

BHARATHIAR UNIVERSITY::COIMBATORE-641 046
B. Sc. MATHEMATICS WITH COMPUTER APPLICATIONS
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 - Classical Algebra		4	3	25	75	100	4
III	Core Paper II-Calculus		5	3	25	75	100	4
III	Allied A : Paper I Statistics - I		7	3	25	75	100	5
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 Analytical Geometry		4	3	25	75	100	4
III	Core Paper IV - MS-Office (Theory)		5	3	20	55	75	4
	MS-Office (Lab)			3	10	15	25	
III	Allied A: Paper II Statistics - II		7	3	25	75	100	5
IV	Value Education – Human Rights #		2	3	-	50	50	2
Semester III								
III	Core Paper V- Trigonometry, Vector Calculus&Fourier Series		6	3	25	75	100	4
III	Core Paper VI- Mechancis		6	3	25	75	100	4
III	Core Paper VII- C- Programming		6	3	25	75	100	4
III	Allied B - Paper I Physics I/ Chemistry I (or) Acc. I		5	3	20	55	75	4
			7	3	25	75	100	5
III	Allied Practical		2	-	-	-	-	-
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							
III	Core Paper VIII- Differential Equation&Laplace Transform	5	3	25	75	100	4
III	Core Paper IX- RDBMS & Oracle	5	3	25	75	100	4
III	Core Paper X- - C++ Programming	5	3	25	75	100	4
III	Allied B - Paper I Physics II / Chemistry II (or) Acc. II	5	3	20	55	75	4
		7	3	25	75	100	5
III	Allied Practical	2	3	20	30	50	2
III	Core Paper XI - Lab: C, C++, RDBMS	3	3	40	60	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 XII-Real Analysis	5	3	25	75	100	4
III	Core Paper XIII- Modern Algebra	5	3	25	75	100	4
III	Core Paper XIV- Visual Basic	5	3	25	75	100	4
III	Core Paper XV- Discrete Maths	6	3	25	75	100	4
III	Elective I	6	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 XVI Complex Analysis	5	3	25	75	100	4
III	Core Paper XVII Internet & Java	5	3	25	75	100	4
III	Elective II	6	3	25	75	100	5
III	Elective III	6	3	25	75	100	5
III	Core Paper XVIII Lab: Internet Java & Visual Basic	5	3	40	60	100	4
IV	Skill Based Subject 4 Diploma in Operations Research – Project *	-	-	-	-	100*	3
V	Extension Activities @	-	-	50	-	50	1
Total						3600	140

* Project : Viva-voce : 20; Report : 80

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

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Allied subjects : 1.Physics, 2.Chemistry, 3.Accountancy & 4.Statistics.

List of Elective papers (Colleges can choose any one of the paper as electives)							
Elective – I	A	Astronomy- I					
	B	Numerical Methods-I					
	C	Graph Theory					
Elective – II	A	Astronomy- II					
	B	Numerical Methods-II					
	C	Digital Electronics and Computer Fundamentals					
Elective - III	A	Automata Theory & Formal Languages					
	B	Fuzzy logic and Neural Networks					
	C	Internet and Web Design	Theory		20	55	100
Practical			-	-	10	15	

B.Sc (MATHEMATICS WITH COMPUTER APPLICATIONS)
Semester: I Core Paper –I

Subject title: Classical Algebra

Credit hours-4

Subject Description: This course focuses on the convergence and divergence of different types of series also discusses the standard methods of solving both polynomial and transcendental type equations.

Goal: To enable the students to learn about the convergence and divergence of the series and to find the roots for the different types of the equation.

Objectives: On successful completion of this course the students should gain knowledge about the convergence of series and solving equations.

UNIT I:

Binomial, exponential theorems-their statements and proofs – their immediate application to summation and approximation only.

UNIT II:

Logarithmic series theorem-statement and proof-immediate application to summation and approximation only. Convergency and divergency of series -definitions, elementary results-comparison tests- De Alemberts and Cauchy's tests.

UNIT III:

Absolute convergence-series of positive terms-Cauchy's condensation test-Raabe's test.

UNIT IV:

Theory of equations: Roots of an equation- Relations connecting the roots and coefficients- transformations of equations-character and position of roots-Descarte's rule of signs-symmetric function of roots-Reciprocal equations.

UNIT V:

Multiple roots-Rolle's theorem - position of real roots of $f(x)=0$ – Newton's method of approximation to a root – Horner's method.

Treatment as in

Algebra-T.K.Manicavachasam Pillai, T.Natarajan, K-S Canapathy,
S.Viswanatham (Printers & Publishers Private Ltd-2006)

Reference:

1. Mathematics for B.Sc. Branch I – Vol.I – P.Kandasamy and K.Thilagavathy (For B.Sc-I semester) S.Chand and Company Ltd, New Delhi, 2004.
2. Algebra. –N.P.Bali- Laxmi publications.

Semester: I Core Paper –II

Subject title: CALCULUS

Credit hours-5

Subject description:

This course presents the idea of curvatures, integration of different types of functions, its geometrical applications, double, triple integrals and improper integrals.

Goal:

To enable the students to learn and gain knowledge about curvatures, integrations and its geometrical applications.

Objectives:

On successful completion of course the students should have gain about the evolutes and envelopes, different types of integrations, its geometrical application, proper and improper integration.

UNIT I:

Curvature-radius of curvature in Cartesian and polar forms-evolutes and envelopes-pedal equations-total differentiation-Euler's theorem of homogeneous functions.

UNIT II:

Integration of $f'(x)/f(x)$, $f'(x)\sqrt{f(x)}$, $(px+q)/\sqrt{ax^2+bx+c}$, $[\sqrt{(x-a)/(b-x)}]$, $[\sqrt{(x-a)(b-x)}]$, $1/[\sqrt{(x-a)(b-x)}]$, $1/(\cos x + b \sin x + c)$, $1/(\cos^2 x + b \sin^2 x + c)$, Integration by parts

Unit III:

Reduction formulae-problems-evaluation of double and triple integrals-applications to calculations of areas and volumes-areas in polar coordinates.

