



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)

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ELECTIVE COURSES – BSC MATHEMATICS

2. BASIC PROGRAMMING DESIGN

COURSE OUTCOMES

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

- CO1: Define the basic design in programming
- CO2: Summarize various techniques in program testing
- CO3: To develop and evaluate Programming Languages
- CO4: To analyze computer hardware and software programs
- CO5: To evaluate the Internet Applications

Unit-I

6 Hours

Computer Program: Introduction – Developing a program – Algorithm – Flowchart – Decision Tables.(6L)

Unit-II

6 Hours

Program Testing and Debugging – Program Documentation – Program Paradigms: Unstructured programming, Structured programming and Object Oriented Programming – Characteristics of a Good Programming.

Unit-III

6 Hours

Computer Languages: Evolution Programming Languages – Classification of Programming Languages

– Generation of Programming Languages – Features of Good Programming language.

Unit-IV

6 Hours

Computer Software: Software Definition – Relationship between Software and Hardware - Software Categories : System Software and Application Software – Terminology Software Firmware, Liveware, Freeware, Public Domain Software, Shareware, Commercial Software and Proprietary Software.

Unit V

6 Hours

Evolution of Internet - Internet Basics: Basic Internet Terms – Getting connected to Internet -Internet Applications – E-mail – Searching the Web – Internet and

Viruses.

Text Book:

Introduction to Computer Science, ITL Education Solutions Limited, 2/e, Pearson

Reference Books:

1. Fundamentals of Computers, V.Rajaram, 5th Edition, PHI
2. Introduction to Computers, Peter Norton, 7/e, TMH.

LOCF MAPPING

Course code and title : BASIC PROGRAMMING DESIGN											
CO/PO	PO					PSO					
	1	2	3	4	5	1	2	3	4	5	% of co's
CO1	3	2	3	2	2	2	3	3	3	2	2.5
CO2	3	3	3	2	2	3	3	3	3	2	2.7
CO3	2	3	3	2	2	2	3	3	2	2	2.4
CO4	2	2	2	3	3	2	2	3	3	3	2.5
CO5	2	2	3	3	3	2	2	3	3	2	2.5
Average of CO's = 2.52(high)											

Strongly correlated -3 Moderately correlated -2 weakly correlated -1 No correlation -0

1. HTML

COURSE OUTCOMES

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

CO1: To recall the basic concepts of Web design using HTML.

CO2: To learn the various tags used in HTML

CO3:To make use of Dynamic HTML

CO4:To compare the lists in HTML

CO5:To build Frames

Unit I:

6 Hours

Introduction to HTML: Designing a Home page – History of HTML – HTML generations- HTML Documents-Anchor tag –Hyper links –Sample HTML documents.

Unit II :

6 Hours

Head and Body section: Header Section –Title-Prologue-Links-Colorful web page –Comments lines Designing the body: Heading printing –Aligning the headings- Horizontal rule- paragraph-Tab settings-Image and pictures-Embedding PNG format Images

Unit III:

6 Hours

Ordered and unordered lists: List-Unordered lists- headings in a list – ordered lists- Nested lists. Table handling: Tables- table creation in HTML- Width of the Tables and cells-Cells spanning multiple rows/Columns- Coloring cells – Column specification

Unit IV:

6 Hours

Frames: Frame set - Definition – Frame definition –Nested Frames Web Page Design Project : Frameset Definition – Animals – Birds – Fish Forms: Action attributes –Method attributes –Enctype attribute – Drop down list- sample forms

Unit V:

6 Hours

DHTML and Style sheets: Defining styles –Elements of styles- Linking a style sheet to an HTML document –Inline styles –Internal & External style sheets –Multiple styles(6L)

Text Book:

World Wide Web Design with HTML, C. Xavier, TMH, 2001

Reference Book:

Internet & World Wide Web, H.M.Deital, P.J.Deital & A.B.Goldberg, Pearson Education

Fundamentals of information technology, Mathew's lenon and Alxis leon,
Vijay Nicole privatelimited, Chennai.

