UNIVERSITY OF MADRAS
BACHELOR DEGREE COURSES
CHOICE BASED CREDIT SYSTEM.
(Effective from the academic year 2008 – 2009)

REGULATIONS

1. ELIGIBILITY FOR ADMISSION:

Candidates for admission to the first year of the Degree of Bachelor of Science courses shall be required to have passed the Higher Secondary Examinations (Academic or Vocational Stream) conducted by the Government of Tamil Nadu or an Examination accepted as equivalent thereof by the Syndicate of the University of Madras. Provided that candidates for admission into the specific main subject of study shall be Possess such other qualifying conditions as may be prescribed by the University as given in the **APPENDIX-A.**

2. ELIGIBILITY FOR THE AWARD OF DEGREE:

A candidate shall be eligible for the award of the Degree only if he /she has undergone the prescribed course of study in a College affiliated to the University for a period of not less than three academic years, passed the examinations all the Six-Semesters prescribed earning 140 Credits (in Parts-I, II, III, IV & V).

3. DURATION:

a)   Each academic year shall be divided into two semesters. The first academic year shall comprise the first and second semesters, the second academic year the third and fourth semesters and the third academic year the fifth and sixth semester respectively.

b)   The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year. There shall be not less than 90 working days for each semester.

4. COURSE OF STUDY:

The main Subject of Study for Bachelor Degree Courses shall consist of the following and shall be in accordance with **APPENDIX-B**

PART – I   TAMIL / OTHER LANGUAGES

PART – II   ENGLISH

PART – III   CORE SUBJECTS
              ALLIED SUBJECTS
              PROJECT/ELECTIVES WITH THREE COURSES

PART – IV

1.(a)   Those who have not studied Tamil up to XII Std. and taken a Non-Tamil
              Language under Part-I shall take Tamil comprising of two course (level will
              be at 6th Standard).

(b)   Those who have studies Tamil up to XII Std. and taken a Non-Tamil
              Language under Part-I shall take Advanced Tamil comprising of two
              courses.

(c)   Others who do not come under a + b can choose non-major elective
              comprising of two courses.

2.   SKILL BASED SUBJECTS (ELECTIVE) - (SOFT SKILLS)

3.   ENVIRONMENTAL STUDIES

4   VALUE EDUCATION

PART – V   EXTENSION ACTIVITIES

5. EXTENTION ACTIVITIES:

        A candidate shall be awarded a maximum of 1 Credits for Complusory Extension
Service.
        All the Students shall have to enrol for NSS /NCC/ NSO (Sports & Games) Rotract/
Youth Red cross or any other service organizations in the college and shall have to put in
Complusory minimum attendance of 40 hours which shall be duly certified by the Principal
of the college   before 31st March in a year.   If a student LACKS 40 HOURS

ATTENDANCE in the First year, he/she shall have to compensate the same during the subsequent years.

Students those who complete minimum attendance of 40 hours in One year will get HALF A CREDIT and those who complete the attendance of 80 or more hours in Two Years will ONE CREDIT.

Literacy and population Education Field Work shall be compulsory components in the above extension service activities.

6. SCHEME OF EXAMINATION:

Scheme of Examination shall be given in **APPENDIX - C**

Model Scheme

Course Component	. Ho	Cre dits	m	Ho	Max. Marks

Name of the course				Ext.mark	Int. mark	Total
PART-I **Language**				**75**	**25**	**100**
PART-II **English**				**75**	**25**	**100**
PART-III **Core subject :**				**75**	**25**	**100**
Core Subject				**75**	**25**	**100**
Allied Subject				**75**	**25**	**100**
PART – IV 1.(a) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two course (level will be at 6th Standard). (b) Those who have studies Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Advanced Tamil comprising of two courses. (c) Others who do not come under a + b can choose non-major elective comprising of two courses.						
2*Skill based subjects(Elective) – (Soft Skill)						

The following procedure be be followed for Internal Marks:
Theory Papers: Internal Marks   25
                        INTERNAL MARKS
         Tests (2 out of 3)   = 10
         Attendance   = 5
         Seminars   = 5
         Assignments   = 5
                                         -----
                          25 marks

                Break-up Details for Attendance
          Below 60%   - No marks
         60% to 75%   - 3 marks
         76% to   90 %   - 4 marks
         91% to 100%   - 5 marks

Practical: Internal Marks   40

            Attendance   5 marks

            Practical Test best 2 out of 3 30 marks

            Record   5 marks

Project:

Internal Marks   best 2 out of 3 presentations   20 marks

Viva   20 marks

Project Report   60 marks

7. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTER:

i. Candidates shall register their names for the First Semester Examination after the admission in UG Courses.

ii. Candidates shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination subject to the condition that the candidates should register for all the arrear subject of earlier semesters along the current (subsequent) Semester Subjects.

iii. Candidates shall be eligible to go to subsequent semester, only if they earn, sufficient attendance as prescribed therefor by the Syndicate from time to time.

Provided in case of a candidate earning less than 50% of attendance in any one of the Semesters due to any extraordinary circumstances such as medical grounds, such candidates who shall produce Medical Certificate issued by the Authorised Medical Attendant (AMA), duly certified by the Principal of the college, shall be permitted to proceed to the next semester and to complete the Course of study. Such Candidates shall have to repeat the missed Semester by rejoining after completion of Final Semester of the course, after paying the fee for the break of study as prescribed by the University from time to time.

8. PASSING MINIMUM:

A candidate shall be declared to have passed:

a)   There shall be no Passing Minimum for Internal.

b)   For External Examination, Passing Minimum shall be of 40%(Forty Percentage) of the maximum marks prescribed for the paper for each Paper/Practical/Project and Viva-voce.

c)   In the aggregate (External + Internal) the passing minimum shall be of 40% .

d)   He/She shall be declared to have passed the whole examination, if he/she passes in all the papers and practicals wherever prescribed / as per the scheme of examinations by earning 140 CREDITS in Parts-I, II, III, IV & V. He/she shall also fulfill the extension activities prescribed earning a minimum of 1 Credit to qualify for the Degree.

9. CLASSIFICATION OF SUCCESSFUL CANDIDATES:

PART- I TAMIL / OTHER LANGUAGES
TAMIL/OTHER LANGUAGES: Successful candidates passing the Examinations for the Language and securing the marks (1) 60 percent and above and (ii) 50 percent and above but below 60 percent in the aggregate shall be declared to have passed the examination in the FIRST and SECOND class, respectively. All other successful candidates shall be declared to have passed the examination in the THIRD Class.