UNIT IV:

Change of order of integration in double integral-Jacobions.- change of variables in double and triple integrals.

UNIT V:

Notion of improper integrals, their convergence, simple tests for convergence simple problems, Beta and Gamma Integrals-their properties, relation between them-evaluation of multiple integrals using Beta and Gamma functions.

Treatment as in

1. Calculus vol 1 and 2" –S.Narayanan and T.K.M.Pillai. Viswanathan Publishers.

Reference:

1. Mathematics for BSc – Vol I and, II-P.Kandasamy & K.Thilagavathy S.Chand and Co-2004.
2. A Text book of calculus- Shanthi Narayanan & J.N.Kapoor, S.Chand & Co.

Semester: II Core Paper –III

Subject title: ANALYTICAL GEOMETRY

Credit hours-4

Subject Description:

This course gives emphasis to enhance student knowledge in two dimensional and three dimensional analytical geometry. Particularly about two dimensional conic sections in polar coordinates and the geometrical aspects of three dimensional figs, viz, sphere, cone and cylinder.

Goal:

To enable the students to learn and visualize the fundamental ideas about co-ordinate geometry.

UNIT- I:

Analytical geometry of two dimensions :- Polar coordinates Equation of a conic-directrix-chord-tangent-normal-simple problems.

UNIT –II:

Analytical geometry of three dimensions:-Straight lines-Coplanarity of st.lines- Shortest distance (S.D) and Equation of S.D between two lines-simple problems.

UNIT –III:

SPHERE: Standard equation of sphere –results based on the properties of a sphere-Tangent plane to a sphere – Equations of a circle.

UNIT –IV:

CONE AND CYLINDER:- cone whose vertex is at the origen-enveloping cone of a sphere-right circular cone-equation of a cylinder-right circular cylinder.

UNIT –V:

CONICOIDS:-Nature of a conicoid-Standard equation of a central conicoid- Enveloping cone-Tangent plane – conditions for tangency –Director sphere and Director plane.

Treatment as in

1. Analytical Geometry by P.Durai Pandian & others.
2. Solid Geometry by N.P.Bali-Laxmi Publications (P)Ltd.

Reference:

1. Analytical Geometry of 2D by T.K.M.Pillai and Others –Visvanathan Publications -2006.
2. Solid Geometry by M.L.Khanna-Jainath & Co Publishers, Meerut.

Semester: II Core Paper -IV

Subject title: MS-office & Lab

Credit hours-5

Subject Description: This paper presents the overview of word processing, document creation and editing, keyword shortcuts, excel introduction, charts, problems in it, access introduction, database creation, table manipulations, reports, problems, power point overview, clipart, sounds, animation and application problems.

Goals: To enable the students to study about the word, document writing facilities, doing calculations using excel, database creation and manipulations over it using access & power point presentations.

Objectives:

On successful completion of the course the students should have:

Learnt the document writing using word

Learnt the calculations using excel

Learnt the creation and manipulation of tables using access

Learnt the power point slide shows.

UNIT I:

Microsoft Word: Word processing overview-creating and editing documents-formatting documents – working with header, footer and footnotes.

UNIT II:

Creating report and news letter –creating table and merging document- creating web page-macros-keyboard shortcuts-menus-customs toolbars.

UNIT III:

Microsoft Excel: Spreadsheet overview-creating worksheet-managing and analyzing complex worksheet –creating charts creating form template-sharing data between application.

UNIT IV:

Microsoft Access: Database overview-creating database-modifying table and creating form-filtering and querying tables-creating reports and mailing labels- sharing information between applications.

UNIT V:

Microsoft PowerPoint: Basics –using text-adding visual elements –charts and tables-drawing-clipart-sounds-animation-apply time transitions to slides.

Treatment as in

Timothy J.O’Leary and Linda I.O’Leary, Microsoft Office 97’,IRWIN/McGraw Hill, 1998.

REFERENCE BOOK:-

MS-office 2000 woody Leon hard, practice-Hall of India private Limited 2000, New Delhi-110 001.

PRACTICAL LIST FOR MS-OFFICE

MS-Word

1. Illustrate the mail merge concept to apply for a suitable job for at least 5 companies.
2. Using MS-word perform the following:
Change the font size to 20
Change the font type to Garamond
Align the text to left, right, justify and center.
Underline the text.
Table manipulation.

MS-EXCEL

1. Built a worksheet to perform correlation and regression coefficient using formula and check the answer with built-in-functions.
2. Worksheet preparation for electricity bill preparation.
3. Draw graphs to illustrate class performance.

MS-Power Point

4. Prepare an organization chart for a college environment in PowerPoint.
5. Perform frame movement by inserting clipart to illustrate running of a car automatically.
6. Prepare a Power Point presentation with all the slide translation facilities.

MS-Access

7. Perform sorting on name, place and pin code of students database and list them in the sorted order.
8. Using queries retrieve information from sales database which contains Trans-no, date, prod-id, prod-name qty, unit-price and region. List out records region wise, date-wise, product-wise.
 9. Create mailing labels for employee database.

Semester: III Core Paper -V

SUBJECT TITLE: Trigonometry, Vector Calculus and Fourier Series

UNIT –I:

Expansion of $\cos n\phi$, $\sin n\phi$, $\cos^n \phi$, $\sin^n \phi$ – Hyperbolic functions – Separations 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-II:

Logarithm of a complex number-Summation of trigonometric Series.

UNIT-III:

Scalar and vector point functions-Differentiation of vectors-Differential operators – Directional derivative, gradient, Divergence, Curl.

UNIT-IV:

Integration for vectors: Line, Surface and Volume integrals, Theorems of Gauss, Green, Stokes (Statements only) – Verifications.

UNIT-V:

Fourier Series: Definition – Finding Fourier coefficients for a given periodic function with period 2π -Odd and even functions – Half range series – change of interval.

Treatment as in ‘Trigonometry’ by Narayanan and T K M

Vector calculus by P.Duraipandian

Fourier series by S.Narayanan

Question paper setters to confine to the above text books only.

