

BHARATHIAR UNIVERSITY::COIMBATORE-641 046
B. Sc. APPLIED MATHEMATICS WITH COMPULSORY DIPLOMA IN
OPERATION RESEARCH
CBCS PATTERN
(For the students admitted from the academic year **2008-2009** and onwards)
Scheme of Examination

Part	Study Components	Course title	Ins. hrs/ week	Examinations				Credit
				Dur.Hrs.	CIA	Marks	Total Marks	
Semester I								
I	Language – I		6	3	25	75	100	3
II	English – I		6	3	25	75	100	3
III	Core Paper I - Basic Mathematics I		5	3	25	75	100	4
III	Core Paper II- Discrete Mathematics		4	3	25	75	100	4
III	Allied A : Paper I Physics I (or) Accountancy-I		5	3	20	55	75	4
			7	3	25	75	100	5
	Allied Practical		2	-	-	-	-	-
IV	Environmental Studies #		2	3	-	50	50	2
Semester II								
I	Language – II		6	3	25	75	100	3
II	English – II		6	3	25	75	100	3
III	Core Paper III Basic Mathematics – II		5	3	25	75	100	4
III	Core Practical I- PC Software Practical		4	3	40	60	100	4
III	Allied A : Paper I Physics II (or) Accountancy-II		5	3	20	55	75	4
			7	3	25	75	100	5
	Allied Practical		2	3	20	30	50	2
IV	Value Education – Human Rights #		2	3	-	50	50	2
Semester III								
I	Language – III		6	3	25	75	100	3
II	English – III		6	3	25	75	100	3
III	Core Paper IV- Differential Equations and Laplace Transforms		4	3	25	75	100	4
III	Core Paper V- Computer Programming in C (Theory)		3	3	25	75	100	4
III	Allied B - Paper I Statistics for Mathematics		6	3	25	75	100	5
IV	Skill based Subject - Diploma in Operations Research - Paper-I		3	3	25	75	100	3
IV	Tamil @ / Advanced Tamil# (OR) Non-major elective - I (Yoga for Human Excellence)# / Women's Rights#		2	3	75	75	75	2

Semester IV							
I	Language – IV	6	3	25	75	100	3
II	English – IV	6	3	25	75	100	3
III	Core Paper VI-Numerical Methods	4	3	25	75	100	4
III	Core Practical II - Lab : Programming in C	3	3	40	60	100	4
III	Allied B : Paper II – Statistics for Mathematics - II	6	3	25	75	100	5
IV	Skill based Subject 2 - Diploma in Operations Research – Paper II	3	3	25	75	100	3
IV	Tamil @ /Advanced Tamil # (OR) Non-major elective -II (General Awareness #)	2	3	75		75	2
Semester V							
III	Core Paper VII-Modern Algebra	6	3	25	75	100	4
III	Core Paper VIII- Mechanics	6	3	25	75	100	4
III	Core Paper IX - Internet and Web Design - Theory Practical	3	3	20	55	75	4
		2	3	10	15	25	
III	Core Paper X - Graph Theory	5	3	25	75	100	4
III	Elective I	5	3	25	75	100	5
IV	Skill based Subject 3 - Diploma in Operations Research Paper III	3	3	25	75	100	3
Semester VI							
III	Core Paper XI Complex Analysis	6	3	25	75	100	4
III	Core Paper XII Real Analysis	6	3	25	75	100	4
III	Core Paper XIII Programming in C++ - Theory Practical	3	3	20	55	75	4
		2	3	10	15	25	
III	Elective II	5	3	25	75	100	5
III	Elective III	5	3	25	75	100	5
IV	Skill Based Subject 4 Diploma in Operations Research - Project	-	-	-	-	100*	3
V	Extension Activities @	-	-	50	-	50	1
Total						3700	140

* Project report - 80 marks; Viva-voce – 20 marks

@ No University Examinations. Only Continuous Internal Assessment (CIA)

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List of Elective papers (Colleges can choose any one of the paper as electives)		
Elective – I	A	Mathematical Modeling
	B	Mathematics in Finance and Insurance
	C	Astronomy I
Elective – II	A	Astronomy- II
	B	Fuzzy Logic and Neural Networks
	C	Java Programming
Elective - III	A	Combinatorics
	B	Automata Theory & Formal Languages
	C	RDBMS and ORACLE

SEMESTER I - PAPER I BASIC MATHEMATICS I

Objectives

- To introduce basics in mathematics
- To improve analytical skills

- Unit I** Convergency and divergency of series – definitions – elementary results – Comparison tests – De Alemberts and Cauchy’s tests. Absolute convergence – series of positive terms – Cauchy’s condensation Test – Cauchy’s root test -Raabe’s test.
- Unit II** Theory of equations: Roots of an equation – Relations connecting the roots and coefficients . Transformations of equations – Character and position of roots- Descartes’ rule of signs – Symmetric function of roots.
- Unit III** Sphere : Standard equation of a sphere- results based on the properties of a sphere – tangent plane to a sphere – Equations of a circle. Cone whose vertex is at the origin – enveloping cone – of a sphere – Right circular cone – Equation of a cylinder- right circular cylinder.
- Unit IV** Expansions of $\cos n\phi$, $\sin n\phi$, $\cos^n \phi$, $\sin^n \phi$,- Hyperbolic functions separation of real and imaginary parts of $\sin(\alpha+i\beta)$, $\cos(\alpha+i\beta)$, $\tan(\alpha+i\beta)$, $\sinh(\alpha+i\beta)$, $\cosh(\alpha+i\beta)$, $\tanh(\alpha+i\beta)$, $\tan^{-1}(\alpha+i\beta)$.
- Unit V** Logarithm of complex numbers – Summation of trigonometric series – Sum of Sines of n angles in A.P - Sum of Cosines of n angles in A.P- Summation using Complex Quantities (Series in G.P , Binomial and Exponential series only).