PART – II ENGLISH
ENGLISH: Successful candidates passing the examinations for English and securing the marks (i) 60 percent and above and (ii) 50 percent and above but below 60 percent in the aggregate shall be declared to have passed the examination in the FIRST and SECOND Class, respectively. All other successful candidates shall be declared to have passed the examination in the THIRD class.

PART – III   consisting of CORE SUBJECTS,   ALLIED SUBJECTS, PROJECT / ELECTIVE with three courses:

Successful candidates passing the examinations for Core Courses together and securing the marks (i) 60 percent and above (ii) 50 percent and above but below 60 percent in the aggregate of the marks prescribed for the Core courses together shall be declared to have passed the examination in the FIRST and SECOND Class respectively. All other successful candidates shall be declared to have passed the examinations in the Third Class.

PART – IV (consisting of sub items 1 (a), (b) & (c), 2, 3 and 4) as furnished in the Regulations 4 Part-IV supra.

PART – V EXTENTION ACTIVITIES:

Successful Candidate earning of 1 credit SHALL NOT BE taken into consideration for Classification/Ranking/ Distinction.

10. RANKING:
Candidates who pass all the examinations prescribed for the course in the FIRST APPEARANCE ITSELF ALONE are eligible for Ranking/ Distinction.

Provided in the case of Candidates who pass all the examinations prescribed for the Course with a break in the First Appearance due to the reasons as furnished in the Regulations. 7 (iii) supra are only eligible for classification.

11. TRANSITORY PROVISION:

        Candidates who have undergone the course of study prior to the academic year 2008 – 2009 will be permitted to appear for the examinations under those Regulations for a period of TWO years i.e. up to and inclusive of April/May 2012 Examinations. Thereafter, they will permitted to appear for the examination only under the Regulations then in force.

Question Paper Pattern

SECTION – A (30 words)
10 OUT OF 12   -   10 X 2 marks   = 20 marks

SECTION – B (200 words)
5 out of 7   -   5 x 5   marks   = 25 marks

SECTION – C (500 words)
3 out of 5   -   3x 10 marks   =   30 marks

                        TOTAL   **=**   **75 marks**

QUESTION PAPER FOR PRACTICALS
        The external examiner will prepare a question paper on the spot with the help of the Question Bank supplied by the Controller's office.

BACHELOR OF COMPUTER APPLICATION
SYLLABUS

BACHELOR OF COMPUTER APPLICATION
SYLLABUS

Semester I -

Subject Code: **SAU1A**

Title of the Course/ Paper	Fundamentals Of Digital Computers		
Core	**I Year & First Semester**	Credit: 4	
Objective of the course	This course introduces the basic concepts of computers and fundamentals of Digital Principles		
Course outline	Unit 1: Fundamentals of computers – Characteristics of computers – Computer Language – Operating Systems – Generation of Computers.		
	Unit-2: Number systems - Conversion from one number system to another - compliments - Binary codes - Binary logic - Logic gates - Truth tables.		
	Unit 3: Boolean Algebra - Axioms - Truth table simplification of Boolean function - map method (upto 5 Variables) - Mc-Clausky tabulation method		
	Unit-4: Sequential logic – RS, JK, D and T Flip flops - Registers –Shift Registers - Counters – Ripple Counters – Synchronous Counter – Design of Counters		
	Unit-5 : Adders – Subtractors – Decoders – Encoders – Multiplexer - Demultiplexer – Design of Circuits using decoders/Multiplexers – ROM – PLA – Designing circuits using ROM/PLA		

1.Recommended Texts
    i.   M.M. Mano, Digital Logic and Computer Design, Pearson Education .
    ii.   V.Rajaraman,2002, Fundamentals of Computers, Third Edition,
        PHI, New Delhi.

2.Reference Books
   i .T.C.Bartee,1991,Computer Architecture and logical Design, McGraw Hill.

BCA
(Effective from the Academic Year 2015-16)
(For B. Sc Physics, Physics with Computer Application, Chemistry, Bio-Chemistry,
Electronic Science, Geophysics, Computer Science and Computer Application (BCA)
Major only)
Duration of Examination: 3 hrs
Maximum Marks: 100; Credits: 4

REVISED SYLLABUS

Semester I - Allied Paper I - Mathematics - I -SBAMM

UNIT – I   ALGEBRA AND NUMERICAL METHODS:

Algebra: Summation of series simple problems.
Numerical Methods: Operators E, Δ, ∇, difference tables, Newton-Raphson method Newton's forward and backward interpolation formulae for equal intervals, Lagrange's interpolation formula.

UNIT- II   MATRICES:

Symmetric, Skew-Symmetric, Orthogonal, Hermetian, Skew-Hermetian and Unitary matrices. Eigen values and Eigen-vectors, Cayley-Hamilton theorem (without proof) – verification-Computation of inverse matrix using Cayley - Hamilton theorem.

UNIT- III   THEORY OF EQUATIONS:

Polynomial equations with real coefficients, irrational roots, complex roots, symmetric functions of roots, transformation of equation by increasing or decreasing roots by a constant, reciprocal equation. Newton's method to find a root approximately - simple problems.

UNIT IV   TRIGONOMETRY:

Expansions of $\sin n\theta$ and $\cos n\theta$ in a series of powers of $\sin\theta$ and $\cos\theta$ - Expansions of $\sin^n\theta$, $\cos^n\theta$, $\tan^n\theta$ in a series of sines, cosines and tangents of multiples of "θ" - Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in a series of powers of "θ" – Hyperbolic and inverse hyperbolic functions - Logarithms of complex numbers.

UNIT V   DIFFERENTIAL CALCULUS:

Successive differentiation, n^{th} derivatives, Leibnitz theorem (without proof) and applications, Jacobians, Curvature and radius of curvature in Cartesian co-ordinates, maxima and minima of functions of two variables, Lagrange's multipliers - Simple problems

Book for Reference:

1. **S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.**
2. **P. Duraipandian and S.Udaya Baskaran, Allied Mathematics, Vol. I & II Muhil Publications Chennai**

Semester I - Practical I - PC-Software-SAZ11

MSWORD

1. Text Manipulations.
2. Usage of Numbering, Bullets, Footer and Headers.
3. Usage of Spell check, and Find & Replace.
4. Text Formatting.
5. Picture insertion and alignment.
6. Creation of documents, using templates.
7. Creation templates.
8. Mail Merge Concepts.
9. Copying Text & Pictures from Excel.