LOCF MAPPING

Course code and title : HTML											
CO/PO	PO					PSO					
	1	2	3	4	5	1	2	3	4	5	% of co's
CO1	3	2	2	2	2	2	3	2	2	2	2.2
CO2	2	3	2	3	3	2	3	2	2	2	2.4
CO3	2	2	3	3	3	2	2	3	3	3	2.6
CO4	2	3	2	3	2	2	2	3	3	3	2.5
CO5	2	2	2	3	3	2	2	2	3	3	2.4
Average of CO's = 2.42(high)											

Strongly correlated -3 Moderately correlated -2 weakly correlated-1

No correlation -0

Semester-V
Major Elective-I
DISCRETE MATHEMATICS

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Non Major - I		Discrete Mathematics	60	-	-	4

Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
III	V	25	75	100

Objective: To study concepts of mathematical logics and to understand the basics of Lattices and Boolean Algebra.

Course Outcomes: On successful completion of the course,the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Illustrate and use the statements,notations and connectives .Construct truth table and utilize conditional and biconditional statements.	K2,K3
CO2	Analyze and explain Predicate calculus	K1,K4
CO3	Elaborate Groups and monoids. Also to develop Group codes	K6
CO4	Construct Lattices and special lattices.Analyze and explain Boolean algebra	K5
CO5	Convert From one form to another form (Decimal,Binary,Octal,Hexadecimal). Evaluate Binary addition,subtraction multiplication and division.	K2,K6

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

CO-PSO mapping (Course Articulation Method)

PSOs Cos	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	1	3
CO2	3	3	3	3	2
CO3	3	3	2	1	3
CO4	2	3	3	3	3

CO5	1	3	2	3	2
Total contribution of COs to PSOs	12	14	13	11	13
Weighted Percentage of COs contribution to PSOs	80	93.33	86.67	73.33	86.67

Course Content

UNIT–1: Mathematical logic – Statements and notation, Connectives, Negation, Conjunction, Disjunction, Statement formula and truth table, Conditional and biconditional statements. Well defined formulae, tautologies.

UNIT–2: Normal forms - The theory of inference for the statement calculus, The Predicate, Theory of inference for the Predicate Calculus.

UNIT–3: Algebraic structures - Groups and monoids, Simple properties, Group codes.

UNIT–4: Lattices and Boolean algebra - Lattices as posets, Properties of lattices, special lattices, Boolean algebra, Gating networks, Minimal sum of products.

UNIT–5: Number system and codes - Decimal, Binary, Octal, Hexadecimal – Conversion from one to another – Binary addition, subtraction, multiplication and division, BCD, Weighted excess time, Gray code.

Text Book:

- ❖ J.P. Tremblay and Manohar – Discrete mathematical structures with application to Computer Science (Tata McGraw Hill) New Delhi, 43rd edition 2013.

Books for Reference:

- M. K. Venkataraman and others – Discrete mathematics - The National Publishing Pvt. Ltd. (2000).
- G. Balaji – Discrete mathematics – Balaji Publishers Chennai (2013).
- T. Veerarajan – Discrete mathematics Tata McGraw Hill – 2009.
- Garrett Birkhoff – Lattice Theory, American Mathematical Society (1948).
- M.K. Sen, B.C. Chakraborty, Introduction to Discrete Mathematics, Books and Allied (P) Ltd (2009).

