binary operators using member function and friend function Overload insertion and extraction operator	Constructive	Object Oriented Programming with C++ by E. Balagurusamy	04
Inheritance 6.1 Types of inheritance with examples 6.2 Constructors and destructor in derived classes 6.3 Virtual base classes, Virtual functions and Pure virtual function 6.4 Abstract base classes	Use and describe types of inheritance, Implement virtual and abstract base classes, Use constructors in derived classes	Use of ICT	Object Oriented Modeling and Design by James Rumbough	08
Managing Input and Output using C++ 7.1 Managing console I/O 7.2 C++ stream classes 7.3 Formatted and unformatted console I/O 7.4 Usage of manipulators	Use and descrive C++ stream classes	Use of ICT	Object Oriented Modeling and Design by James Rumbough	04
Working with files 8.1 File operations – Text files, Binary files 8.2 File stream class and methods 8.3 File updation with random access 8.4 Overloading insertion and extraction operator	Perform different file operations, Manipulate file pointers, Access File randomly	Constructive	Object Oriented Modeling and Design by James Rumbough	06
Templates 9.1 Introduction to templates 9.2 Class	Create function and class templates	Constructive	Let us C++ by – YashwantKanitkar	4

templates, function templates and overloading of function templates 9.3 Templates with multiple parameters				
Exception Handling in C++ 10.1 try, catch and throw primitives	Use throw, catch statements	Constructive	Let us C++ by – YashwantKanitkar	02

Reference Books: -

1. Object Oriented Programming with C++ by Robert Lafore

2. Object Oriented Programming with C++ by E. Balagurusamy

3. Object Oriented Modeling and Design by James Rumbough

4. The Complete Reference C++ by Herbert Schildt

5. Let us C++ by – YashwantKanitkar

6. Mastering C++ by Venugopal, T Ravishankar, RajkumarTHM Pub.

7.Trouble free C++ by HarimohanPande, ANE publication

[Prof. Supriya P. Pandit]

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DEPARTMENT OF COMPUTER SCIENCE

Course Name: - Software Engineering (SYBSc (cs) Sem-II)

Name of the Teacher – Prof. More S.S.

Course Outcome:-

CO1: The ability to analyze, design, verify, validate, implement, apply, and maintain software systems.

CO2: A general understanding of software process models such as the waterfall and evolutionary models.

CO3: Understanding of software requirements and the SRS documents.

CO4: Understanding of the role of project management including planning, scheduling, risk management.

CO5: Ability to develop, maintain and evaluate large-scale software systems.

Course Syllabus	Course Specific Outcome CSO	Methodology	Reference Book	No of Lectures
Introduction to System concept Definition , Elements of System ,Characteristics of System , Types of System , System Concepts	Understand the system concept and its types. Knowledge on Characteristics of Software	Constructive	Software Engineering - Roger s. Pressman	6
Requirement Analysis Definition of System Analysis , Requirement Anticipation, Knowledge and Qualities of System Analyst, Role of a System Analyst , Feasibility Study And It's Types , Fact Gathering Techniques , SRS(System Requirement Specification)	Describe the concept and role of System Analyst. Student will understand Fact Finding Techniques and they will get knowledge on system request specification	Constructive	Software Engineering - Roger s. Pressman	8
Introduction to Software Engineering Definition Need for software Engineering Software Characteristics Software Qualities (McCall's Quality Factors	Describe the concept of Software Engineering. Student will Understanding differences between software and hardware. Knowledge on McCall's Quality Factors.	Constructive	SADSE (System Analysis Design) - Prof. Khalkar and Prof. Parthasarathy	6
Software Development Methodologies SDLC (System Development Life Cycle) , Waterfall Model,	Understand the process of Developing software in different phases. Student will get Knowledge on concept of SDLC, Spiral and Prototype	Constructive	SADSE (System Analysis Design) - Prof.	6

Spiral Model, Prototyping Model ,RAD MODEL	Model. Understanding of RAD Model and concept of maintenance.		Khalkar and Prof. Parthasarathy	
Analysis and Design Tools Entity-Relationship Diagrams ,Decision Tree and Decision Table, Data Flow Diagrams (DFD), Data Dictionary , Elements of DD , Advantage of DD, Pseudo code ,Input And Output Design , CASE STUDIES (Based on Above Topic)	Student will get detail Knowledge about design concept	Active Learning	SADSE (System Analysis Design) - Prof. Khalkar and Prof. Parthasarathy. Software Engineering - Roger s. Pressman	10
Structured System Design Modules Concepts and Types of Modules Structured Chart Qualities of Good Design Coupling, Types of Coupling Cohesion, Types of Cohesion	Understand the concept of Modules with their relationship.	Use of ICT	SADSE (System Analysis Design) - Prof. Khalkar and Prof. Parthasarathy. Software Engineering - Roger s. Pressman	6
Software Testing Definition, Test characteristics , Types of testing , Black-Box Testing , White-Box Testing ,Unit testing , Integration testing , Validation , Verification	Knowledge of testing and their types. Understanding the Concept of Verification and validation.	Use of ICT	SADSE (System Analysis Design) - Prof. Khalkar and Prof. Parthasarathy. Software Engineering - Roger s. Pressman	6

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DEPARTMENT OF COMPUTER SCIENCE