MS - EXCEL

10. Cell Editing.
11. Usage of Formulae and Bulit-in Functions.
12. File Manipulations.
13. Data Sorting (both number and alphabets).
14. Worksheet Preparation.
15. Drawing Graphs.
16. Usage of Auto Formatting.

POWER POINT

17. Inserting Clip arts and Pictures.
18. Frame movements of the above.
19. Insertion of new slides.
20. Preparation of Organisation Charts.

21. Presentation using Wizards.
22. Usage of design templates.

Semester II

Programming in C

SUBJECT CODE :SAE1A

Unit - I

C fundamentals Character set - Identifier and keywords - data types - constants - Variables - Declarations - Expressions - Statements - Arithmetic, Unary, Relational and logical , Assignment and Conditional Operators - Library functions.

Unit - II

Data input output functions - Simple C programs - Flow of control - if, if-else, while, do-while, for loop, Nested control structures - Switch, break and continue, go to statements - Comma operator.

Unit - III

Functions -Definition - proto-types - Passing arguments - Recursions. Storage Classes - AutOmatic, External, Static, Register Variables - Multi-file programs.

Unit - IV

Arrays - Defming and Processing - Passing arrays to functions - Multi-dimension arrays - Arrays and String. Structures - User defined data types - Passing structures to functions - Self-referential structures - Unions - Bit wise operations.

Unit - V

Pointers - Declarations - Passing pointers to Functions - Operation in Pointers - Pointer and Arrays - Arrays of Pointers - Structures and Pointers - Files: Creating, Processing ,Opening and Closing a data file.

REFERENCES:

1. B.W. Kernighan and D.M.Ritehie, The C Programming Language, 2nd Edition, PHI, 1988.
2. H. Schildt, C: The Complete Reference, 4th Edition, TMH Edition, 2000.
3. Gottfried,B.S, Programming with C, Second Edition, TMH Pub. Co. Ltd., New Delhi 1996.
4. Kanetkar Y., Let us C, BPB Pub., New Delhi, 1999

BCA
(Effective from the Academic Year 2015-16)
(For B. Sc Physics, Physics with Computer Application, Chemistry, Bio-Chemistry, Electronic Science, Geophysics, Computer Science and Computer Application (BCA) Major only)
Duration of Examination: 3 hrs
Maximum Marks: 100; Credits: 4

REVISED SYLLABUS

1.
Semester II - Allied Paper II - Mathematics - II -SBAMN

Unit-I   INTEGRAL CALCULUS:

Bernoulli's formula. Reduction formulae - $\int_o^{\frac{\pi}{2}} sin^n x dx$, $\int_o^{\frac{\pi}{2}} cos^n x dx$, $\int_o^{\frac{\pi}{2}} sin^m x cos^n x dx$ (m, n being positive integers), Fourier series for functions in (α, $\alpha+2\pi$), Half range sine and cosine series

Unit-II   DIFFERENTIAL EQUATIONS

Ordinary Differential Equations: second order non- homogeneous differential equations with constant coefficients of the form ay'' +by'+ cy = X where X is of the form $e^{\alpha x} cos\beta x$ and $e^{\alpha x} sin\beta x$

Partial Differential Equations: Formation, complete integrals and general integrals, four standard types and solving lagrange's linear equation P p +Q q= R

Unit-III   LAPLACE TRANSFORMS:

Laplace transformations of standard functions and simple properties, inverse Laplace transforms, Application to solution of linear differential equations up to 2nd order- simple problems.

Unit – IV   VECTOR DIFFERENTIATION

 Introduction, Scalar point functions, Vector point functions, Vector differential operator∇, Gradient, Divergence, Curl, Solenoidal, irrotational, identities.

Unit – V   VECTOR INTEGRATION

Line, surface and volume integrals, Gauss, Stoke's and Green's theorems (without proofs). Simple problems on these.

Book for Reference:

1. S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.
2. P. Duraipandian and S.Udaya Baskaran, Allied Mathematics, Vol. I & II Muhil Publications Chennai

Semester II - Practical II - Programming in C-SAE11

I. Summation of Series:

1. Sin(x)
2. Cos(x)
3. Exp(x) (Comparison with built in functions)

II String Manipulation:

1. Counting the no. of vowels, consonants, words, white spaces in a line of text and array of lines
2. Reverse a string & check for palindrome.
3. Substring detection, count and removal
4. Finding and replacing substrings

III Recursion:

1. nPr,nCr
2. GCD of two numbers
3. Fibonacci sequence
4. Maximum & Minimum
5. Towers of Hanoi.

IV Matrix Manipulation:
1. Addition & Subtraction
2. Multiplication
3. Transpose, and trace of a matrix
4. Determinant of a Matrix

V Sorting and Searching:
1. Insertion Sort
2. Bubble Sort
3. Linear Search

4. Binary Search

SEMESTER III

Title of the Course/	Paper –V **PROGRAMMING IN C++ AND DATA STRUCTURES**		
Core	**II Year & Third Semester**	Credit: 4	
Objective of the course	This course introduces the basic concepts of programming in C++ and Data Structures		
Course outline	Unit 1: Introduction to C++; Tokens, Keywords, Identifiers, Variables, Operators, Manipulators, Expressions and Control Structures in C++; Pointers - Functions in C++ - Main Function - Function Prototyping - Parameters Passing in Functions - Values Return by Functions - Inline Functions - Friend and Virtual Functions		
	Unit-2: Classes and Objects; Constructors and Destructors; and Operator Overloading and Type Conversions - Type of Constructors - Function overloading. Inheritance : Single Inheritance - Multilevel Inheritance - Multiple Inheritance - Hierarchical Inheritance - Hybrid Inheritance. Pointers, Virtual Functions and Polymorphism; Managing Console I/O operations.		
	Unit 3: Working with Files: Classes for File Stream Operations - Opening and Closing a File - End-of-File Deduction - File Pointers - Updating a File - Error Handling during File Operations - Command-line Arguments. Data Structures: Definition of a Data structure - primitive and composite Data Types, Asymptotic notations, Arrays, Operations on Arrays, Order lists.		
	Unit-4: Stacks - Applications of Stack - Infix to Postfix Conversion, Recursion, Maze Problems - Queues - Operations on Queues, Queue Applications, Circular Queue. Singly Linked List - Operations, Application - Representation of a Polynomial, Polynomial Addition; Doubly Linked List - Operations, Applications.		
	Unit-5 : Trees and Graphs: Binary Trees - Conversion of Forest to Binary Tree, Operations - Tree Traversals; Graph - Definition, Types of Graphs, Hashing Tables and Hashing Functions, Traversal - Shortest Path; Dijkstra's Algorithm.		