Treatment as in

- “Algebra” by T. Natarajan and others (Unit I and II)
- “Analytical Geometry 3D” by P.Duraipandian and others (Unit III)
- “Trigonometry” by S.Narayanan (Unit IV and V)

References

1. Algebra and Trigonometry – Vittal P.R.& Malini V, Margham Publication- Chennai
2. Trigonometry – P.Duraipandian ,Laxmi Duraipandian., Emerald Publishers
3. Solid Geometry – Quasi Zameeruddin and V.K Khanna, Vikas Publishing house

SEMESTER I PAPER II DISCRETE MATHEMATICS

Objectives

- to develop the student's ability to understand and work practically in different applications.
- to make the students skillful in problem solving

- Unit I** Mathematical Logic: Connectives, well formed formula Tautology, Equivalence of formula, Tautological Implications, Duality Law, Normal forms Predicates, Variables and Quantifiers.
- Unit II** Free and bound variables. Theory of inference for statement calculus and predicate calculus: Relations-Equivalence Relations –Composition of relations-Matrices of relations.
- Unit III** Formal languages and automata: Grammars –Types of Grammars-Finite State Automata: Deterministic finite state Automata –non deterministic finite state Automata –conversion of non deterministic finite automata to deterministic Finite state automata
- Unit IV** Mathematical induction-Sets-Sequences and Strings-Number systems – Functions: Composition of functions, Inverse functions, One-to-One functions, Onto functions, One-One and Onto functions, Permutations functions.
- Unit V** Application: Lattices and Boolean Algebra: Lattices as partially ordered sets –some properties of Lattices-Lattices and algebraic systems-sublattices, direct product and homomorphism-some special lattices-Boolean Algebra-Subalgebra, direct product and homomorphism.

Treatment as in

Discrete Mathematical Structures with application to computer science-J. P Trembly and R.P.Manohar, TaTa Mc Graw Hill Pub 1997(unit I, II and III)

Unit – I – 1.1 – 1.2.,1.26,1.28,1.29,2.10,2.11,3.1-3.4

Unit – II –1- 5.4,1- 6.1 to 1- 6.4,2.3.1 to 2.3.5

Unit – III – 3-3.1 to 3-3.3

Unit – V – 4.1,4.2

Discrete mathematics –Richard Johnson Baugh, Macmillan Publishing company

Unit IV –1.6,2.1 –2.3,2.8

References

- 1.Discrete mathematics – Prof.V.Sundaresan, K.S.Ganapathy Subramaniam, K.Ganesan A.R.Publications.
- 2.N Ch S Iyengar &others-Discrete Maths, Vikas
- 3.JK Sharma, “Discrete Maths” , Macmillan India ltd,2003
4. Discrete Mathematics for computer science and Applications
- 5.Element of Discrete Mathematics – TaTa Mc Craw Hill Pub

SEMESTER II - PAPER III BASIC MATHEMATICS II

Objectives

- To introduce basics in mathematics
- To improve analytical skills

Unit - I Application of differential calculus: Curvature, circle of curvature, evolutes, involutes, envelopes. Pedal Equations.

Unit - II Multiple Integrals: Evaluation of multiple integrals, change of order of integration, application of multiple integrals to find area enclosed by plane curves and volume of solids.

Unit - III Beta and Gamma Integrals: Definition, relation connecting Beta and Gamma integrals, properties, evaluation of definite integrals in terms of Beta and Gamma functions.

Unit -IV Vector Calculus: Scalar and vector point functions: Differentiation of vectors, Differential operators: directional derivative. gradient, divergence and curl

Unit - V Integration of vectors: Line, Surface and Volume integrals, statements of Green's Theorem, Gauss and Stoke's Theorem, applications.

Treatment as in

“Calculus Vol.I and Vol.II” by S.Narayanan and T.K.M.Pillai
“Vector calculus” by P.Duraipandian.

References:

1. Differential calculus II – A.R.Vasishtha and Dr.R.K.Gupta, Krishna Prakashan Mandir, Meerut.
2. Integral Calculus – Bali N.P., Laxmi Publications, New Delhi.
3. A Text Book of Vector Calculus, Shanthi Narayanan and J.N..Kapur, S.Chand and Co, New Delhi
4. Vector Calculus, Gupta R, Laxmi Publications, New Delhi.

SEMESTER II - PRACTICAL – I - PC SOFTWARE

Objectives

- to learn the new features and commands.
- to carry out routine jobs on PCs.

MS Word

1. Type a paragraph of 20 lines and perform the following
 - (a) Bold
 - (b) Underline

- (c) Font Change
- (d) Sizing
- (e) Alignment
- (f) Line Spacing
- (g) Page Number

2. Design an Invitation card for a cultural function of your College.

MS Excel

- 3. Maintain a WorkSheet of Marklist of your class for each semester
- 4. Draw graph to illustrate class performance include three types of line, bar and Pie Chart for overall Performance

MS Powerpoint

- 5. Prepare an organization chart for a college environment in powerpoint
- 6. Prepare a powerpoint presentation with all the slide translation facilities

MS Access

- 7. Perform sorting on Name, place, and Pincode of students database and list them in the sorted order
- 8. Create mailing labels for employee database.

SEMESTER III- PAPER IV DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS

Objectives

- to translate problems into the language of differential equations
- to solve the resulting differential equations subject to given conditions
- to interpret the solutions obtained

UNIT- I P.I of equations of second order with constant coefficients :Special methods of finding P.I – for e^{mx} , $\sin mx$, $\cos mx$, $e^{mx}V$ where V is a function of x , x^m –. Linear equations with variable coefficients – Equations reducible to linear equations.

UNIT- II Ordinary Differential Equations – first order higher degree equations – solvable for x, y, p – Clairaut's form – simultaneous differential equations of the form.

$$(i). \quad \begin{aligned} f_1(D)x + f_2(D)y &= F_1(t) \\ g_1(D)x + g_2(D)y &= F_2(t) \end{aligned}$$

where f_1, f_2, g_1, g_2 are rational functions of $D = d/dt$ with constant coefficients, F_1 and F_2 are explicit functions of t .

$$(ii) \quad dx/P = dy/Q = dz/R \quad \text{Conditions of integrability.}$$

Unit- III Partial Differential Equations – Formations of equations by eliminating arbitrary function – Definition of general, particular and complete

solutions – singular and general solutions of first order equations in the standard form

- (ii) $f(p,q) = 0$
- (iii) $f(z,p,q) = 0$
- (iv) $f(x,p) = g(y,q)$
- (iv) $z = px + qy + f(p,q)$
- (v) Charpit's method

Unit- IV

Laplace Transforms : Definition – Transforms of e^{at} , $\cos at$, $\sin at$ and t^n where n is an integer. First shifting theorem – Laplace transforms of $e^{at} \cos bt$, $e^{at} \sin bt$ and $e^{at} t^n$ - Theorems of $L\{f'(t)\}$, $L\{f''(t)\}$.

UNIT V Lagrange method of solving the linear partial differential Equation $Pp + Qq = R$. Inverse Laplace transformation – Application: solution of differential equation with Constant co-efficients using Laplace transformation.