Reference:

**Mathematics, Volume IV (Vector Calculus, Fourier Series) by P.Kandasamy, K.Thilagavathy
Publishers S.Chand & Company Ltd., Ramnagar, NEW DELHI-110 055.**

Semester: III Core Paper –VI

Subject Title: Mechanics

STATICS

UNIT –I

Forces acting at a point – Parallelogram Law, Triangle Law, Polygonal Law- Lami's Theorem – Forces acting on a rigid body – Parallel forces – Moment of a force about a point – Varignon's Theorem on moments – couples – Resultant of coplanar couples – Resultant of a couple of a force.

UNIT II:

Three forces acting on a rigid body – Coplanar Forces – Reduction of any number of Coplanar Forces – condition for a system of forces to reduce to a single force or a couple – Condition of equilibrium – Simple problems- Friction – Laws of friction – Co-efficient of friction cone and angle of friction – Simple problems.

DYNAMICS

UNIT III:

Projectile: Part of a projectile – Greatest height – Time of flight – Range on an inclined plane through the point of projection – Maximum range.

UNIT IV:

Central Orbits – Differential equation of a central orbit in Polar coordination -Pedal equation –Velocity in a Central orbit & Finding the Law of force.

UNIT V:

SHM:Composition of two S.H.M of the same period in a stright line and in two perpendicular lines.

Impact on a fixed surface: Impulsive force, Impact on a smooth fixed plane. Direct and oblique impact of two smooth spheres.

Prescribed Text Book:

Dynamics Dr.M.K.Venkataram, Agasthiar Book Publication, Trichy
Statistics Dr.M.K.Venkataram, Agasthiar Book Publication, Trichy

Semester: III Core Paper –VII

Subject Title: C Programming

Subject Description: This paper presents the importance of c language, its structure, Data types, Operators of C, Various control statements, Arrays, different types of functions and practical problems.

Goals: To enable the students to learn about the basic structure, Statements, arrays, functions and various concepts of C language.

Objectives:

On successful completion of the course the students should have:

Learnt the basic structure, operators and statements of C language.

Learnt the decision making statements and to solve the problems based on it.

Learnt arrays, functions and solve the problems Regarding about it.

UNIT I:

Introduction – Importance of C Basic structure of c programme Character set- Constants – Keywords and identifiers – Variables Data types – Declaration of variables – Assigning values to variables –Defining symbolic constants.

UNIT II:

Arithmetic operators - Relational operators - logical operators – assignment operators –increment and decrement operates –Conditional operators – Special operators – Arithmetic expressions –Evaluation of expressions –Precedence of arithmetic operators – Some computational problems –Type conversion in expressions – operator precedence and associating mathematical functions.

UNIT III:

Reading and Writing character – formatted input and output. 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.The WHILE statement - the DO statement the FOR statement –Jumps in loops.

UNIT IV:

One, Two dimensional arrays – Initiating two dimensional arrays – Multidimensional arrays –Declaring and initializing string variables –reading strings from terminal – Writing strings on the screen – Arithmetic operations on characters.

UNIT V:

Pointers- understanding pointers –Accessing the address of a variable – Declaring and initializing pointers – Accessing a variable through its pointers – pointer expressions – Pointer increments and scale factor – Pointers and arrays – Pointers and functions void printers.

TEXT BOOK:

E.Balagurusamy “Programming in ANSI C” Second Edition – Tata McGraw –Hill Publishing company limited, New Delhi.

REFERENCE BOOKS:

Byron Gottfried “Programming with C”(Schaum’s outline series)-Tata McGrawHill publishing company -1998.

Ashok N.Kamthane “Programming with Ansi and Turbo C”, Pearson Education publishers,2002

Hentry Mullish and Herbert L cooper , “The spirit of C” Jaico publisher , 1996.

THE ANSI C, Second edition, October 1992.BRIAN W.KERNIGHAN,DENNIS M.RITCHIE

Published by Prentice- Hall of India Privated Limited, M-97,New Delhi- 110001.

.ANSI C:

With Microsoft C 5.1 and Quick C 2.0 C.Balasubramanian.1992, Tata McGraw-Hill Publishing company limited, New Delhi.

“PROGRAMMING IN C “, Kris A.Jamsa 1992 , Galgotia Publications Pvt.ltd.

Diploma Course : Semester III

Subject title: 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.
3. Operations Research Principles and Problems: S. Dharani Venkata Krishnan, Keerthi publishing house PVT Ltd.

Semester: IV Core Paper –VIII

Subject Title: Differential Equations and Laplace Transforms Credit Hours: 5

Subject Descriptions: This course presents the method of solving ordinary differential Equations of First Order and Second Order, Partial Differential equations. Also it deals with Laplace Transforms, its inverse and Application of Laplace Transform in solving First and Second Order Differential Equations with constant coefficients.

Goals: It enables the students to learn the method of solving Differential Equations.

Objectives: End of this course, the students should gain the knowledge about the method of solving Differential Equations. It also exposes Differential Equation as a powerful tool in solving problems in Physical and Social sciences.

Unit I:

Ordinary Differential Equations: Equations of First Order and of Degree Higher than one – Solvable for p , x , y – Clairaut's Equation – Simultaneous Differential Equations with constant coefficients of the form

i) $f_1(D)x + g_1(D)y = \phi_1(t)$

ii) $f_2(D)x + g_2(D)y = \phi_2(t)$

where f_1 , g_1 , f_2 and g_2 are rational functions $D = \frac{d}{dt}$ with constant coefficients ϕ_1 and ϕ_2

explicit
functions of t .

Unit II:

Finding the solution of Second and Higher Order with constant coefficients with Right Hand Side is of the form Ve^{ax} where V is a function of x – Euler's Homogeneous Linear Differential Equations – Method of variation of parameters.

Unit III:

Partial Differential Equations: Formation of equations by eliminating arbitrary constants and arbitrary functions – Solutions of P.D Equations – Solutions of Partial Differential Equations by direct integration – Methods to solve the first order P.D. Equations in the standard forms - Lagrange's Linear Equations.