1. Recommended Texts

i. E. Balagurusamy,1995,Object Oriented Programming with C++, Tata McGraw-Hill
   Publishing Company Ltd.
ii..E.Horowitz and S.Shani,1999,Fundamentals of Data Structures in C++ , Galgotia Pub.

2.Reference Books
i. Robert Lafore, Object Oriented Programming in Microsoft C++, Galgotia publication.
ii.. H.Schildt, C++,1998,The Complete Reference-1998-TMH Edition, 1998
iii.R. Kruse C.L. Tondo and B. Leung ,1997, Data Structures and Program design in C,
   PHI.
iv.Cangsam,Auguenstein,Tenenbaum,Data Structures using C & C++,PHI
v. D.Samantha,2005, Classic Data Structures, PHI,New Delhi.

Title of the Course/	**Paper - VI -**	**MICROPROCESSORS AND ITS APPLICATIONS**	
Core	**II Year & Third Semester**	Credit: 4	
Objective of the course	This course introduces the fundamental concepts of Microprocessors.		
Course outline	Unit 1: Introduction to microcomputers-microprocessor and assembly languages-microprocessor architecture and its operations-8085 MPU-8085 instruction set and classifications		
	Unit 2: Writing assembly level programs-programming techniques such as looping-counting and indexing addressing modes-data transfer instructions-arithmetic and logic operations-dynamic debugging		
	Unit 3:Counters and time delays-hexadecimal counter modulo 10 counter-pulse timings for flashing lights-debugging counter and time delay program-stack-subroutine-conditional call and return instructions		
	Unit 4:BCD to binary and binary to BCD conversions-BCD to HEX and HEX to BCD conversions-ASCII to BCD to ASCII conversions-BCD to seven segment LED code conversions-binary to ASCII and ASCII to binary conversions-multi byte addition-multi byte subtraction-BCD addition-BCD subtraction-multiplication and division		
	Unit 5:Interrupt-implementing interrupts-multiple interrupt 8085-trap-problems on implementing 8085 interrupt-DMA memory interfaces-RAM & ROM –I/O interface-direct I/O memory mapped I/O.		

 Recommended Texts

 i. R.S.Ganokar-1990-Microprocessor architecture-Programming and Application with
8085/8080A-Wiley Eastern Limited.

 ii. A.Mathur-1993-Introduction to Microprocessor-3rd Edition-Tata McGraw Hill.

Title of the Course/	**Paper - VII** NUMERICAL AND STATISTICAL METHODS	
Core	**II Year & Third Semester**	Credit: 4
Objective of the course	This course introduces the concepts of Numerical Analysis and Statistical Methods	
Course outline	Unit-1: Introduction- Mathematical Preliminaries- Errors: Computations, Formula - Errors in a Series Approximation- Roots of Equations- Linear Equations: Bisection , False Position Methods- Newton-Raphson Method- Secant Method- Muller's Method- Lin-Bairstow's Method- Simultaneous Linear Equations: Matrix Inversion Method- Gauss Elimination, Gauss-Jordan, LU Decomposition Methods- Gauss-Seidel Method.	
	Unit-2: Numerical Differentiation- Errors in Numerical Differentiation- Cubic Spline Method- Numerical Integration- Trapezoidal Rule- Simpson's 1/3 and 3/8 Rules- Romberg Integration- Ordinary Differential Equations- Taylor's Series Method- Euler's Method- Runge-Kutta 2nd and 4th Order Methods-Predictor-Corrector Methods.	
	Unit-3: Sampling- Frequency Distribution- Cumulative Frequency Function- Grouped Sample- Measures of Central Tendency: Mean, Median and Mode- Geometric Mean- Harmonic Mean – Dispersion: Range, Mean Deviation, Variance and Standard Deviation- Moments- Computation of Moments	
	Unit-4: Probability- Characteristics: Addition, Multiplication and Conditional Probability Laws- Discrete Distributions: Random Variable- Density and Distribution Functions.- Binomial Distribution- Poisson Distribution- Hypergeometric Distribution- Mathematical Expectation.	

	Unit-5 : Correlation and Regression Analysis: Linear Least Squares Fit- Nonlinear Fit- Fitting a Polynomial Function- Coefficient of Correlation- Properties- Multiple Correlation – Partial Correlation- Rank Correlation- Tests of Significance- Chi square Test- Goodness of Fit, Algorithm and Analysis of Contingency Tables- t-Test and F-Test.

1.Recommended Texts

i. S.S.Sastry, 2005,Introductory Methods of Numerical Analysis, 4th Edition,
   Prentice- Hall of India Pvt. Ltd..

ii.E.Balagurusamy , 2000, Computer Oriented Statistical and Numerical Methods-
   Macmillan India Ltd.

2. Reference Books

i. V. Rajaraman,2005, Computer Oriented Numerical Methods, 3rd Edition,
    Prentice- Hall of India Pvt. Ltd..

ii. K. S. Trivedi,2005,Probability and Statistics with Reliability, Queuing and Computer
    Science Applications, Prentice-Hall of India Pvt. Ltd.

iii.E. Balagurusamy,1999, Numerical Methods, Tata McGraw-Hill Publishing Co. Ltd..

iv. P. Niyogi,2003,Numerical Analysis and Algorithms, Tata McGraw-Hill Publishing
    Co. Ltd..

Title of the Course/	**Paper - VIII Practical – III** **PROGRAMMING IN C++ USING DATA STRUCTURES**		
Core	**II Year & Third Semester**	Credit: 3	
Objective of the course	This course deals with practical implementation of Data Structure using C++.		
Course outline	1. Implement PUSH, POP operations of stack using Arrays. 2. Implement PUSH, POP operations of stack using Pointers. 3. Implement add, delete operations of a queue using Arrays. 4. Implement add, delete operations of a queue using Pointers. 5. Conversion of infix to postfix using stack operations 6. Postfix Expression Evaluation. 7. Addition of two polynomials using Arrays and Pointers. 8. Creation, insertion, and deletion in doubly linked list. 9. Binary tree traversals (in-order, pre-order, and post-order) using linked list. 10.Depth First Search and Breadth first Search for Graphs using Recursion.		

The following are the revised Syllabus relating to Allied Paper III Financial Accounting in III Semester of BACHELOR OF COMPUTER APPLICATION offered under CBCS pattern by the affiliated Arts & Science Colleges w.r.f 2011 – 12 (i.e. for the batch of students admitted from the academic year 2010 – 2011 and thereafter).