Treatment as in

**“Differential Equations And Its Applications” – by
Narayanan and T.K.M.Pillai**

References

1. Differential Equations – Bali N.P., Laxmi Publications, New Delhi.
2. Differential Equations, Khanna ML, Jai Prakash Nath & Co, Meerut, U.P.
3. Differential Equations, Sharma JM and Gupta, Krishna Prakashan Mandir, Meerut
4. Text Book of Differential Equations, Kapoor NM, Pitambar Publication co, New Delhi

SEMESTER III - PAPER V COMPUTER PROGRAMMING IN C (THEORY)

Objectives

- To improve logical thinking and better understanding of programming techniques
- To learn a language that is well suited for both systems software and business packages

Unit I Importance of C-Basic structure of C programme Character set - Constant, Variables and Data types - C tokens – Keywords and Identifiers – Variables – Data types – Declaration of variables – Assigning values to variables – defining symbolic constants.

- Unit II** Operators and Expressions: Arithmetic operators – Relational operators – Logical operators – Assignment operators – Increment and decrement operators – Conditional operator – Bitwise operator – Special operators – Arithmetic expressions Evaluation of expressions – Precedence of arithmetic operators – Some computational problems – Type conversion in expression. Managing input and output operators: Reading a character - Writing a character – Formatted input – Formatted output
- Unit III** Decision making and branching: Decision making with IF statement – Simple IF statement - The IF ELSE statement - Nesting of IF.. ELSE statement - The ELSE IF ladder – the SWITCH statement - The ?; operator- The GOTO statement Decision-making and looping: The WHILE statement The DO statement The FOR statement- jumps in loops
- Unit IV** Arrays: One-dimensional array – Two-dimensional arrays – Initializing two-dimensional arrays - Multidimensional arrays. Declaring and initializing string variables -reading strings from terminals – writing strings to screen- string handling functions
- Unit V** User defined functions - Need for user defined functions – A multi function programme – The form of C functions - Return values and their types – Calling a function – Category of functions – No arguments and No return values – Arguments with return values.

Treatment as in

“ Programming in C” by E.Balagurusamy. Tata McGraw Hill Publishing Co, 1997.

Reference

“Let us C” – Yashwant Kanitkar, BPB Publications, New Delhi

Semester III - Diploma Course

Subject title: Diploma in Operations Research – Paper I **Credit hours: 3**

Subject description:

This course contains advantages, limitations and applications of O.R, formulation of Linear Programming Problems (L.P.P), methods to solve L.P.P. like simplex method, Charnes Penalty Method and Two Phase Simplex method. Also it deals about duality in L.P.P, Transportation and Assignment Problems with applications

Goal:

It enables the students to use the mathematical knowledge in optimal use of resources.

Objectives:

On successful completion of this course students should have gained knowledge about optimal use of resources.

Unit I:

Basics of O.R – Definition of O.R – Characteristics of O.R - Scientific methods in O.R – Necessary of O.R in Industry – O.R and Decision Making – Scope of O.R in Modern Management – Uses and limitations of O.R. Linear Programming Problem – Formulation of L.P.P – Graphical solutions of L.P.P – Problems.

Unit II:

Simplex Method – Charnes Penalty Method (or) Big – M Method - Two Phase Simplex method – Problems.

Unit III:

Duality in L.P.P – Concept of duality – Duality and Simplex Method – Problems

Unit IV:

The transportation Problems – Basic feasible solution by L.C.M – NWC- VAM- optimum solutions – unbalanced Transportation problems

Unit V:

The Assignment Problems – Assignment algorithm – optimum solutions – Unbalanced Assignment Problems.

References:

1. Operations Research – Prem Kumar Gupta D. S. Hira, S. Chand & Company Ltd, Ram Nagar, New Delhi
2. Operations Research – Kandiswarup, P. K. Gupta, Man Mohan, S. Chand & Sons Education Publications, New Delhi, 12th Revised edition.
Operations Research Principles and Problems: S. Dharani Venkata Krishnan, Keerthi publishing house PVT Ltd.

SEMESTER IV - PAPER VI – NUMERICAL METHODS

Objective

- To find numerical solutions to problems where the exact relationship between the variables are not known.

Unit I Solutions to simultaneous linear equations –Gauss elimination- Gauss Jordan-Gauss Jacobi-Gauss - Seidal iterative method - Triangularization

Unit II Successive bisection method –Newton Raphson method –Successive approximation method –Regula Falsi method-Graph's roots squaring method

- Unit III** Interpolation – Newton`s interpolation formulae –Forward difference Interpolation formula –Backward difference interpolation formula-Divided difference formula –Lagrange`s interpolation formula.
- Unit IV** Central difference – Central Difference formula-Gauss interpolation formula Numerical differentiation. Stirling`s formula –Bessel`s formula- Everett`s formula
- Unit V** Numerical integration –Trapezoidal rule –Simpson`s 1/3rd rule and 3/8th rule for numerical integration. Numerical solutions of ordinary differential equations – Euler`s methods with its modifications –Taylor`s series method – Runge –Kutta method.

Treatment as in

- 1. Numerical methods - P. Kandasamy K.Thilagavathy and K.Gunavathy S.Chand and Company Ltd**
- 2. Numerical methods in Science and Engineering –M.K.Venkataraman National Publishing company 1990 edition.**

Reference

M.K Jain, R.K Iyengar, R.K Jain “ Numerical Methods for Scientific and Engineering Computation”. Wiley Eastern Ltd, New Delhi-1997.

SEMESTER IV- CORE PRACTICAL II - PROGRAMMING IN C

1. Write a program to find the sum, average, and Standard Deviation for a given set of a number.
2. Arrange a set of numbers in ascending order using Quick sort.
3. Arrange a set of numbers in descending order using Heap sort.
4. Implement linear and binary search to find a particular name in a list of names.
5. Write functions for the following Stack Operations
 - (a) Push
 - (b) Pop
 - (c) List stack
6. Write a menu driven program Queue to perform
 - (a) Insertion
 - (b) Deletion
 - (c) Modification
 - (d) Listing of elements using pointers
7. Write a program for linked list representation of employee record and do the following operations using pointers
 - (a) To add a new record
 - (b) To delete a existing record
 - (c) Print the information about an employee
 - (d) Finding the number of employee in the structure.

8. Write a program to perform all manipulation like Insertion, Deletion, Modification in files.
9. Write a program to solve problem using Simpson's and Trapezoidal rule.
10. Write a program to solve problem using Newton – Raphson method.
11. Write a program to solve problem using Lagrange's Interpolation method.
12. Write a program to solve problem using Gauss Elimination method.