Unit IV:

Laplace Transforms: Definition – Laplace Transforms of standard functions – Linearity property – Firsting Shifting Theorem – Transform of $tf(t)$, $\frac{f(t)}{t}$, $f'(t)$, $f^{(1)}(t)$.

Unit V:

Inverse Laplace Transforms – Applications to solutions of First Order and Second Order Differential Equations with constant coefficients.

Treatment as in

Kandasamy. P, Thilagavathi. K “Mathematics for B.Sc – Branch – I Volume III”, S. Chand and Company Ltd, New Delhi, 2004.

References:

- 1) S. Narayanan and T.K. Manickavasagam Pillai, Calculus, S. Viswanathan (Printers and Publishers) Pvt. Ltd, Chennai 1991
- 2) N.P. Bali, Differential Equations, Laxmi Publication Ltd, New Delhi, 2004
- 3) Dr. J. K. Goyal and K.P. Gupta, Laplace and Fourier Transforms, Pragali Prakashan Publishers, Meerut, 2000

Semester: IV Core Paper -IX

Subject Title: RDBMS AND ORACLE

CREDIT HOURS: 5

Subject Description:

This paper presents the basic concepts of DBMS, Keys, RDBMS, introduction to SQL, ORACLE data types, Queries in SQL, introduction to PL/SQL, its basic structure, triggers, basic concepts of forms, reports and practical problems.

Goals:

To enable the students to learn about the basic concepts of DBMS, RDBMS, SQL, PL/SQL, forms and Reports.

Objectives:

On successful completion of the course the students should have learnt the basic concepts of DBMS and RDBMS.
Learn to build a queries using SQL, PL/SQL.
Learnt to design a forms and reports using ORACLE Developer 2000.

UNIT –I:

Basic concepts of DBMS – Entities and their attribute Keys – Prime Keys, secondary keys, Super Keys, Candidate Keys, Alternative Keys - Examples, Relationship

– Records and files, Data independence, Views – Types of Views, Components of a DBMS, DDL, DML, DQL. Advantages and disadvantages of DBMS, RDBMS – Relational Database – Relations and their schemes –Relation representation – Integrity rules.

TEXT BOOKS:

For unit 1 treatment as in “Introduction to Database System” –BipinDesai [chapter 1,sections 4.2 and 6.5.1 and 6.5.2]

UNIT II:

Integrative SQL –invoking SQL plus, data manipulation in DBMS ,The ORACLE data types, two dimation matrix creation, Intersection of data into tables, data constrains, computation in expression lists used to select data, logical operation, Range searching, pattern matching, Orac’e function, Grouping data from tables in SQL , Manipulating dates on SQL,joins,subqueries.

UNIT III:

PL/SQL-Introduction ,The PL/SQL execution enviornment, the PL/SQL syntax, Understanding the PL/SQL Block structure,database triggers.

UNIT IV:

Working with forms, Basic concepts, Application development in forms, Form module, Blocks items, Canvas view windows, Creating a form Generating and running a form, Using the Layout editor ,Master form, Triggers, Data Navigation Via an Oracle form ,Master detail form, Creating a master detail form, Master detail data entry screen.

UNIT V:

Working with reports ,Defining a data model for report , specific the layout of a report,use the Oracle reports interface, Creating a default tabular report, Creating computed columns, Creating user parameter, Arranging the layout, Creating a Master / Detail report, Creating a matrix report.

TEXT BOOK:

For units 2, 3, 4, 5, treatment as in ‘Commercial application Development using Oracle developer 2000’ by IVAN BAYROSS.

Abraham Silbertschatz, Henry F Korth, S Sudharson, “Database system concepts”, TATA McGraw Hill International Edition-1997

REFERENCE:

1. Alex Leen and Mathews Leon, “Database Management Systems” - Vikas publications
2. Elmarsi Navathe, “Fundamentals of Database Systems” – Pearson Education Publications - Edition 3 -2001
3. Oracle 8& PL/SQL Black Book Mark Gokman, Jhonathan Ingraw,. 1998, Comdex Computer publication, New Delhi- 110002
4. Oracle 8 THE COMPLETE REFERENCE George Koch, Kevin Loney, Tata McGraw Hill Publications Ltd, New Delhi.

Semester: IV Core Paper –X

Subject Title: C+ + PROGRAMMING

CREDIT HOURS: 5

Subject Description:

This paper presents the importance of object oriented language, drawbacks of procedure oriented programming, OOPs concepts, class structure, operators, the types of inheritance & polymorphism, Files, Streams and Exception handling & templates.

Goals:

To enable the students to learn about the basic OOPs concepts, class structure, operators, inheritance, polymorphism, files, Exception handling and Templates.

Objectives:

On successful completion of the course the students should have learnt the drawbacks of Pop and Need for OOP &OOPs concepts
Learnt class structure, member functions & data members.
Learnt the concept of inheritance, types and example problems.
Learnt the concepts of polymorphism, types and problems.
Learnt files, streams and Exception handling & Templates with practical problems.

UNIT-I:

Evolution of programming languages- -drawbacks of classical methods- need for object orientation – conventional programming versus object oriented programming – properties – treatment of object, class and association of objects.

UNIT-II:

Object oriented design – object oriented database – object oriented user interface – garbage collection and exception handling, Evolution of C++ - C verses C++ - C++ programming basics - data type - include directories – loops and decisions - structures - functions.

UNIT-III:

Object and classes – messages – access specifier – data encapsulation definition and declaration of member functions – static class data – constructor and destructor – copy constructor – in line function – static data members and function – pointers and references – this pointer – strings – new and delete operators - object I/O streams.

UNIT-IV:

Polymorphism – operator overloading – function overloading –overloading unary operators – overloading binary operators – data conversion and pitfalls of operator overloading – friend function – friend class, single inheritance – multiple inheritance- inheritance access specifier - derived and base class – static and dynamic binding – virtual function – pure virtual function – virtual base class – abstract class.