Title of the Course/ Paper III	**ALLIED PAPER III FINANCIAL ACCOUNTING**		
	II Year & Third Semester	Credit:4	
Objective of the Course	This course introduces the concepts of Financial Accounting.		
Course Outline	Unit-1: Meaning and scope of Accounting - Basic Accounting concepts and conversions - Objectives of Accounting - Accounting transactions - Double entry book keeping - Journal, Ledger, preparation of Trial Balance - Preparation of Cash Book		
	Unit-2: Preparation of Final accounts of sole trading Concerns - Adjustments to final accounts.		
	Unit-3: Classification and rectification of errors – preparation of suspense Account -Bank Reconciliation Statement		
	Unit-4: Depreciation - Meaning, causes, types - problems based on straight line and diminishing Balance methods.		
	Unit-5: Meaning, features, defects, Statement of Affairs method and conversion method. (Problems on Statement of Affairs method only). .		

1.**Recommended Texts & Reference**
1. Gupta R.L, Advanced Accountancy, S.Chand, Delhi.
2. Agarwala A.N, Higher Science of Accountancy, Kitab Mahal,Allahabad.
3. S.P. Jain and K.L. Narang, Financial Accounting
4. M.C.Shukla and T.S.Grawel, Adavnced Accounts(Vol. I)
5.Gillespie Accounting system, Procedure & methods, Prentice Hall India Ltd, New Delhi.

SEMESTER IV

Title of the Course/	**Paper-IX**	**PROGRAMMING IN JAVA**	
Core	**II Year & Fourth Semester**	Credit: 4	
Objective of the course	This course introduces the basic concepts of programming in JAVA		
Course outline	**Unit-1**: Introduction to Java-Features of Java-Basic Concepts of Object Oriented Programming-Java Tokens-Java Statements-Constants-Variables-Data Types- Type Casting-Operators-Expressions-Control Statements: Branching and Looping Statements.		
	Unit-2:Classes, Objects and Methods - Constructors - Methods Overloading-Inheritance-Overriding Methods-Finalizer and Abstract Methods-Visibility Control –Arrays, Strings and Vectors-StringBuffer Class-Wrapper Classes		
	Unit-3: Interfaces-Packages-Creating Packages-Accessing a Package-Multithreaded Programming-Creating Threads-Stopping and Blocking a Thread-Life Cycle of a Thread-Using Thread Methods-Thread Priority-Synchronization-Implementing the Runnable Interface		
	Unit-4: Managing Errors and Exceptions-Syntax of Exception Handling Code-Using Finally Statement-Throwing Our Own Exceptions-Applet Programming-Applet Life Cycle-Graphics Programming-Managing Input/Output Files: Concept of Streams-Stream Classes-Byte Stream Classes-Character Stream Classes – Using Streams-Using the File Class-Creation of Files-Random Access Files-Other Stream Classes.		
	Unit-5 : Network basics –socket programming – proxy servers – TCP/IP – Net Address – URL – Datagrams -Java Utility Classes-Introducing the AWT: Working with Windows, Graphics and Text- AWT Classes-Working with Frames-Working with Graphics-Working with Color-Working with Fonts-Using AWT Controls, Layout Managers and Menus.		

1. Recommended Texts
  i. E. Balagurusamy ,2004,Programming with JAVA-2nd Edition, Tata McGraw-Hill Publishing Co.Ltd, New Delhi.

  ii. Herbert Schildt,The Complete Reference Java^{TM} ' 2- 5th Edition,Tata McGraw-Hill Publishing Co. Ltd,New Delhi.

2. Reference Books
  i. Y. Daniel Liang ,2003, An Introduction to JAVA Programming ,Prentice-Hall of India Pvt. Ltd.
  ii. Cay S. Horstmann and Gary Cornell,2005,Core Java^{TM}2 Volume I,Fundamental 7th Edition,Pearson Education.

Title of the Course/	**Paper-X**	OPERATING SYSTEMS	
Core	**II Year & Fourth Semester**	Credit: 4	
Objective of the course	This course introduces the functions of operating systems.		
Course outline	**Unit 1:** Introduction: Views –Goals –Types of system – OS Structure – Components – Services - System Structures – Layered Approach -Virtual Machines - System Design and Implementation. Process Management: Process - Process Scheduling – Cooperating Process –Threads - Interprocess Communication. CPU Scheduling : CPU Schedulers – Scheduling criteria – Scheduling Algorithms		
	Unit-2:– Process Synchronization: Critical-Section problem - Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Critical Region – Monitors. Deadlock : Characterization – Methods for handling Deadlocks – Prevention, Avoidance, and Detection of Deadlock - Recovery from deadlock.		
	Unit 3: Memory Management : Address Binding – Dynamic Loading and Linking – Overlays – Logical and Physical Address Space - Contiguous Allocation – Internal & External Fragmentation . Non Contiguous Allocation: Paging and Segmentation schemes – Implementation – Hardware Protection – Sharing - Fragmentation.		
	Unit-4: Virtual Memory **:**: Demand Paging – Page Replacement - Page Replacement Algorithms – Thrashing. – File System: Concepts – Access methods – Directory Structure –Protection Consistency Semantics – File System Structures – Allocation methods – Free Space Management.		
	Unit-5 : I/O Systems: Overview - I/O Hardware – Application I/O Interface – Kernel I/O subsystem – Transforming I/O Requests to Hardware Operations – Performance. Secondary Storage Structures : Protection – Goals- Domain Access matrix – The security problem – Authentication – Threats – Threat Monitoring – Encryption..		

1. Recommended Texts
i. Silberschatz A., Galvin P.B., Gange,. 2002 , Operating System Principles ,Sixth Edition, John Wiley & Sons.
2.Reference Books
i. H.M. Deitel ,1990, An Introduction to Operating System,- Second Edition, Addison Wesley.