Semester IV - Diploma Course

Subject title: Diploma in Operations Research – Paper II

Credit hours: 3

Subject Description:

This course gives emphasis to enhance student knowledge in game theory, performance measures of queues, optimal use of Inventory and Network scheduling with application.

Unit I:

Game Theory – Two person zero sum game – The Maxmini – Minimax principle – problems - Solution of 2 x 2 rectangular Games – Domination Property – (2 x n) and (m x 2) graphical method – Problems.

Unit II:

Queueing Theory – Introduction – Queueing system – Characteristics of Queueing system – symbols and Notation – Classifications of queues – Problems in (M/M/1) : (∞ /FIFO); (M/M/1) : (N/FIFO); (M/M/C) : (∞ /FIFO); (M/M/C) : (N/FIFO) Models.

Unit III:

Inventory control – Types of inventories – Inventory costs – EOQ Problem with no shortages – Production problem with no shortages – EOQ with shortages – Production problem with shortages – EOQ with price breaks.

Unit IV:

Simulation – Introduction – simulation models – Event – Types of simulation - Generation of Random Numbers – Monte-carlo simulation – simulation of queueing system.

Unit V:

Network scheduling by PERT / CPM – Introduction – Network and basic components – Rules of Network construction – Time calculation in Networks – CPM. PERT – PERT calculations – Cost Analysis – Crashing the Network – Problems.

References:

1. Operations Research – Prem Kumar Gupta D. S. Hira, S. Chand & Company Ltd, Ram Nagar, New Delhi

2. Operations Research – Kandiswarup, P. K. Gupta, Man Mohan, S. Chand & Sons Education Publications, New Delhi, 12th Revised edition.
3. Operations Research Principles and Problems: S. Dharani Venkata Krishnan, Keerthi publishing house PVT Ltd.

SEMESTER V- PAPER VII MODERN ALGEBRA

Objectives

- To introduce and develop abstract concepts
- To understand the subject as a tool applicable to all other branches of Science Engineering and Technology

- Unit I** Group Theory: Subgroups, cyclic groups, Normal subgroups and Quotient groups.
- Unit II** Homomorphisms of groups, Automorphisms, Cayley's theorem, Permutation group.
- Unit III** Ring Theory: Definitions and Examples, Special classes of rings Homomorphism, Ideal and Quotient rings, Maximal Ideal, Principal ideal, field, The field of Quotients of an integral domain.
- Unit IV** Vector Spaces: Definition and examples –Basic properties-Linear Independence- Bases-Dimensions. Dual space.
- Unit V** Linear Transformations-Algebra of Linear transformations-Characteristic roots-Matrices.

**Treatment as in " Topics In Algebra" by I.N.Herstein.Second Edition.
(Unit I to Unit II)**

Unit I : 2.4, 2.6,

Unit II : 2.7(till theorem 2.7.1), 2.8, 2.9(theorem 2.9.1), 2.10

Unit III : 3.1-3.6

Unit IV: 4.1-4.3

Unit V : 6.1-6.3.

Reference

"A First Course in Abstract algebra" by John B Fraleigh , 2nd Edition, Addison Wesley Publishing Co.,1975

SEMESTER V - PAPER VIII- MECHANICS

Objectives

- To provide a strong foundation in understanding the concepts of mechanism
- To know how the friction is regulating the motion of objects
- To have a deep knowledge about the motion of particles under the influence of various forces like gravitational force, central force, impulsive force etc.,

STATICS

Unit I Coplanar forces acting on a rigid body: Theorem on three coplanar forces in equilibrium reduction of a system of coplanar forces to a single force and a couple – conditions of equilibrium

Unit II Friction: Laws of friction – angle of friction, coefficient of friction and cone of friction – equilibrium of a body on a rough incline plane – problems involving force of friction

DYNAMICS

Unit III Central Orbits: Radial and transverse components of velocity and acceleration – areal velocity **central** orbits. Differential equation of a central orbit in polar co-ordinates – circular and elliptic orbits

Unit IV Simple harmonic motion: Amplitude, periodic time, and phase-composition of two simple harmonic motions of the same period in a straight line and in two perpendicular lines.

Unit V Impact on a fixed surface: Impulsive force, Impact on a smooth fixed plane, Direct and oblique impact of two smooth sphere loss of kinetic energy during direct and oblique impacts.

Treatment as in
STATICS by M.K.Venkataraman
Unit I : Chapter VI - (Sec 1-13)

Unit II: Chapter VII - (Sec 1-13)
Treatment as in
DYNAMICS by M.K.Venkataraman
Unit III: Chapter XI
Unit IV: Chapter X 10.1 -10.7
Unit V: Chapter VII and VIII

References

- 1.Dynamics by “ S.Narayanan” S.Chand and Company, New Delhi.
- 2.Dynamics by “ N.P.Bali” Lakshmi Publications
- 3.Mechanics by “ P.Duraipandian and Others” S.Chand and Company, New Delhi.

SEMESTER V -PAPER IX - INTERNET AND WEB DESIGN (Theory)

Objectives

- to develop web pages for business entity, educational institution organization and even for individuals in attempting to make their presence felt on the web.
- to learn about Internet concepts.
- to learn various tools used for designing Web pages

Unit I Introduction: uses of computer networks – Network Hardware – Network Software – Reference models.

Unit II Internet: Introduction – The World Wide Web – Internet/Web browsing – Internet Addressing – Beyond surfing – Searching the web: Web search Engine – E-mail: E-mail message (Composing/sending an e-mail message – message – address book – signature – File attachment facility – Setting priority – customizing your mail program – Replying & forwarding e-mail messages)

Unit III HTML and Graphics: HTML 4.0 Tag reference – image maps advanced graphics – tables – frames – forms – style sheets – Microsoft Front page components.

Unit IV Java script: Introduction to Java scripting – The web browser object model manipulating windows and frames with Java script – Using Java script to create smart form – cookies and state maintenance.

Unit V Dynamic HTML: Introduction to Dynamic HTML – Advanced Netscape Dynamic HTML – Advanced Microsoft Dynamic HTML – cross – browsed Dynamic HTML.

Treatment as in

1. Alexis Leon, Mathews Leon – “Internet for Everyone”, UBS publishers Distributor Ltd., 1998
2. Andrew S. Tanenbaum – “Computer Networks”, 4th edition, Pearson Education publication.
3. Eric Ladd abd Lim O’Donnell et al – “Using HTML 4, XML & Java 2”, Platinum edition, Prentice hall of India Pvt.Ltd, 1999.

Reference

Ivan Bayross – “Web Enabled commercial application development using HTML,DHTML, Javascript, Perl CGI”, First edition, BPB publication 2000.