UNIT-V:

Files and streams – string I/O – object I/O stream class – error handling – redirection – command line arguments – exception handling – container classes – templates – simple templates – list templates – function templates – templates arguments.

Text Books:

1. E.Balagurusamy ‘Object Oriented programming with C++’, McGraw Hill
2. Bjarne Stroustrup, ‘The C++ programming language’, II Edition, Addison Wesley, 1991.
3. Grady Booch, ‘Object Oriented Analysis and Design’ The Benjamin and Cummins publications, 1993.

Reference Books:

1. “Object Oriented Programming using C++”, S.K.Chadha, Amit Chadha Kalyani Publishers –New Delhi, 2001-2002.
2. “Object oriented programming in Turbo C++”,-Robert Lafore-Galgotia- publications Pvt.Ltd, New Delhi- 110002 11994.
3. Programming with C++-D.Ravi Chandran -1996, Tata McGraw- Hill publishing company limited, New Delhi.
4. Ashok N.Kamthane, “Object Oriented Programming with Ansi and Turbo C++”, Pearson Education publishers, 2003.
5. John R.Hubbard “Programming with C++”, 2nd Edition, TMH publishers,2002.

SEMESTER IV : Core Paper –XI - Lab C, C++ & RDBMS

C PROGRAMMING PRACTICAL LIST:

1. Write a C program to generate ‘N’ Fibonacci number.
2. Write a C program to print all possible roots for a given quadratic equation.
3. Write a C program to calculate the statistical values of mean, median, mode, Standard Deviation and variance of the given data
4. Write a C program to sort a set of numbers using the functions.
5. Write a C program to sort the given set of names and assign roll numbers.
6. Write a C program to search a required element in a list using binary search.
7. Write a C program to find factorial value of a given number ‘N’ using recursive function call.
8. Write a C program to find inverse and determinant of a given matrix.
9. Write a C program to find number of palindromes in a given sentence.
10. Write a C program to prepare pay list for a given data.
11. A file contains the name of students with their initials at the beginning . Write a program to read this file and write their names in another file with the initials at the end.
12. Convert a word star file into an ASCII file and store it another file.

C++ PROGRAMMING PRACTICAL LIST:

1. Create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the stack to 0. Write a member function PUSH(). To insert an element and a member function POP() to delete an element. Check for overflow and underflow conditions.
2. Create a class ARITH which consists of a FLOAT and an INTEGER variable . Write member functions ADD(), SUB(), MUL(), DIV(), MOD() to perform addition, multiplication, division, and modulus respectively. Write member functions to get and display values.
3. Create a class which consist of employee detail ENO,ENAME,DEPT,BASIC SALARY. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA,HRA and PF depending on the grade and display the PAY Slip in a neat format using console I/O.
4. Define two classes polar and rectangle to represent points in the polar and rectangle system.
Use conversion routines to convert from one system to another.
5. Create a class FLOAT that contains one float data member overload all the four arithmetic operators so that operate on the objects of FLOAT.

RDBMS PRACTICAL LIST:

1. Creating tables and writing simple queries using
 - a) Comparison operators
 - b) Logical Operators
 - c) Set operators
 - d) Sorting and Grouping
2. Writing Queries using built in functions
3. Creation of reports using column format
4. Updating and altering tables using SQL
5. Creation of students information table and write PL/SQL blocks find the total, average marks and results
6. Write a PL/SQL block to prepare the electricity bill
7. Write a PL/SQL to split the students information table in to two , one with the passed and other with failed
8. Write PL/SQL block to join two tables, first table contains the Roll no. and address.
9. Create a Database Trigger to check the data validity of record.

Diploma Course Semester IV

Subject title: 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 – Mante-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 Core Paper –XII

Subject Title: Real Analysis

Credit Hour:5

Subject Description:

This course focuses on the Real and Complex number systems, set theory, point set topology and metric spaces.

Goal:

To introduce the concepts which provide a strong base to understand and analysis mathematics.

Objective:

On successful completion of this course the students should gain the knowledge about real and complex numbers, sets and metric space.

UNIT-I

Least upper bound, greatest lower bound- the Cauchy schwarz inequalities – Countable and uncountable sets- Uncountability of the real number systems- Set Algebra – Countable collections of countable sets.

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.

UNIT II

Covering –Lindelof covering theorem –the Heine Borel covering theorem – Compactness in \mathbb{R}^n –Metric Spaces –point set topology in metric spaces –compact subsets of a metric space –Boundary of a set.

UNIT III

Convergent sequences in a metric space –Cauchy sequences –Completeness sequences –complete metric Spaces. Limit of a function –Continuous functions – continuity of composite functions. Continuous complex valued and vector valued functions – Examples of continuous functions - Continuity and inverse images of open or closed sets – functions continuous on compact sets – topological mappings – Bolzano's Theorem.

UNIT IV

Definition of derivative –Derivative and continuity –Algebra of derivatives – Roll's theorem –The mean value theorem for derivatives –Taylor's formula with remainder. Properties of monotonic functions –functions of bounded variation –total Variation –additive properties of total variation on (a, x) as a function of x – functions of bounded variation expressed as the difference of increasing functions –continuous functions of bounded variation.

UNIT V

The Riemann - Stieltjes integral : Introduction –Notation –The definition of Riemann –Stieltjes integral –linear properties –Integration by parts –change of variable in a Riemann –stieltjes integral –Reduction to a Riemann integral.

Treatment as in

Tom. M. APOSTOL, Mathematical Analysis, 2nd ed., Addison-Wisely. Narosa Publishing Company, Chennai, 1990.

References

1. R.R.Goldberg, Methods of Real Analysis, NY, John Wiley, New York 1976.
2. G.F.Simmons, Introduction to Topology and Modern Analysis, McGraw – Hill, New York, 1963.
3. G.Birkhoff and MacLane, A survey of Modern Algebra, 3rd Edition, Macmillan, NewYork, 1965.
4. J.N.Sharma and A.R.Vasistha, Real Analysis, Krishna Prakashan Media (P) Ltd, 1997.