Semester-V
Major Elective-I
OPERATIONS RESEARCH -I

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Major elective		Operations Research-I	60	-	-	4

Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
III	V	25	75	100

Objective: To introduce the various techniques of operations research

Course Outcomes: On successful completion of the course,the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Solve Linear Programming Problem by making use of Graphical method,Simplex method.	K4
CO2	Interpret the concept of duality.Classify primal and dual problems.Utilizing the concept of duality ,solve problems on dual simplex method.	K3
CO3	Solve Transportation problems by making use of North – west corner rule,Matrix-Minima method,Vogel’s Approximation rule. Evaluate Degeneracy and unbalanced transportation problems.	K2,K5
CO4	Determine the solution for Assignment problems.	K1,K6
CO5	Solve sequencing problems.	K5

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

CO-PSO mapping (Course Articulation Method)

PSOs	PSO1	PSO2	PSO3	PSO4	PSO5
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Cos					
CO1	3	3	3	1	3
CO2	2	1	2	3	3
CO3	2	1	2	3	2
CO4	2	3	1	3	3
CO5	3	3	2	3	3
Total contribution of COs to PSOs	12	11	10	13	14
Weighted Percentage of COs contribution to PSOs	80	73.33	66.67	86.67	93.33

Course Content

UNIT-1:

Linear Programming Problem:Mathematical formulation of LPP–Graphical method,Simplex method–Artificial variable technique.

UNIT-2:

Concept of Duality–Primal and Dual problems–Duality–Dual Simplex method.

UNIT-3:

Transportation Problem:North-west Corner rule–Matrix-Minima method–Vogel’s approximation method–MODI method–Degeneracy and unbalanced Transportation problem.

UNIT-4:

Assignment Problem:Hungarian method –Unbalanced assignment problems.

UNIT-5:

Sequencing Problem: n jobs and two machines – n jobs and three machines – 2 jobs and m machines.

TextBook:

- ❖ KantiSwarup, P. K. Gupta and Manmohan – Operations Research – Sultan Chand and sons,(New Delhi)12thedition(2006)

BooksforReference:

- GuptaP.KandD.S.Hira–OperationsResearch– S.Chand&Sons Reprint (2012).
- B. J.RanganathandA. S.Srikantappa–OperationsResearch– YesDeePublishingHouse,Chennai(2017).
- HamdyA.Taha –Operationsresearch,Anintroduction- 8thEditionPrentice–HallIndia(2006).
- A.C.S.Kumar, Operation Research, Yes Dee Publications, Chennai, 3rd Reprint 2019.

Semester-VI

Major Elective- III FUZZY MATHEMATICS

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Major Elective -III		Fuzzy Mathematics	60	-	-	4

Contact hours per semester:60

Contact hours per week :4

Year	Semester	Internal Marks	External Marks	Total marks
III	VI	25	75	100

Objective: To introduce fuzzy concepts to students and to facilitate the students to study fuzzy operations and fuzzy numbers

Course Outcomes: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Explain Crisp sets and fuzzy sets and illustrate the characteristics and significance of Paradigm Shift.	K1,K2
CO2	Elaborate the Additional properties of α cuts and the extension principle for fuzzy sets.	K1,K4
CO3	Perform fuzzy set operations. Also to determine fuzzy complements, fuzzy intersections and fuzzy unions.	K5,K6
CO4	Determine fuzzy numbers and Linguistic variables. Apply arithmetic operations on intervals and on fuzzy numbers. Construct lattice of fuzzy numbers.	K2,K3,K4
CO5	Analyze and classify fuzzy decision making, individual decision making, Multi person decision making problems.	K5,K6

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

CO-PO mapping (Course Articulation Method)

PSOs	PSO1	PSO2	PSO3	PSO4	PSO5
Cos					
CO1	2	3	3	3	3
CO2	2	1	3	3	1
CO3	2	1	2	3	2
CO4	1	2	2	3	2
CO5	2	2	1	2	3
Total contribution of COs to PSOs	9	9	11	14	11
Weighted Percentage of COs contribution to PSOs	60	60	73.33	93.33	73.33

Course Content

UNIT-1:

Crisp Sets–Fuzzy Sets–Basic Types–Basic Concepts–Characteristics and Significance of Paradigm Shift.

UNIT-2:

Additional properties of α -cuts– representations of fuzzy sets– Extension principle for fuzzy sets.