Title of the Course/	**Paper-XI**	**COMPUTER GRAPHICS**	
Core	**II Year & Fourth Semester**	Credit: 4	
Objective of the course	This course introduces the concepts of Computer Graphics.		
Course outline	**Unit-1:** Brief Survey of Computer Graphics – Graphics Systems: Video Display Devices – Types – Raster-Scan Systems and Random-Scan Systems – Input Devices – Hard-Copy Devices – Graphics Software.		
	Unit-2: Line-Drawing (DDA and Bresenham's) Algorithms – Circle-Generating (Midpoint) Algorithm – Ellipse-Generating (Midpoint) Algorithms – Area-Filling (Boundary-Fill and Flood-Fill) Algorithms - Line Attributes - Color and Grayscale Levels – Character Attributes – Inquiry Functions .		
	Unit-3: Two-Dimensional Transformations and Viewing: Basic Transformations – Matrix Representations and Homogeneous Coordinates – Composite Transformations–Other Transformations Window-to- Viewport Coordinate Transformation – Clipping Algorithms: Cohen-Sutherland Line Clipping and Sutherland – Hodgeman Polygon Clipping – Basic Modeling Concepts – Interactive Input Methods: Logical Classification of input Devices – Interactive Picture-Construction Techniques.		
	Unit-4: Three-Dimensional Display Methods: Parallel and Perspective Projections – Depth Cueing - Visible Line and Surface Identification – Polygon Surfaces: Polygon Tables, Plane Equations and Polygon Meshes - Three-Dimensional Transformations: Basic, Other and Composite Transformations.		
	Unit-5 : Viewing Pipeline and Coordinates – Transformation from World to Viewing Coordinates – Projection Transformations - Matrices - View Volumes - Hidden Surface and Hidden Line Elimination Methods: Back-Face Detection , Depth-Buffer and A-Buffer Methods – -Wireframe Methods.		

1.Recommended Texts
i. D.Hearn and M.P. Baker, 2005, Computer Graphics , C Version,2nd Edition ,
Pearson Education , New Delhi.
 2. Reference Books
i. W.M.Newman and R.F.Sproull,1997,2nd Edition ,Principles of Interactive
   Computer Graphics, Tata McGraw-Hill Publishing Co. Ltd.
Ii .D.P.Mukherjee,1999,Fundamentals of Computer Graphics and Multimedia,
   1st Edition, Prentice-Hall of India Pvt. Ltd. – 1999.
iii .N. Krishnamurthy ,2002,Introduction to Computer Graphics, 1st Edition,
   Tata McGraw-Hill Publishing Co. Ltd..
iv. D.F.Rogers , 2001, Procedural Elements for Computer Graphics , 2nd Edition ,
   Tata McGraw-Hill Publishing Co. Ltd..
v.. Xiang and R.A. Plastock ,2002 ,Computer Graphics , Schaum's Outline
   Series, Tata McGraw-Hill Publishing Co.

Title of the Course/	**Paper- XII**		**JAVA PROGRAMMING LAB**
Core	**II Year & Fourth Semester**	Credit: 4	
Objective of the course	This course introduces the concepts of Java Programming		
Course outline	**APPLICATIONS:** 1. Substring Removal from a String. Use String Buffer Class. 2. Determining the Perimeter and Area of a Triangle. Use Stream Class. 3. Determining the Order of Numbers Generated randomly using Random Class. 4. Usage of Calendar Class and Manipulation. 5. Implementation of Point Class for Image Manipulation. 6. String Manipulation Using Char Array. 7. Database Creation for Storing E-mail Addresses and Manipulation. 8. Usage of Vector Classes. 9. Interfaces and Packages 10. Implementing Thread based Applications and Exception Handling. 11. Application using Synchronization such as Thread based, Class based and Synchronized Statements. 12. Textfiles (copy, display, counting characters, words and lines) 13. Data file creating and processing for electricity billing. 14. Data file creating and processing for telephone billing **APPLETS:** 15. Working with Frames and Various Controls. 16. Working with Dialog Box and Menus. 17. Working with Colors and Fonts. 18. Drawing various shapes using Graphical statements. 19. Working with panel and all types of Layout. 20. Design a simple calculator with minimal of 10 operations 21. Usage of buttons, labels, text components in suitable application 22. Usage of Radio buttons, check box ,choice list in suitable application		

Title of the Course/	ALLIED PAPER IV COST AND MANAGEMENT ACCOUNTING		
Allied	**II Year & Fourth Semester**	Credit: 4	
Objective of the course	This course introduces the concepts of Cost and Management Accounting		
Course outline	**Unit-1:** Cost Accounting: Definition, Meaning and objectives - Distinction between Cost and Financial Accounting. Elements of cost and preparation of cost sheets and tender. Management Accounting – Definition and objectives – Distinction between management and financial accounting.		
	Unit-2: Stores Records - Purchase Order - Goods Received. Note - Bin Card - Stores Ledger - Purchase, Receipt and Inspection - Inventory Control - ABC Analysis - Economic Ordering Quantity - Maximum, Minimum and Reordering levels - Methods of Pricing Issued. Labour: Importance of Labour Cost Control - Various Methods of Wage Payment - Calculation of wages - Methods of Incentive for Schemes		
	Unit-3: Overheads: Factory, Administration, Selling and Distribution of overheads - Classification - Allocation and Apportionment-Redistribution (Secondary Distribution) - Absorption of Over heads including 'Machine Hour Rate		
	Unit-4: Funds Flow and Cash Flow Analysis**:** Schedule of changes in working capital - Preparation of 'funds flow statement'-Preparation of 'Cash Flow Statement' - Importance of funds flow and cash flow Analysis - Difference between funds flow and cash flow. Ratio Analysis : Utility and limitations of Accounting Ratios - calculation of Accounting Ratios - Ratio Analysis for Liquidity, Solvency, Profitability and Leverage.		
	Unit-5 : Marginal Costing: The Concept - Break Even Analysis - Break - Even Chart - Importance and assumptions - Application of Profit Volumes Ratio - Different types of problems (with special emphasis on decision making problems). Budget and Budgetary Control : Procedure and Utility - Preparation of different types of Budget including Flexible Budget		

1.Recommended Texts & Reference
1.   Wheldon A.J., Cost Accounting and Costing Methods.
2. Iyengar S.P., Cost Accounting : Principles and Practice.
3. Bhar B.K., Cost Accounting : Methods and problems.
4. Bigg W.W., Cost Accounts.
5. Prasad N.K, Cost Accounting : Principles and Problems.
6. Jain S.P. and Narang K.L., Advanced Cost Accounting.

7. Agarwal M., Theory and Practices of Cost Accounting
8. Robert Anthony : Management Accounting : Text and cases.
9. Maheswari S.N., Principles of Management Accounting.