Group A: Semester: V Core Paper –XIII

Subject title: Modern Algebra

Credit hours: 5

Subject description:

This course provides knowledge about sets, mappings, different types of groups and rings.

Goals:

To enable the students to understand the concepts of sets, groups and rings. Also the mappings on sets, groups and rings.

Objective:

On successful completion of course the students should have concrete knowledge about the abstract thinking like sets, groups and rings by proving theorems.

UNIT I

Sets – mappings – Relations and binary operations – Groups: Abelian group, Symmetric group Definitions and Examples – Basic properties.

UNIT II

Subgroups – Cyclic subgroup - Index of a group – Order of an element – Fermat theorem - A Counting Principle - Normal Subgroups and Quotient Groups.

UNIT III

Homomorphisms – Cauchy’s theorem for Abelian groups – Sylow’s theorem for Abelian groups Automorphisms – Inner automorphism - Cayley’s theorem, permutation groups.

UNIT IV

Rings: Definition and Examples –Some Special Classes of Rings – Commutative ring – Field – Integral domain - Homomorphisms of Rings.

UNIT V

Ideals and Quotient Rings – More Ideals and Quotient Rings – Maximal ideal - The field of Quotients of an Integral Domain

Treatment as in

I.N. Herstein, Topics in Algebra, John Wiley & Sons, New York, 2003.

Unit I	Chapter 1	Sections 1.1 to 1.3,
	Chapter 2	Sections 2.1 to 2.3
Unit II	Chapter 2	Sections 2.4 to 2.6
Unit III	Chapter 2	Sections 2.7 to 2.10
Unit IV	Chapter 3	Sections 3.1 to 3.3
Unit V	Chapter 3	Sections 3.4 to 3.6.

References

1. Surjeet Singh and Qazi Zameeruddin, Modern Algebra, Vikas Publishing house, 1992.
2. A.R.Vasishtha, Modern Algebra, Krishna Prakashan Mandir, Meerut, 1994 - 95.

Semester: V Core Paper –XIV

Subject Title: VISUAL BASIC

Credit hours: 5

UNIT I:

Introduction to VB – Event and Event Procedure – Object related concept- VB program development process- components- VB environment – saving and running –VB project- VB fundamentals- constants-variables- operators- library functions.

UNIT II:

Branching and looping- logical operators – If-then,If-then-Else,Select case- For Next, Do loop. While-Wend, Stop-VB control functions – Forms and controls.

UNIT III:

Menus and dialog boxes: Building Drop down menus, Accessing menu-sub menus- Popup menus- dialog boxes.
Executing and debugging a new project- Errors-Error handlers.

UNIT IV:

Procedures: Modulus and procedures- sub procedures-Event procedures-Function procedures.

Arrays : Characteristics-Declarations- Dynamic Arrays- Control arrays.

UNIT V:

Data Files: Characteristics-accessing and saving a file in VB –processing- Sequential Data file- Random access file-Binary files.

Treatment as in **Byron S Goutfield** ,”VB” ,scham’s outlines ,TMH Edition-2002

Reference : **Programming with VB 6.0** ,” **Mohammed Azam**”, Vikas Publications,2001

Semester: V Core Paper XV

Subject Title: DISCRETE MATHEMATICS

Credit Hours: 6

Subject Description: This course focuses on the mathematical logic, Relations & Functions, Formal languages and Automata, Lattices and Boolean Algebra and Graph Theories.

Goal: To enable the students to learn about the interesting branches of Mathematics.

Objectives: On successful completion of this course should gain knowledge about the Formal languages Automata Theory, Lattices & Boolean Algebra and Graph Theory.

UNIT-I:

Mathematical logic: Connections well formed formulas, Tautology, Equivalence of formulas, Tautological implications, Duality law, Normal forms, Predicates, Variables, Quantifiers, Free and bound Variables. Theory of inference for predicate calculus.(1-2, 1-2.7, 1-2.9, 1-2.10, 1-2.11, 1-3, 1-5.1, 1-5.2, 1-5.4, 1-6.4)

UNIT-II:

Relations and functions: Composition of relations, Composition of functions, Inverse functions, one-to-one, onto, one-to-one & onto, onto functions, Hashing functions, Permutation function, Growth of functions. Algebra structures: Semi groups, Free semi groups, Monoids, Groups, Cosets, Sets, Normal subgroups, Homomorphism. (2-3.5, 2-3.7, 2-4.2, 2-4.3, 2-4.6, 3-2, 3-5, 3-5.3, 3-5.4)

UNIT-III:

Formal languages and Automata: Regular expressions, Types of grammar, Regular grammar and finite state automata, Context free and sensitive grammars.(3-3.1, 3-3.2, 4-6.2)

UNIT-IV:

Lattices and Boolean algebra: Partial ordering, Poset, Lattices, Boolean algebra, Boolean functions, Theorems, Minimization of Boolean functions. (4-1.1, 4-2, 4-3, 4-4.2)

UNIT-V:

Graph Theories: Directed and undirected graphs, Paths, Reachability, Connectedness, Matrix representation, Euler paths, Hamiltonian paths, Trees, Binary trees simple theorems, and applications. (5-1.1, 5-1.2, 5-1.3, 5-1.4)

Text Books:

J.P Tremblay and R.P Manohar “Discrete Mathematical Structures with applications to computer science”, Mc.Graw Hill, 1975.

Reference Books:

1. Discrete maths by N. C.h S. Iyengar and others
2. Discrete maths by J.K. Sharma
3. Graph theory for computer science and Engineers by Narsingh

Deo

Diploma Course: Semester V

Subject title: 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 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 – Khandiswarup, 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 Core Paper –XVI

Subject Title: Complex Analysis

Credit Hours:5

Subject Description:

This course provides the knowledge about complex number system and complex functions.

Goal:

To enable the students to learn complex number system, complex function and complex integration.

Objectives:

On successful completion of this course the students should gained knowledge about the origin, properties and application of complex numbers and complex functions.