UNIT-3:

Fuzzy set operations–Fuzzy complements–Fuzzy intersections: t-norms–Fuzzy Unions: t-conorms –Combinations of operations.

UNIT-4:

Fuzzy numbers – linguistic variables-arithmetic operations on intervals-arithmetic operations on fuzzy numbers-Lattice of fuzzy numbers-Fuzzy Equations.

UNIT-5:

Fuzzy decision making – Individual Decision Making-Multi-person decision making-fuzzy linear programming.

Text Book:

- ❖ George J. Klir and Bo Bo Yuan–
Fuzzy sets and Fuzzy Logic Theory Applications, Prentice Hall of India, 2002, New Delhi.

Book for Reference:

- George J. Klir and Tina A. Folger–Fuzzy sets, uncertainty and Information – Prentice Hall of India, 2003, New Delhi.

Semester-VI
Major Elective- IV
OPERATIONS RESEARCH-II

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Major Elective -III		Operations Research	60	-	-	4

Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
III	VI	25	75	100

Objective: To introduce games and strategies.Also to understand networking problems.

Course Outcomes: On successful completion of the course,the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Interpret the games and strategies. Solve two persons zero sum games.Make use of mixed strategies and dominance property.	K2,K3
CO2	Analyze the replacement of items that deteriorate with time. Illustrate replace montage of a machine taking money value into consideration and elaborate the replacement of items that completely fail suddenly and Staffing problems.	K1,K5
CO3	Explain the queueing models and to classify into (M/M/1:FCFS),(M/M/1:∞/FCFS),(M/M/S:/FCFS)	K4,K6
CO4	Compose network scheduling using PERT/CPM. Explain the rules of network construction.Make use of PERT calculation.	K2,K3
CO5	Analyse and solve inventory control problems.	K5,K6

➤ K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

CO-PSO mapping (Course Articulation Method)

PSOs	PSO1	PSO2	PSO3	PSO4	PSO5
COs					
CO1	2	3	3	2	3
CO2	2	1	3	2	1
CO3	2	1	2	2	2
CO4	2	2	2	2	1
CO5	1	2	1	1	3
Total contribution of COs to PSOs	9	9	11	9	10
Weighted Percentage of COs contribution to PSOs	60	60	73.33	60	66.67

UNIT-1:

Games and Strategies: Two Person Zero sum Games – The Maximin – Minimax Principle – Games without Saddle Points – Mixed Strategies – Graphical Solution of $2 \times n$ and $m \times 2$ games – Dominance Property.

UNIT-2:

Replacement of items that deteriorate with time – replacement of a machine taking money value into consideration – replacement of items that completely fail suddenly and Staffing Problems.

UNIT-3:

Queueing models: General concept and definitions – characteristics – properties of Poisson process Models ($M/M/1/FCFS$), ($M/M/1:\infty/FCFS$), ($M/M/S/FCFS$).

UNIT-4:

Networks Scheduling by PERT/CPM: Network and basic components – Rules of Network Construction – Time Calculation in network – Critical Path Method – PERT Calculation.

UNIT-V:

Inventory Control : Introduction – Types of Inventories – Inventory decisions – Deterministic inventory Problem – EOQ problems without shortages.

Text Book:

- ❖ Kanti Swarup, P.K. Gupta and Manmohan – Operations Research – Sultan Chand & Sons – 2006, 12th Edition.

Books for Reference:

- Gupta, P.K. and D.S. Hira – Operations Research – S. Chand & Sons – VII Edition..
- B.J. Ranganathan and A.S. Srikantappa – Operations Research, Yes Dee Publishing House, Chennai (2017).
- Hillier, F.S. and G.J. Lieberman – Introduction to Operations Research, 9th Ed., Tata McGraw Hill, Singapore, 2009.
- Hamdy A. Taha, -Operations Research, An Introduction, 8th Ed., Prentice–Hall India, 2006.
- Hadley, G. -Linear Programming, Narosa Publishing House, New Delhi, 2002.



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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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