



St. JOHN'S COLLEGE OF ARTS & SCIENCE

(Accredited with B++ by NAAC & Approved by UGC under section 2(f) & 12(B) status)

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(A Christian Minority Institution)

**St. John's College Road, Ammandivilai, Kanyakumari District - 629 204,
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ELECTIVE COURSES – BCA

B.C.A.,

SYLLABUS

**FROM THE ACADEMIC YEAR
2023 - 2024**

**ManonmaniamSundaranar University
Tirunelveli**

Elective Course: EC1 Discrete Mathematics

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
	DISCRETE MATHEMATICS	Elective	4	-	-	I	3	25	75	100

COURSE OUTCOMES

On Successful completion of the course, the student will be able to

CO1: To recall basic concepts for clear understanding of mathematical principles

CO2: To explain practical problems.

CO3: To construct matrices using discrete mathematics

CO4: To analyze techniques to draw graph using mathematics

CO5: To design graphs using their representations

Unit-I: RELATIONS

12 Hours

Introduction to Relations – Binary relation – Classification of Relations – Composition of Relations – Inverse of Relation – Closure operation on Relations – Matrix representation of Relation.

Unit-II: FUNCTIONS

12 Hours

Introduction to Functions – Addition and Multiplication of Functions - Classifications of Functions – Composition of Function – Inverse Function.

Unit-III: MATHEMATICAL LOGIC

12 Hours

Introduction – Statement (Propositions) – Laws of Formal Logic – Basic Set of Logical operators/operations - Propositions and Truth Tables – Algebra Propositions - Tautologies and Contradictions.

Unit-IV: MATRIX ALGEBRA

12 Hours

Introduction – Definition of a Matrix - Types of Matrices – Operations on Matrices – Related Matrices – Transpose of a Matrix – Symmetric and Skew-symmetric Matrices – Determinant of a Matrix – Typical Square Matrices – Adjoint and Inverse of a Matrix – Singular and Non-singular Matrices – Adjoint of a Square Matrix – Properties of Adjoint of a Matrix – Properties of Inverse of a Matrix.

Unit-V: GRAPH

12 Hours

Introduction – Graph and Basic Terminologies – Types of Graphs – Sub Graph and Isomorphic Graph – Operations on Graphs – Representation of Graph.

Text Book:

DISCRETE MATHEMATICS, Swapna Kumar Chakraborty and Bikash Kanti Sarkar, OXFORD University Press.

Reference Books:

1. DISCRETE MATHEMATICS, Third Edition, Seymour Lipschutz and Marc Lars Lipson, Tata McGraw Hill Education Private Limited.

2. Discrete Mathematical Structures with Applications to Computer Science by J.P. Tremblay, R. Manohar TMH edition

3. https://www.tutorialspoint.com/discrete_mathematics

Mapping with Programme Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	2	3
CO5	3	3	2	3	3	2
Weightage of course contributed to each PSO	15	15	14	15	14	14

S-Strong-3 M-Medium-2 L-Low-1

EC2: Elective Course **OPTIMIZATION TECHNIQUES**

Course objectives:

1. To apply various optimization techniques for decision making.
2. To introduce the use of variables for formulating complex mathematical models in management, science and industrial applications

Course Outcome:

On successful completion of the course, the learners will be able to CO1. Formulate and solve Linear Programming Problems.

CO2. Analyze the usage of Assignment Problems. CO3. Evaluate Transportation Models.

CO4. Apply PERT and CPM techniques to find the optimal solution.

UNIT I

12 hours

INTRODUCTION OPERATIONS RESEARCH

The Nature and Meaning of OR – Management – Applications of OR
– Modeling in OR – General methods for solving OR models – Scope of OR –
Advantages and disadvantages of OR

UNIT II

12 hours

LINEAR PROGRAMMING PROBLEM

Linear Programming Problem: Formulation of LP problems –
Graphical solution of LP problems – General formulation of LPP – Slack
and Surplus variables – Standard form of LPP

UNIT III

12 hours

ASSIGNMENT PROBLEMS

Assignment Problem: Mathematical formulation – Hungarian method –
Unbalanced assignment problem – Various types

UNIT IV

12 hours

TRANSPORTATION PROBLEMS

Transportation Model: Mathematical formulation – Matrix form – Methods
for finding Initial Basic Feasible solution and Optimal solution.

UNIT V**12 hours****PERT AND CPM TECHNIQUES**

PERT and CPM Techniques: Basic Steps – Network Diagram representation – Rules for drawing Network Diagram – Labeling Fulkerson's I-J Rule – Time Estimates and Critical Path in Network Analysis – Examples on optimum duration and minimum duration cost – PERT.

CO-PO –
PSO Map
ping

OPTIMIZATION TECHNIQUES											
CO	PO					PSO					COGNITIVE LEVEL
	1	2	3	4	5	1	2	3	4	5	
CO1	S	S	S	M	S	S	S	M	S	S	K-2
CO2	S	S	M	S	S	S	S	S	S	S	K-1
CO3	S	S	M	S	S	S	S	S	S	S	K-3
CO4	S	S	M	S	S	S	S	S	S	S	K-5
CO5	S	S	M	S	S	S	S	S	S	S	K-6

Strongly Correlated – S, Moderately Correlated – M, Weakly Correlated – L

TEXTBOOK

S.D.Sharma, "Operations Research", Tenth Edition, Pearson, 2017.