UNIT –I

Analytic function C-R equation – Sufficient condition – Harmonic functions.

UNIT-II

Bilinear transformation – Cross Ratio – Fixed Points – Transformation which map real axis to real axis – Unit circle to unit circle – real axis to unit circle.

UNIT –III

Complex integration- Cauchy's Integral Theorem – Cauchy's Integral formula – Derivatives of analytic function – Moreras Theorem – Cauchy's inequality – Liouville's Theorem – Fundamental Theorem of Algebra.

UNIT-IV

Taylor's Theorem – Taylor's Series – Laurent's Series – Singular points – Types of singularities – Properties of singular – Properties of singularities – Identification of singularities.

UNIT-V

Arguments Principle – Rouché's Theorem – Calculus of residue – Evaluation of definite integrals.

Prescribed Text Book

“Complex Analysis” by Durai Pandian & Laxmi Durai Pandian - Emerald Publications.

References

1. Complex Analysis – T.K.M.Pillai & S.Narayanan.
2. Complex Analysis – J.N.Sharma.

Semester: VI Core Paper –XVII

Subject title: INTERNET AND JAVA

Credit hours: 5

Subject description:

This paper presents the introduction to internet, ISP, mail, web, URLs, schemes, browser, HTML, Usenet, Gopher, veronica, Jug head, Anonymous ftp, archie, telnet, talk, IRC and muds, Java introduction, data types, operators, statements, class, packages, interfaces, exception handling, threads, applets and AWTs.

Goals:

To enable the students to study about internet,mail,web, HTML,Usenet, Gopher, veronica, Jug head, Archie and Java fundamentals, class, packages, exception handling,threads,applets and AWTs.

Objectives:

On successful completion of the course the students should have:
Learnt the basic concept of internet, mailing, HTML, Archie, telnet, ftp and IRC muds.
Learnt about Java fundamentals, operators and statements.
Learnt the concept of packages, interfaces and exception handling.
Learnt the concept of threads, applets and AWTs.

UNIT I:

Introduction to Internet- Resources of Internet -hardware and software requirements of internet- Internet service providers (ISP)-Internet addressing- Mail Using mail from a shell account - Introduction to web- using the web.

UNIT II:

URLs, schemes host names and port numbers- Using the browser Hypertext and HTML- Using the web from a shell account Introduction to Usenet - Reading and posting Usenet articles- Using Usenet from a shell account- Gopher ,Veronica and Jug head- Using gopher from a shell account.

UNIT III:

Anonymous ftp- Using ftp from a shell account-archie-file type uses on the internet downloading software - mailing lists- telnet- Using telnet from a shell account talk facilities- Using talks from a shell account – talk facilities – using talks from a shell account – IRC and muds .

UNIT IV:

Features of java - java environment - comparing java with C++ - introduction to java language -types - operators - flow control - classes - packages and interfaces.

UNIT V:

Java classes - string handling- exception handling - threads and synchronization -utilities - input / output - networking - applets - abstract windows toolkit (AWT)-imaging.

Text book:

1. Harley Hahn, The internet -Complete reference, second edition, Tata McGraw Hill, 1996.
2. Patric Naughton, Java Hand Book, Tata McGraw Hill, 1996

SEMESTER-VI: CORE PAPER XVIII - LAB

Internet Java Programming Practical List:

1. Create web pages using HTML to display ordered and unordered list of a departmental store.
2. Program to display image and text using HTML tag for a advertisement of a company product.
3. Create web pages for a business organization using HTML frames.
4. Create a web site of your department with minimum links using HTML .
5. Create a document using formatting and alignment tags in HTML.
6. Write a Java program to print the triangle of numbers.
7. Write a program which creates and displays a message on the windows.
8. Write a program to draw several shapes in the created window.
9. Write a Java program to accept values and find the given no. is even or odd. .
10. Write a Java program to calculate standard deviation.

VISUAL BASIC LIST OF PRACTICALS

1. In VB, create a project that displays the current data and time. Use VB variable Now and the Format Library function.

Write a program

2. To enter and display text. Use text box and command button.
3. To convert temperature from Fahrenheit to centigrade or vice-versa
4. To select any one from a list. Use combo box to display choices.
5. To calculate factorial of a given number.
6. To illustrate the usage of Timer control .
7. To illustrate the usage of scroll bars.
8. To illustrate the usage of Drop down menus.
9. To illustrate the usage of menu enhancement.
10. To illustrate the usage of Pop-up menu.
11. To illustrate the usage of input boxes.
12. To find smallest of n numbers.
13. To find the sine of angle.
14. To sort list of numbers.
15. To determine deviations about an average.

DIPLOMA COURSE - SEMESTER –VI 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

SUBJECT TITLE: ASTRONOMY – I

CREDIT HOURS: 6

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 anamolies.

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

ELECTIVE I - B

SUBJECT TITLE: Numerical Methods –I

CREDIT HOURS: 6

Subject Description: This course presents method to solve linear algebraic and transcendental equations and system of linear equations. Also Interpolation by using finite difference formulae.

Goal: It exposes the students to study numerical techniques as powerful tool in scientific computing.

Objective: On successful completion of this course the student gain the knowledge about solving the linear equations numerically and finding interpolation by using difference formulae.

Unit I: The solution of numerical algebraic and transcendental Equations:

Bisection method – Iteration Method – Convergence condition – Regula Falsi Method – Newton – Raphson method - Convergence Criteria – Order of Convergence.

Unit II: Solution of simultaneous linear algebraic equations:

Gauss elimination method – Gauss Jordan method – Method of Triangularization – Crouts method – Gauss Jacobi method – Gauss Seidel method

Unit III: Finite Differences:

Differences – operators – forward and backward difference tables – Differences of a polynomial – Factorial polynomial – Error propagation in difference table.

Unit IV: Interpolation (for equal intervals):

Newton’s forward and backward formulae – equidistant terms with one or more missing values – Central differences and central difference table – Gauss forward and backward formulae – Stirlings formula.