INTERNET AND WEB DESIGN - PRACTICAL

1. Design the HTML page using various types of tags and lists.
2. Design the HTML page using frames and Hyperlinks.
3. Create a Web Page, which shows the timing details of arrival and departure of trains.
4. Design a page that shows the graphical displays.
5. Write a Java script code block-using arrays and generate the current date in words, this should include the day, month, year.
6. Write a Java script code block which checks the contents entered in a form text element. If the text entered is the lower case convert to upper case.
7. Write a Java script code block, which validates a user name and password against hard coded values. (If the given information is wrong display appropriate message)
8. Design a web page using style sheets in DHTML.
9. Design a web page using layers and attributed in DHTML.
9. Design a web XML.

SEMESTER V- PAPER X - GRAPH THEORY

Objectives

- to translate real life situations to diagrammatic representations
- to develop problem solving skills and there by solve real life problems

- Unit I** Graphs- Incidence-Degree- Pendent-Null graph-Walks-Paths and circuits- Subgraphs-Connected graphs- Euler graphs.
- Unit II** Hamiltonian paths and circuits – Traveling salesman problem. Bipartite Graphs. Colourings.
- Unit III** Trees- Properties – Rooted and Binary trees- Spanning trees- Finding all Spanning trees of a graph – Spanning trees in a weighted graph.
- Unit-IV** Cut- sets: Properties- Cut- Sets in a graph- Fundamental circuits and cut-sets-Connectivity and Separability. Planar graph and dual of a planar graph.
- Unit V** Matrix representation of graphs: Incidence matrix- Submatrices- Circuit matrix, path matrix- Adjacency matrix. Directed graphs: Types- Paths and Connectedness- Euler Digraphs- Matrices of Diagraphs: Adjacency, incidence, submatrices. Circuit and paths: Submatrices – Circuit matrix, path matrix.

Treatment as in :

1. Narasingh Deo – Graph Theory with applications to engineering and Computer Science, Prentice Hall, 1974.

Unit I : Chapter 1-1.1-1.5, 2.1-2.2, 2.4-2.6

Unit II : Chapter 2- 2.9, 2.10

Unit III : Chapter 3-3.1-3.10

Unit IV : Chapter 4-4.1-4.8

Unit V : Chapter 7-7.1-7.3, 7.8, 7.9 and Chapter 9-9.1, 9.2, 9.4, 9.5, 9.8, 9.9

2. Choudum, S.A – “First Course in Graph Theory”, Macmillan India Ltd.

Unit II : Chapter 3-3.1, 3.2 and Chapter 6-6.1 to 6.3

Unit IV : Chapter 5-5.1 to 5.5

Reference

1. "Invitation to Graph Theory" by S. Arumugam and S. Ramachandran SCITECH Publications.

2. "Graph theory and its applications" by B. Suriyanarayana and G.K. Ranganath" S. Chand and Company Ltd. New Delhi.

Semester V - Diploma Course

Subject title: Diploma in Operations Research – Paper III - Credit hours: 3

Subject Description:

This course presents applications and method to solve Integer Programming Problems, Non-linear Programming Problems and Dynamic Programming problems. It also includes Markov Analysis and Decision Analysis.

Unit I:

Integer Programming Problem – Gomory's fractional cut Method – Branch and Bound Method.

Unit II:

Non-linear Programming Problems – General NLPP – Lagrange multiplier – Hessian bordered Matrix – Kuhn Tucker Condition – Problems

Unit III:

Dynamic Programming Problem – Recursive equation approach – D.P.P Algorithm – Solution of L.P.P by D.P.P.

Unit IV:

Markov Analysis – Stochastic process – Markov analysis Algorithm.

Unit V:

Decision Analysis – Decision Making environment – Decisions under uncertainty – Decision under risk – Decision – Tree Analysis.

References:

1. Operations Research – Prem Kumar Gupta D. S. Hira, S. Chand & Company Ltd, Ram Nagar, New Delhi
2. Operations Research – Kandiswarup, P. K. Gupta, Man Mohan, S. Chand & Sons Education Publications, New Delhi, 12th Revised edition.
3. Operations Research Principles and Problems: S. Dharani Venkata Krishnan, Keerthi publishing house PVT Ltd

SEMESTER VI - PAPER XI COMPLEX ANALYSIS

Objectives

- to understand the important concepts such as continuity, differentiability and analyticity of a complex function
- to know the application of residues

Unit I Complex functions : Limit of a function , continuity of a function – Differentiability and analyticity of a function – Necessary and sufficient condition for differentiability – C.R. equation in polar coordinates – Complex function as a function of z and \bar{z}

Unit II Power series – Exponential , Logarithmic , Trigonometric and Hyperbolic functions, Harmonic function .

Unit III Elementary transformation – Bilinear transformation , Transformation $w = z^{1/2}$, $w = z^2$, $w = e^z$, $w = \sin z$, $w = \cos z$, conformal mapping.

Unit IV Complex integration .

Unit V Taylor's series , Laurent's series , Singularities , Residues, Real definite integrals (Type I and Type II).

Treatment as in:

Complex Analysis by P Duraipandian, Laxmi Duraipandian and D.Muhilan.

Unit I: Chapter 4.1 – 4.3, 4.5 – 4.9

Unit II: Chapter 6.1 – 6.12

Unit III: Chapter 2.6, 7.1, 7.4 – 7.8

Unit IV: Chapter 8.2 – 8.6 , 8.7 (Omit proof of Goursat's lemma and Cauchy's theorem)

8.9 (Omit proof of integral formula for n^{th} derivative) , 8.10, 8.11 (till theorem 8.17)

Unit V: Chapter 9.1 – 9.3, 9.5 – 9.12, 10.1 – 10.3 (omit Type 3 and Type 4)

10.4 (omit problems in Type 3 and Type 4)

Reference

1. Theory of functions of a Complex Variable , Santhi Narayanan, S.Chand & Co , New Delhi.
2. Elements of Complex Analysis, Choudhary.B, Wiley Eastern Pvt Ltd.

SEMESTER VI - PAPER XII REAL ANALYSIS

Objectives

- to have a knowledge about limit and continuity which are indispensable to the study of subjects such as optimization theory.
- to study the functional relationships between the variables which have more applications in expressing the laws of Physics , Chemistry , Mechanics etc.

Unit I Elements of point set topology: Euclidean space \mathbb{R}^n –open balls and open sets in \mathbb{R}^n , The structure of open sets in \mathbb{R}^n -closed sets and adherent points-The Bolzano-Weierstrass theorem, The Cantor intersection theorem, Lindelof Covering theorem - Heine-Borel theorem-Compactness in \mathbb{R}^n .