REFERENCE BOOKS

1. Hamdy A. Taha, "Operations Research", Ninth Edition, Pearson, 2016.
2. V. Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan, "Resource Management Techniques", Ninth Edition, A.R. Publications, 2015.

COMPUTER GRAPHICS

Course Code: -----

L	T	P	C
4	0	0	4

COURSE OBJECTIVES:

- To study various graphical Input and Output devices.
- To study how to manipulate graphics object by applying different transformations.
- To study different algorithms for drawing lines, ellipse, circle parabola etc.

COURSE OUTCOMES:

- Understand the structure of modern computer graphics systems.
- Understand the basic principles of implementing computer graphics primitives.
- Develop design and problem-solving skills with application to compute graphics.

UNIT – 1 INPUT AND OUTPUT DEVICES

Introduction: Application and Operations of Computer Graphics - Graphics Packages – Requirements of a Graphical System – GUI. Common Input Devices – Graphical output Devices Raster Scan Video Principle - Raster Scan CRT Monitors – Color Raster Scan System – Plasma Display – LCD – Hard copy Raster Devices - Raster Scan System – Memory Tube Displays – Plotters – Graphics Accelerators – Coprocessors.

UNIT – 2 ALGORITHMS

Scan Conversion – Methods – Polynomial Method – DDA algorithms for line drawing Algorithm, Circle, Ellipse, Parabola – Bresenham's Line Drawing Algorithm – Bresenham's Circle Drawing Algorithm – Problem of Scan Conversion – Solid Areas – Odd Even Methods – Winding Number Method - Solid Area Filling – Algorithms – Boundary, Flood Fill Algorithm.

UNIT - 3 TRANSFORMATION

Two Dimension Transformations – Translation – Scaling – Rotation – Transformations of Points and Objects – Homogenous Coordinate System and Transformations – Reflection – Shearing – Three Dimension Transformations - Translation – Scaling – Rotation – Reflection – Shearing.

UNIT - 4 CLIPPING ALGORITHMS

2D Viewing and Clipping – Windows and View Ports – Viewing Transformations – Clipping of lines in 2D – Cohen Sutherland Clipping Algorithms – Visibility – Midpoint subdivision method – parametric Clipping – Polygon Clipping – Sutherland Hodgeman Algorithm – Clipping against Concave windows.

UNIT V HIDDEN SURFACE ALGORITHMS

Hidden Surface Elimination – Black Face Removable Algorithm Z buffer Algorithm.

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1	H	PS01, PS05	H/H	K1
CO2	PO5	M	PS02, PS03	M/H	K6

CO3	PO4,PO3	H/H	PS07	H	K4
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(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create)

TEXT BOOK:

1. Computer Graphics Multimedia and Animation – Malay K.Pakira – PHI Learning 2008.

REFERENCE BOOK:

1. Computer Graphics – Apurva Desai – PHI –2008.
2. PrabhatAndleigh, KiranThakrar – Multimedia system and Design – Prentice Hall2000.

MSU/ 2021-22 / UG-Colleges / Part-III (B.C.A) / Semester – VI / Major Elective II

WEB SERVICES

Course Code: -----

COURSE OBJECTIVES

- To study XML Technologies & XML Applications.
- To study service-Oriented Architecture (SOA) and Application Integration.
- To study services such as. XML,SOAP

COURSE OUTCOMES:

- To create secured Web services.
- Develop Web services using a variety of advanced computer languages and applications.
- Create, develop, and test Web services including a mobile application.

UNIT– 1 INTRODUCTION TO WEBSERVICES

Industry standards, Technologies and Concepts underlying Web Services – their support to Web Services – Applications that consume Web Services.

UNIT - 2XML

XML – its choice for Web Services – Network protocols to backend databases – Technologies – SOAP, WSDL – exchange of information between applications in distributed environment – Locating remote Web Services – its access and usage, UDI specification –and Introduction.

UNIT – 3 WEBSERVICES

A brief outline of web services – conversation – static and interactive aspects of system interface and its implementation, work flow – Orchestration and refinement, Transactions , Security issues – the common attacks – security attacks facilitated within web services quality of services – Architecting of systems to meet users requirement with respect to latency, performance, reliability, QOS metrics, Mobile and wireless services – energy consumption, network band width utilization, portals and services management.

UNIT – 4 WEB APPLICATIONS

Building real world enterprise application using web services – sample source codes to develop web services – steps necessary to build and deploy web services and client applications to meet customer's requirement – Easier development, customization, maintenance, transactional requirements,



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Declaration

I hereby declare that the details and information given above are complete and true to the best of my knowledge and belief.

Dr. V.Y. DASAPPAN M.A., M.Phil., Ph.D.
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