SEMESTER V

Title of the Course/	**Paper-XIII DATABASE MANAGEMENT SYSTEMS**		
Core	**III Year & Fifth Semester**	Credit: 4	
Objective of the course	This course introduces the basic concepts of database management systems		
Course outline	Unit-1: Advantages and Components of a Database Management Systems – Feasibility Study – Class Diagrams – Data Types – Events – Normal Forms – Integrity – Converting Class Diagrams to Normalized Tables – Data Dictionary.		
	Unit-2: Query Basics – Computation Using Queries – Subtotals and GROUP BY Command – Queries with Multiple Tables – Subqueries – Joins – DDL & DML – Testing Queries		
	Unit-3: Effective Design of Forms and Reports – Form Layout – Creating Forms – Graphical Objects – Reports – Procedural Languages – Data on Forms – Programs to Retrieve and Save Data – Error Handling.		
	Unit-4: Power of Application Structure – User Interface Features – Transaction – Forms Events – Custom Reports – Distributing Application – Table Operations – Data Storage Methods – Storing Data Columns – Data Clustering and Partitioning.		
	Unit-5 : Database Administration – Development Stages – Application Types – Backup and Recovery – Security and Privacy – Distributed Databases – Client/Server Databases – Web as a Client/Server System – Objects – Object Oriented Databases – Integrated Applications.		

Recommended Texts
1.G. V. Post – Database Management Systems Designing and Building Business
   Application – McGraw Hill International edition – 1999.

Reference Books
1.Raghu Ramakrishnan – Database Management Systems – WCB/McGraw Hill – 1998.
2.C.J. Date – An Introduction to Database Systems – 7th Edition – Addison Wesley   -
   2000.

Title of the Course/	Paper -XIV	SOFTWARE ENGINEERING	
Core	**III Year & Fifth Semester**	Credit: 4	
Objective of the course	This course introduces the concepts of Life Cycle of Software		
Course outline	Unit-1: Introduction to Software Engineering Some definition – Some size factors – Quality and productivity factors – Managerial issue. Planning a Software Project: Defining the problem – Developing a solution strategy – planning the development process – planning an organization structure – other planning activities		
	Unit-2: Software Cost Estimation: Software – Cost factors – Software cost estimation techniques – specification techniques – level estimation – estimating software maintenance costs.		
	Unit-3: Software requirements definition: The software requirements specification – formal languages and processors for requirements specification.		
	Unit-4: Software Design: Fundamental Design concepts – Modules and modularizing Criteria – Design Notations – Design Techniques – Detailed Design Consideration – Real time and distributed system design – Test plan – Mile stones walk through and inspection – Design guide lines		
	Unit-5 : Verification and validation techniques: Quality assurance – Static analysis – symbolic exception – Unit testing and Debugging – System testing – Formal verification. Software maintenance: Enhancing maintainability during development – Managua aspects of software maintenance – Configuration management – source code metrics – other maintenance tools and techniques.		

1. Recommended Texts
   i. Richard E.Fairly - Software Engineering Concepts - Tata McGraw-Hill book
      Company.
2. Reference Books
   i. R.S.Pressman, 1997, Software Engineering – 1997 - Fourth Ed., McGraw Hill.
   ii. Rajib Mall ,2004,Fundamentals of Software Engineering,2nd Edition, PHI.

Title of the Course/	**Paper -XV** **RESOURCE MANAGEMENT TECHNIQUES**		
Core	**III Year & Fifth Semester**	Credit: 4	
Objective of the course	This course introduces the concepts of Resource Management Technique		
Course outline	Unit-1: Basics of Operations Research (OR): Characteristics of O.R - Necessity of O.R in Industry -OR and Decision making - Role of computers in O.R. Linear programming: Formulations and Graphical solution (of 2 variables) canonical & standard terms of Linear programming problem. Algebraic solution: Simplex method.		
	Unit-2: Algebraic solution: Charnes method of penalties - two phase simplex method - concept of Duality - properties of duality - Dual simplex method.		
	Unit-3: Transportation model: Definition - formulation and solution of transportation models - the row - minima, column - minima, matrix minima and vogel's approximation methods. Assignment model: Definition of Assignment model - comparison with transportation model - formulation and solution of Assignment model - variations of Assignment problem.		
	Unit-4: Sequencing problem: Processing each of n jobs through m machines - processing n jobs through 2 machines - processing n jobs through 3 machines - processing 2 jobs through m machines - processing n jobs through m machines - travelling salesman problem. Game Theory: Characteristics of games - Maximin, Minimax criteria of optimality - Dominance property - algebraic and graphical method of solution of solving 2 x 2 games.		
	Unit-5 : Pert - CPM: Networks - Fulkerson's Rule - measure of activity - PERT computation - CPM computation - resource scheduling. Simulation: Various methods of obtaining random numbers for use in computer simulation - Additive, multiplicative and mixed types of congruence random number generators - Monte Carlo method of simulation - its advantages and disadvantages.		

1.Recommended Texts

i. Hamdy A. Taha: ,1996,Operation Research - An Introduction, 5th edition, Prentice Hall of India, Pvt. Ltd., New Delhi .

ii.. Ackoff R.L. and Sasieni M. W,1968, Fundamentals of Operations Research, John Wiley and sons, New York.

iii. Charnes A. Cooper W. and Hendersen A.,1953, Introduction to Linear Programming, Wiley and Sons, New York.

iv. Srinath L.S,1973, PERT and CPM principles and applications, Affiliated East West Press
   Pvt. Ltd., New York .

Title of the Course/	**Paper _XVI**	**RDBMS LAB**	
Core	**III Year & Fifth Semester**	Credit: 4	
Objective of the course	This course gives an exposure to visual programming using Visual Basic software.		
Course outline	Creation of a Database and performing the operations given below using a Menu Driven Program. a) Insertion b)Deletion c) Modification d) Generating a Simple report for the following: 1. Payroll 2. Mark sheet Processing 3. Saving Bank account for banking 4. Inventory System 5. Invoice system 6. Library information system 7. Student information system 8. Income tax processing system 9. Electricity bill preparation system **10.** 10.Telephone directory maintenance		

ELECTIVE – I

Title of the Course/ Paper	**VISUAL PROGRAMMING**		
Elective	**III Year & Fifth Semester**	Credit: 4	
Objective of the course	To inculcate knowledge on Visual Basic concepts and Programming.		
Course outline	Unit 1: Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String - Numbers.		
	Unit-2: Displaying Information - Determinate Loops - Indeterminate Loops - Conditionals - Built-in Functions - Functions and Procedures.		
	Unit 3: Lists - Arrays - Sorting and Searching - Records - Control Arrays - Combo Boxes - Grid Control - Projects with Multiple forms - DoEvents and Sub Main - Error Trapping.		
	Unit-4: VB Objects - Dialog Boxes - Common Controls - Menus - MDI Forms - Testing, Debugging and Optimization - Working with Graphics.		
	Unit-5 : Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop.		