Unit II Metric spaces, point set topology in metric spaces, Compact subsets of a metric spaces-Boundary of a set-Convergent sequences- Cauchy sequences-Complete metric space .

Unit III Limit of a function, Continuous function-Continuity of composite function- Examples of continuous functions-Continuity and Inverse image of open and closed sets-Function continuous on compact sets-Uniform continuity- Uniform continuity and compact sets. Fixed point theorem

Unit IV Definition of derivative-Derivatives and continuity-Algebra of derivatives-Chain rule-One sided derivatives and infinite derivatives –functions with nonzero derivative-Zero derivative and Local Extrema- Rolle’s theorem-Mean value theorem for derivatives-Intermediate value theorem for derivatives

Unit V The Riemann –Stieltjes integral-Definition – Linear properties – Integration by parts-Change of variables-Reduction to Riemann integral.

Treatment as in

"Mathematical Analysis" by TOM.M.APOSTOL.

Unit I : 3.1 to 3.12

Unit II : 3.13 to 4.4

Unit III : 4.5, 4.8-4.9, 4.11-4.13, 4.19-4.20, 4.21

Unit IV : 5.1-5.10, 5.11

Unit V : 7.1-7.7

References

- 1.Elements of Real Analysis – Shanthi Narayanan, S Chand and Co, New Delhi
- 2.An Introduction to Real Analysis – PK Jain, and SK Kaushik, S Chand and Co, New Delhi
- 3.Real Analysis, Royden HL,Macmillan Publishing company, NewYork.
- 4.Real Analysis, Sharma JN and Vasistha ,Krishna Prakashan Mandir.
- 5.Real Analysis,Golden Maths series,Laxmi Publications,New Delhi.

SEMESTER VI - PAPER XIII PROGRAMMING IN C++ (THEORY)

Objective

- To enable the students to learn the language and help them to write Programs

- Unit I** Object oriented programming paradigm - Basic concepts of Object Oriented programming - What is C++ - A simple C++ program - More C++ Statements - An example with ass - Structure of C++ Program - Creating the source File compiling and linking introduction - Tokens - keywords - identifiers - Basic Data types - User Defined Data Types.
- Unit II** Derived data types - Symbolic constants - Type compatibility - Declaration of variables - operators in C++ - Scope resolution operators - Manipulators - Control structures - Introduction - The main function - Function Prototyping - Return by Reference - Inline functions - Default arguments - Constant arguments - Functions overloading - Friend and Virtual functions.
- Unit III** C structures revised - Specifying a class - Defining member functions A C++ program with class - Making outside function inline - Listing of member function - Private member function - Arrays within a class - Memory allocation for objects - Static member functions - Array of Objects - Objects as functions arguments - Friendly functions - Returning objects.
- Unit IV** Introduction - Constructors - Parameterized Constructors - Multiple Constructors in a class - Constructors with default arguments - Destructors Defining operator overloading - Overloading unary operators - Overloading binary operators - Manipulation of strings using operators - Rules for overloading operators - Type conversions.
- Unit V** Introduction - defining derived class - Inheritance - Making a private member inheritable - Multilevel inheritance - Hierarchical inheritance Hybrid inheritance.

Treatment as in

**“ Object oriented programming with C++ “ by E. Balagurusamay
Tata McGraw Hill publishing company Ltd.**

Unit I : Sec 1.4,1.5,2.1-2.8 3.1-3.6

Unit II Sec 3.7 -3.10, 3.13, 3.14, 3.17, 3.22, 4.1-4.10 (omit 4.4)

Unit III: Sec 5.12 - 5.16

Unit IV: Sec 6.1 - 6.5, 6.10, 7.2 -7.8 (omit 7.5)

Unit V: Sec 8.1 - 8.8

References

1. Bjarne Stroustrup –“ The C++ Programming language”, 2nd Edition , Addison Wesley. 1991.
2. John R. Hubbard –‘Programming with C++’, Tata Mc Graw Hill Publishing Company limited, New Delhi.

PROGRAMMING IN C ++ - PRACTICAL

- a. Program to matrix addition, subtraction, multiplication and transpose.
- b. Program to find the inverse of a matrix by Gauss elimination method
- c. Program to find mean and standard deviation of the given set of numbers
- d. Program to solve the quadratic equation and print all the roots
- e. Program for numerical integration by Simpson’s rule
- f. Program to solve differential equation by modified Euler method
- g. (i) Program to find the factorial of a given number
(ii) Program to implement the concept of inheritance
- h. Program to arrange the set of strings in alphabetical order.

Semester VI - Diploma Course

SUBJECT TITLE; OPERATION RESEARCH – Paper IV

PROJECT AND VIVA-VOCE:

PROJECT AREAS (BROAD FIELD)

1. Linear Programming Problems
2. Transportation Problems.
3. Assignment Problems
4. Inventory Control.
5. Queuing Models
6. PERT
7. Stochastic Process
8. Decision Analysis.

ELECTIVE I – A. MATHEMATICAL MODELING

Objective

- to develop mathematical models for problems in different disciplines and to solve them through mathematical techniques

Unit – I Mathematical Modeling Through Ordinary Differential Equation of First Order: Mathematical Modeling Through Differential Equations- Linear Growth and Decay Models-Non –Linear Growth and Decay Models- Compartment Models- Mathematical Modeling in Dynamics Through Ordinary Differential Equation of First Order

Unit – II Mathematical Modeling Through systems of Ordinary Differential Equation of First Order: Mathematical Modeling in population Dynamics- Mathematical Modeling of Epidemics Through systems of Ordinary Differential Equations- of First Order. Compartment Models Through systems of Ordinary Differential Equations- Mathematical Modeling in Economics Through systems of Ordinary Differential Equation of First Order.

Unit- III Mathematical Modeling Through Ordinary Differential Equations of second Order: Mathematical Modeling of planetary motions- Mathematical Modeling of Circular motion and motion of Satellites- Mathematical Modeling Through Linear Differential Equation of second Order

Unit- IV Mathematical Modeling Through Difference Equations:
The need for Mathematical Modeling Through Ordinary Differential Equation of First Order Mathematical Modeling Through Differencetials: Some simple Models-Basic theory of Linear Difference Equations with constant coefficients- Mathematical Modeling Through Difference Equations in Economic and finance

Unit –V Mathematical Modeling Through Partial Differential Equations: Situations giving rise to Partial differential equations Models-Mass balance equations: First method of getting PDE Models-Momentum-Balance Equation : The Second method of Obtaining Partial Differential Equation Models.- Model for Traffic Flow on a Highway.