SUBJECT NAME: Computational Geometry **CLASS – S.Y B.Sc. (COMPUTRE SCIENCE)**

PAPER: -MTC :221 SEM- 2st

NAME OF SUBJECT TEACHER:- MS. PRIYANKA JAISWAL

Course outcome:-

A) Relational understanding of mathematical concepts and concerned structures,and should be able to follow the patterns involved, mathematical reasoning.
B) Adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences.
C) Development and to equip them with mathematical modeling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment Enabling students to develop a positive attitude towards mathematics as an interesting
D) Clear concept Twodimensional transformations, Three dimensional transformations, Plane Curves, Space curves

COURCE –MTC 102	Course Specify Outcomes:-	METHODOLOGY	REFRENCE BOOK	NO OF LECTUERS
1.Two dimensional transformations: Representation of points. Transformations and matrices. Transformation of points. Transformation of straight lines. Midpoint transformation. Transformation of parallel lines. Transformation of intersecting lines. Transformation: rotations, reflections, scaling, shearing. Combined transformations. Transformation of a unit square. Solid body transformations. Transformation and homogeneous coordinates. Translation. Rotation about an arbitrary point. Reflection through an arbitrary line. Projection	a)Find and solve to clear concept and define Representation of points, Transformations and matrices, Transformation of points, Transformation of straight lines, Midpoint transformation, Transformation of parallel lines, Transformation of intersecting lines. b)based examples of Transformation of a unit square, Solid body transformations, Transformation and homogeneous coordinates. Translation, Rotation about an arbitrary point, Reflection	DEMOSTREATION	Schaum Series, Computer Graphics. - M. E. Mortenson,	16

– a geometric interpretation of homogeneous coordinates. Overall Scaling. Point at infinity.	through an arbitrary line.			
2.Three dimensional transformations: Three dimensional – Scaling, shearing, rotation, reflection, translation. Multiple transformations. Rotation about – an axis parallel to coordinate axes, an arbitrary axis in space. Reflection through – coordinate planes, planes parallel to coordinate planes, arbitrary planes.	a)Find and solve to clear concept and define Representation of points, Transformations and matrices, Transformation of points, T0ransformation of straight lines, Midpoint transformation, Transformation of parallel lines, Transformation of intersecting lines. b)Applications based examples of Transformation of a unit square, Solid body transformations, Transformation and homogeneous coordinates. Translation, Rotation about an arbitrary point, Reflection through an arbitrary line	DEMOSTREATION	Schaum Series, Computer Graphics. - M. E. Mortenson,	**16**
3.Plane Curves: Non – parametric curves. Parametric curves. Parametric representation of a circle and generation of circle. Parametric representation of an ellipse and generation of ellipse. Parametric representation of a parabola and generation of parabolic Segment. Parametric representation of a hyperbola and generation of hyperbolic segment.	a)Introduction, and basic concept related problems Curve representation, Non – parametric curves, Parametric curves. b)Clear concept and define and explain examples Parametric representation of a circle and generation of circle, Parametric representation of an ellipse and generation of ellipse, Parametric representation of a parabola and generation of parabolic Segment	DEMOSTREATION	Schaum Series, Computer Graphics. - M. E. Mortenson,	**10**
4.Space curves: Bezier Curves – Introduction, definition, properties (without proof), Curve fitting (up to n = 3), equation of the curve in matrix	a)Clear concept and define and explain examples Bezier Curves b)Define and solve Curve fitting (up to n = 3), equation of the	PPT, VIDEO LECTURES, DEMOSTREATION	Schaum Series, Computer Graphics. - M. E.	**10**

form (upto n = 3)	curve in matrix form (up to n = 3)		Mortenson,	

Reference books: -Schaum Series, Computer Graphics. - M. E. Mortenson,

Computer Graphics Handbook, Industrial PresInc

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DEPARTMENT OF COMPUTER SCIENCE

Course: Operation Research

Name of the Teacher: Prof. Seema Patil

Class: S.Y.B.Sc.(C.S.) Pattern:2013(Semester II)

Course Outcomes: COs: Operation Research

CO 1) Know the various optimization techniques.
CO 2) Formulate and solve problems as optimization techniques.
CO 3) Develop linear programming (LP) models.
CO 4) Set up decision models and use some solution methods for optimization problems.
CO 5) Propose the best strategy using decision making methods under game theory.

Course: Operation Research	Course Specific Outcomes CSO	Methodology	Reference Book	No.of Lectures
Modeling with Linear Programming: Two-Variable LP Model , Graphical LP Solution , Linear Programming Applications ,Production Planning .	Apply optimization technique in the field of production. Formulate the linear programming problem.	Constructive	Operations Research by Dr. S. D. Sharma	6
The Simplex Method: LP Model in Equation Form ,Transition from Graphical to Algebraic Solution,The Simplex Method , Artificial Starting Solution , M-Method, Special Cases in Simplex Method	To understand standard form and canonical form of LPP Apply the simplex methods and Big M method for solving LPP.	Constructive	Operations Research by Dr. S. D. Sharma	12
Duality: Definition of the dual problem ,Primal dual relationships.	Convert given L.P.P.in to dual. Primal dual relationships. To understand technique of solving dual.	Constructive	Operations Research by Dr. S. D. Sharma	8
Transportation Model and Its Variants: Definition of the Transportation problem ,The Transportation Algorithm ,The Assignment Model.	Apply optimization technique in the field of transportation. To understand the different methods of solving the T.P. Know assignment model.	Constructive	Operations Research by Dr. S. D. Sharma	12
Decision Analysis and Games:	Optimal solution of two person zero sum games	Constructive	Operations Research by Dr.	10

Optimal solution of two person zero sum games, Solution of mixed strategy games.	To understand the basic concepts of game theory. To know the different methods of solving games. .		S. D. Sharma	