Unit V: Interpolation (for unequal intervals):

Divided differences – Properties – Relations between divided differences and forward differences – Newton’s divided differences formula – Lagrange’s formula and inverse interpolation.

Treatment as in

Kandasamy. P, Thilagavathi. K and Gunavathi. K “Numerical methods” – S. Chand and Company Ltd, New Delhi – Revised Edition 2007. (Chapters: 3,4,5,6,7 and 8).

References:

1. Venkataraman M. K.,”Numerical Methods in Science and Engineering” National Publishing company V Edition 1999.
2. Sankara Rao K., “Numerical Methods for Scientists and Engineers” 2nd Edition Prentice Hall India 2004.

ELECTIVE I - C

Subject Title: GRAPH THEORY

Credit Hours-6

Subject Description:

This course focuses on the Graphs, Sub Graphs, Trees, Planar graphs, Directed graphs. It also deals about matrix representation of Graphs.

Goal: To enable the students to understand the basic concepts of Graph Theory.

Objectives:

On successful completion of this course the students should gain knowledge about Graph Theory.

UNIT I:

Graphs –Sub graphs – Degree of a vertex walks, paths and cycles in a Graphs – connectedness cut vertex and cut edge.

UNIT II:

Entoriom and Hamiltonion Graphs – Algorithm for Entoriom circuits – Bipartite Graphs –Trees.

UNIT III:

Matrix representation of a graph – vector spaces, associated with a graph – cycle spaces and act set spaces.

UNIT IV:

Planar graphs – Enter’s theorem on planar graphs – characterization of planar graphs (no proofs) of the difficult part of the characterization.

UNIT V:

Directed graphs – Connectivity – Enteoriom Digraphs – Tournaments.
Treatment as in “A First Course in Graph Theory” by A.Chandran (Macmillan)
Chapters 1 to 7.

Books for References:

- 1.Narasingh Deo, “Graph Theory” (Prentice Hall of India).
2. Harary: “Graph Theory” (Narosa Publishing HQCK).

ELECTIVE II - A
Semester: VI

Subject Title: ASTRONOMY II

Credit Hours -6

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

SUBJECT TITLE: NUMERICAL METHODS- II

CREDIT HOURS: 6

Subject Description: This course presents Numerical differentiation, Numerical integration and method to solve the differential equations.

Goal: It exposes the students to study numerical techniques as powerful tool in scientific computing.

Objective: On successful completion of this course the student gain the knowledge about solving the linear equations numerically and finding interpolation by using difference formulae.

Unit I: Numerical differentiations:

Newton's forward and backward formulae to compute the derivatives –
Derivative using Stirlings formulae – to find maxima and minima of the function given the tabular values.

Unit II: Numerical Integration:

Newton – Cote's formula – Trapezoidal rule – Simpson's $1/3^{\text{rd}}$ and $3/8^{\text{th}}$ rules –
Gaussian quadrature
– two points and three points formulae

Unit III: Difference Equation:

Order and degree of a difference equation – solving homogeneous and non –
homogeneous
linear difference equations.

Unit IV:

Taylor series method – Euler's method – improved and modified Euler method –
Runge Kutta method (fourth order Runge Kutta method only)

Unit V: Numerical solution of O.D.E (for first order only):

Milne's predictor corrector formulae – Adam-Bashforth predictor corrector
formulae – solution of ordinary differential equations by finite difference method (for
second order O.D.E).

Treatment as in

Kandasamy. P, Thilagavathi. K and Gunavathi. K "Numerical methods" – S. Chand and
Company Ltd, New Delhi – Revised Edition 2007.

(Chapters: 9,10,11, Appendix and Appendix E).

References:

1. Venkataraman M. K., "Numerical Methods in Science and Engineering" National Publishing company V Edition 1999.
2. Sankara Rao K., "Numerical Methods for Scientists and Engineers" 2nd Edition Prentice Hall India 2004.

ELECTIVE II - C

SUBJECT TITLE: DIGITAL ELECTRONICS AND COMPUTER FUNDAMENTALS

UNIT-I

Representation of information Number System and Codes – Binary to Decimal Conversion - Decimal to Binary Conversion – Octal Numbers – Hexadecimal Numbers – ASCII Code – Excess-3 Code – Gray Code

UNIT-II

Logic circuits: Gates – AND, OR, NOT, NAND and NOR gates – Truth tables – Boolean Algebra – Karnaugh Maps – Product of sum and Sum of product methods – Don't care conditions – Multiplexers and Demultiplexers – Flip flops – RS, JK, D, T flip flops – Decoders.

UNIT-III

Shift Registers – Counters – Arithmetic circuits – Half adder – Full Adder – Half & full Subtractor – Binary adder & Subtractor – Serial & Parallel Binary Adders – BCD Adder.

UNIT-IV

I/O devices: Punched tape – Tape readers – Alphanumeric codes – Character recognition – CRT – Output Device : Magnetic tape Output offline Operation – Error detecting and correcting codes – Printers: Dot Matrix, Laser, CRT, Keyboards – Terminals.

UNIT-V

Semiconductor Memories: ROM – RAM – Static RAM, Dynamic RAM – Magnetic disc memories – Magnetic tape – Digital recording techniques

TEXT BOOK:

1. Digital Principles and Applications by Albert Malvino and Donald P Leach
2. Digital Computer fundamentals by T.C.Bartee.

REFERENCE:

Digital Circuits and Design by S. Salivaganan and S. Arivalagan.

ELECTIVE III - A
SUBJECT TITLE; AUTOMATA THEORY AND FORMAL LANGUAGES
CREDIT HOURS: 6

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- Addison Wesley.
2. R. Y. Kulin-Automata theory-Machines and Languages-McGraw Hill.

ELECTIVE III - 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 percetron – 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 – Synthethesis 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 , McGrow Hill , 1997.
2. Dr.Valluru.B.Rao, Hayagriva,V.Rao.C++ Neural Networks And Fuzzy Logic, BPB Publications , Second Edition, 1996

ELECTIVE III - C

INTERNET AND WEBDESIGN (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 and 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.