Treatment as in

“Mathematical Modeling” by J N Kapur Wiley Eastern Ltd

Reference

First Course in Mathematical Modeling by frank .R. Giordano., Maurice D.Weir., William P Fox(Third Edition) Vikas Publishing House.

ELECTIVE PAPER I – B : MATHEMATICS IN FINANCE AND INSURANCE

Objectives

- to equip the students with the knowledge of applications of mathematics in Finance and Insurance..

- Unit I** Financial statement Analysis: Ratio Analysis : Meaning and objectives of financial statement analysis- ratio Analysis – Types of ratios – Liquidity ratios – Leverage/ Capital structure ratios- Profitability ratios – Profitability ratios related to sales – Profitability ratios related to investments – Return on Investments(ROI) – Activity Ratios – Importance of ratio analysis.
Book 1: Chapter 4
- Unit II** Introduction : Meaning of capital budgeting – Rationale of capital expenditure – Kinds of capital budgeting decisions – Data Requirement – Identifying relevant cash flows: Cash outflow estimates- Cash inflow estimates. Capital budgeting: Methods of Appraisal : Traditional techniques Discounted cash flow or time adjusted techniques – NPV and IRR methods.
Book 1 : Chapters 5,6
- Unit III** Annuities Certain, present values, Amounts, Deferred annuities , perpetuities, Redemption of loans: Present value of an immediate annuity certain- Accumulated value of a deferred Annuity certain- Present value of an Annuity Due of 1 p.a for a term of n years certain- The Accumulated value of an Annuity Due of 1 p.a for a term of n years certain at the end of n years- The accumulated value of deferred annuity due of 1% p.a for a term of n years certain at the end of n years, the deferment period being n years – Perpetuity – Present value of an Immediate perpetuity of 1p.a – Present value of a perpetuity Due of 1 p.a – Deferred Perpetuity with deferment period of m years. Mortality table: Column I – Column d – Column q – Column p – The probabilities of survival and death.
Book 2 : Lesson II (Sections 1- 27) Lesson V (Sections 1-7)
- Unit IV** Life Assurance Premiums : General Considerations
Assurance Benefits : Pure Endowment Assurance – Temporary assurance or term assurance – whole life assurance – Endowment Assurance – Double Endowment assurance – Increasing temporary Assurance – Increasing Whole life Assurance – Commutation functions D, C, M and R – Expressions for present Values of assurance Benefits in terms of commutation functions – Fixed term (Marriage) Endowment – Educational Annuity Plan.
Book 2 : Lesson VIII Lesson IX(Sections 1- 19)

Unit V Premium Conversion tables: Single Premium Conversion tables – Annual Premium conversion tables.
Policy Values : Two kinds of policy values – Policy Value in symbols – Calculation of policy Value for unit sum assured – Numerical example Retrospective method and comparison with Prospective plan – Derivation of theoretical expressions for policy value, V by the Retrospective Method and the prospective Method – Other expressions for Policy Value – Surrender Values – Paid up Policies – Alteration of Policy Contracts.
Book 2 : Lesson XIII (Sections 1 – 6) Lesson XV (Sections 1 – 10)

Treatment as in

1. **M.Y. Khan and P.K Jain, Financial management tata Mc graw – Hill Publishing Company Ltd, New Delhi, 1990.**
2. **Mathematical Basis of life Assurance , Insurance Institute Of India, July 2002, Reprint.**

References

1. Aswath Damodaran, Corporate Finance , Theory and Practice, John Wiley and Sons, Inc.
2. Prasanna Chandra , Managing Investment Tata McGraw - Hill Publishing Company Ltd, New Delhi, 1998.
3. Thomas Mikosch , Non life insurance Mathrmatics , Universitext, Springer

ELECTIVE I - C

SUBJECT TITLE: ASTRONOMY – I

Subject Description : This course focuses on the Solar system, Celestial sphere, Dip-Twilight

Goal: To enable the students to understand the Astronomical aspects and about the laws governing the planet movements.

Objectives: On successful completion of this course the students should gain knowledge about Astronomy.

UNIT I:

General description of the Solar system. Comets and meteorites – Spherical trigonometry.

UNIT II:

Celestial sphere – Celestial co – ordinates – Diurnal motion – Variation in length of the day.

UNIT III:

Dip – Twilight – Geocentric parallex.

UNIT IV:

Refraction – Tangent formula – Cassinis formula.

UNIT V:

Kepler's laws – Relation between true eccentric and mean anomalies.

Treatment as in "ASTRONOMY" by S.Kumaravelu and Susheela Kumaravelu.
Question paper setters to confine to the above text book only.

ELECTIVE II - A

Subject Title: ASTRONOMY II

Subject Description:

This course focuses on the Time, Annual Parallax, Precession, Nutation and The Moon, Eclipses.

Goal: To enable the students to learn about the interesting facts of Moon, Sun Planetary Motion.

Objectives: On successful completion of this course the students should gain knowledge about Astronomy.

UNIT-I:

Time: Equation of time – Conversion of time – Seasons – Calendar.

UNIT-II:

Annual Parallax – Abberation.

UNIT-III:

Precession – Nutation.

UNIT-IV:

The Moon – Eclipses.

UNIT-V:

Planetary Phenomenon – The Stellar system.

Treatment as in "ASTRONOMY" by Mr.S.Kumaravelu and Susheela Kumaravelu.
Question paper setters to confine to the above text book only.

ELECTIVE II – B : FUZZY LOGIC AND NEURAL NETWORKS

Objectives

- to introduce the concept of soft computing to the students.
- to take up research projects in these areas.
- to enable the students to apply the soft computing methodologies in their fields of work

Fuzzy Logic

Unit I Fuzzy set theory: Fuzzy versus crisp- Crisp sets: Operations on crisp sets – Properties of crisp sets – Partition and covering .Fuzzy sets: Membership function basic fuzzy set operations – Properties of fuzzy sets.Crisp relations: Cartesian product – Other crisp relations –Operations on fuzzy relations. Fuzzy relations: Fuzzy Cartesian product – Operations on fuzzy relations.

Unit II Fuzzy systems: Crisp Logic: Laws of propositional Logic- Inference in propositional Logic. Predicate Logic : Interpretations of Predicate Logic formula – Inference in predicate Logic . Fuzzy logic : Fuzzy Quantifiers – Fuzzy inference – Fuzzy rule based System – Defuzzification Methods – Applications.

Unit III Fuzzy Associative Memories : FAM an introduction – Single Association FAM: Graphical method of inference – Correlation Matrix Encoding . Fuzzy Hebb FAMS- FAM involving a rule base – FAM Rules with multiple Antecedents / Consequents: Decomposition rules. Applications.

Neural Networks

Unit IV Fundamentals Of Neural Network: Basic Concepts of Neural Networks – Human Brain – Model of an Artificial Neuron – Neural Network Architectures: Single Layer FeedForward Network – Mutlilayer Feed forward Network – Recurrent Networks .Characteristic of neural Networks – Learning Methods – Taxonomy of neural Network Architectures – History of neural Network Research – Early neural Network Architectures – Rosenblatt’s perceptron – ADALINE network – MADALINE Network – Some Application Domains.

Unit V Back Propagation Networks: Architecture of a Back Propagation Network: The perceptron Model – The solution – Single Layer Artificial Neural Network. Model for Multi Perceptron .Bank propogation Learning : Input Layer computation – Hidden Layer Computation Output Layer Computation – Calculation of Error – Training of neural network – Method of steepest Descent – Effect of learning Rate η - Adding a Momentum Term – Back Propogation Algorithm.

Treatment as in

S.Rajasekaran, G.A. Vijayalakshmi Pai, “Neural Networks, Fuzzy Logic and Genetic Algorithms – Synthesis and Applications “, Prentice Hall of India Pvt. Ltd., New Delhi,2003.

Unit I : Chapter 6 Unit II: Chapter 7

Unit III : Chapter 14 Unit IV : Chapter 2

Unit V: Chapter 3(Sections 3.1,3.2)

Reference

- 1.Timothy J. Ross fuzzy Logic with Engineering Applications , McGraw Hill , 1997.
2. Dr.Valluru.B.Rao, Hayagriva,V.Rao.C++ Neural Networks And Fuzzy Logic, BPB Publications , Second Edition, 1996

ELECTIVE II- C : JAVA PROGRAMMING

Objectives

- to enable the student to develop Internet Based Applications.
- to develop the programming skills in server side and GUI applications.

Unit I Java Evolution – history – features – how java differs from c & c++ - Java & Internet – Java & www – web browsers. Overview of java language: Introduction – simple java program – Structures – java tokens- statements – java virtual machine.

Unit II Constants – Variables – data types – operators and expressions – decision making and branching: if, if else, else if ladder, switch, conditional operator. Decision making and looping: While, Do, for, jumps and loops, labeled loops. Class objects and methods.

Unit III Arrays, Strings and vectors, interfaces, multiple inheritances, packages: putting classes together – multi threaded programming.

Unit IV Managing errors and exceptions – applet programming - graphics programming

Unit V Files: Introduction – Concepts of stream – Stream classes – using streams – I/O classes, file classes, I/O exceptions – creation of files – reading/writing character / bytes – handling primitive data types – random access files.

Treatment as in

“ Programming with java “ by E.Balagurusamy

References

- 1.“The Complete Reference – Java tool” - Patrick Naughton and Herbert Schildt, Tata Mc Graw –Hill Publishing Company Limited, New Delhi.
2. Java handbook - Patrick Naughton and Herbert Schildt, Tata Mc Graw –Hill Publishing Company Limited, New Delhi.

ELECTIVE PAPERS III – A : COMBINATORICS

Objectives

- to introduce a branch of Discrete Mathematics that deals with enumeration and existence problems.
- to enable the students to attempt questions related to enumeration in various competitive examinations.

- Unit I** Basic Combinatorial numbers – Striling numbers of the second kind
- Unit II** Generating functions and Recurrence relations- symmetric functions.
- Unit III** Multinomials – multinomial theorem – Inclusion and Exclusion principle
- Unit IV** Euler function – Permutations with forbidden positions – The “ Menage” problem – Problem of Fibonacci.
- Unit V** Polya Theory – Necklace problem and Burnside’s lemma – Cycle index of a permutation group – Polya’s theorems and their immediate applications.

Treatment as in

**“Combinatorics Theory and Applications”, by Krishnamurthy. V
East –West Press.**

References

1. V.k.Balakrishnan – Theory and Problems of combinatorics – Schaums outline series – Mcgraw Hill.
2. Inn Anderson – Combinatorics of finite sets – Oxford Science Publication.
3. Kenneth P.Boggart – Introductory Combinatorics – Pitman Books Ltd.

ELECTIVE III - B

AUTOMATA THEORY AND FORMAL LANGUAGES

UNIT – I

Introduction – phrase structure languages.

UNIT – II

Closure operations.

UNIT – III

Context free languages.

UNIT – IV

Finite state automata.

UNIT – V

Push down automata.

Content and treatment as in, 'Formal Languages and Automata' by Rani Sriomoney. Revised edition 1984. Pulished by the Christian Literary Society, Madras-3 Chapters 1 to 6.

Reference Books:

1. Hopcrot and still man-Formal languages and their relation automata-Addision Wesley.
2. R.Y.Kulin-Automata theory-Machines and Languages-McGraw Hill.

ELECTIVE III – C : RDBMS & ORACLE

Objectives

- to provide necessary fundamentals to work with a database.
- to develop the competence in working with the database.
- to enable the students applications software using oracle and RDBMS

Unit I Introduction: Purpose of database systems-view of data-data models-database languages-transaction management-Storage management-database administrator-database users-system structure.Entity: relationship model: Basic concepts-Keys-Entity-Relationship diagram-Weak entity sets-E-R Features. Specialization, Generalization.
Relational Model: Structure of Relational Databases-Relational Algebra-Views.

Unit II SQL: Background-Basic structure-Set Operators-Aggregate functions-null values-Nested sub-queries-Derived relations-Views-Modification of the database-Joined relations-data definition language-Embedded SQL features.

Unit III Integrity Constraints: Domain constraints: Domain Constraints-Referential Integrity-Assertions-Triggers-Functional dependencies.
Relational Database design: Pitfalls-Normalization.
Object oriented Databases: New Database Applications-Object oriented Data model;-Object oriented languages-Persistent programming languages.

Unit IV Object Relational Databases: Nested Relations-complex types & Object orientation-Querying with complex data types-creation of complex values & objects-Comparison of object oriented Relational databases.

Unit V New Applications: Decision support systems-Data Analysis-Data Mining-Data Warehousing-Spatial & Geographic Databases-Multimedia databases-Mobility & personal databases-Information- Retrieval systems-Distributed information systems-The World Wide Web.

Treatment as in

Abraham Silberschatz, Henry F Korth, S.Sudharshan—“Database System Concepts”—Tata Mc Graw Hill International Eds(1997)