1. Recommended Texts
  1. Gary Cornell - Visual Basic 6 from the Ground up - Tata McGraw Hill - 1999.
  2. Noel Jerke - Visual Basic 6 (The Complete Reference) - Tata McGraw Hill – 1999

Title of the Course/ Paper	**RDBMS AND ORACLE**	
Elective	**III Year & Fifth Semester**	Credit: 4
Objective of the course	To inculcate knowledge on RDBMS concepts and Programming with Oracle.	
Course outline	Unit 1: Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. Database Design: Data Modeling and Normalization: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams - Denormalization – Another Example of Normalization.	
	Unit-2: Oracle9*i*: Overview: Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL *Plus Environment – SQL – Logging into SQL *Plus - SQL *Plus Commands – Errors & Help – Alternate Text Editors - SQL *Plus Worksheet - *i*SQL *Plus. Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.	
	Unit 3: Working with Table: Data Management and Retrieval: DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. Functions and Grouping: Built-in functions –Grouping Data. Multiple Tables: Joins and Set operations: Join – Set operations.	
	Unit-4: PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQ L in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.	
	Unit-5 : PL/SQL Composite Data Types: Records – Tables – Varrays. Named Blocks: Procedures – Functions – Packages –Triggers –Data Dictionary Views.	

1. Recommended Texts

1. DATABASE SYSTEMS USING ORACLE – Nilesh Shah, 2nd edition, PHI.
2. Reference Books
1. DATABASE MANAGEMNET SYSTEMS – Arun Majumdar & Pritimoy
   Bhattacharya, 2007, TMH.
2. DATABASE MANAGEMENT SYSTEMS – Gerald V. Post, 3rd edition, TMH.

Title of the Course/ Paper	**UNIX PROGRAMMING**	
Elective	**III Year & Fifth Semester**	Credit: 4
Objective of the course	This course introduces fundamentals & programming of Unix basic concepts	
Course outline	Unit 1: INTRODUCTION: File and common commands - Shell - More about files - Directories- Unix system - Basics of file Directories and filenames - Permissions - modes - Directory hierarchy - Devices - the grep family - Other filters - the stream editor sed - the awk pattern scanning and processing language - files and good filters.	
	Unit-2: CONCEPTS OF SHELL: Command line structure - Metacharacters - Creating new commands - Command arguments and parameters - program output as arguments - Shell variables - More on I/O redirection - loop in shell programs - Bundle - Setting shell attributes, Shift command line parameters - Exiting a command or the shell, evaluating arguments - Executing command without invoking a new process - Trapping exit codes -- Conditional expressions.	
	Unit 3: SHELL PROGRAMMING: Customizing the cal command, Functions of command, While and Until loops - Traps - Catching interrupts - Replacing a file - Overwrite - Zap - Pick command - News command - Get and Put tracking file changes.	
	Unit-4: FEATURES IN UNIX: Standard input and output - Program arguments - file access - A screen at a time printer - On bugs and debugging - Examples - Zap - pick - Interactive file comparison program - Accessing the environment - Unix system calls - Low level I/O, File system Directories and modes, Processors, Signal and Interrupts	
	Unit-5 : PROGRAM DEVELOPMENT AND DOCUMENT PREPARATION:Program development - Four function calculator - Variables and error recovery - Arbitrary variable names, Built in functions, Compilation into a machine, Control flow and relational operators, Functions and procedures - Performance evaluation - Ms macro package - Troff level - Tbl and eqn preprocessors - Manual page - Other document preparation.	

1. Recommended Texts

1. Brian W. Kernighan, Rob Pike - The UNIX Programming Environment - Prentice Hall of India(1984).

2. Reference Books

1. Steven Earhart - The UNIX System for MSDOS Users - Galgotia book source P. Ltd. (1990).
2. Stefen Prata - Advanced UNIX - A Programmer Guide.

SEMESTER – VI

Title of the Course/	**Paper-XVII**	**WEB TECHNOLOGY**	
Core	**III Year & Sixth Semester**		Credit: 4
Objective of the course	This course introduces the concepts of ASP, VB Script, Java Script.		
Course outline	Unit 1: Introduction to VBScript - Adding VBScript Code to an HTML Page - VB Script Basics - VBScript Data Types - VBScript Variables - VBScript Constants - VBScript Operators – mathematical- comparison-logical - Using Conditional Statements - Looping Through Code - VBScript Procedures – type casting variables - math functions –date functions – string functions –other functions - VBScript Coding Conventions - Dictionary Object in VBScript - Err Object		
	Unit-2: Introduction to Javascript – Advantages of Javascript – Javascript syntax - Data type –Variable - Array – Operator & Expression – Looping – control structures - Constructor Function – user defined function Dialog Box .		
	Unit 3: Javascript document object model – Introduction – Object in HTML – Event Handling – Window object – Document object – Browser object – Form object – Navigator object – Screen object – Build in object – User defined object – Cookies.		
	Unit-4: ASP.NET Language Structure – Page Structure – Page event , Properties & Compiler Directives . HTML server controls – Anchor, Tables, Forms, Files . Basic Web server Controls – Label, Text box, Button, Image Links, Check & radio Button, Hyperlink, Data List Web Server Controls – Check box list. Radio button list, Drop down list, List box, Data grid, Repeater.		
	Unit-5: Request and Response Objects, Cookies, Working with Data – OLEDB connection class, command class, transaction class, data adaptor class, data set class. Advanced issues – email, Application issues, working with IIS and page Directives , error handling. Security – Authentication, IP Address, Secure by SSL & Client Certificates		

1.Recommended Texts

i.I.Bayross, 2000, Web Enable Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI, BPB Publications.

ii. A.Russell Jones, Mastering Active Server Pages 3, BPB Publications.

2. Reference Books

i. Hathleen Kalata, Internet Programming with VBScript and JavaScript, Thomson Learning

ii. Mike McGrath, XML Harness the Power of XML in easy steps, Dreamtech Publications

iii. T.A. Powell, 2002,Complete Reference HTML , TMH.

iv. J.Jaworski, 1999, Mastering Javascript, BPB Publications.

v. Powell, Thomas; Schneider, Fritz, JavaScript: The Complete Reference, 2nd edition 2004, TMH

Title of the Course/	**Paper-XVIII**	**DATA COMMUNICATION AND NETWORKING**	
Core	**III Year & Sixth Semester**	Credit: 4	
Objective of the course	This course introduces the concepts of Networking		
Course outline	Unit-1: Introduction to Data Communication, Network, Protocols & standards and standards organizations - Line Configuration - Topology - Transmission mode - Classification of Network - OSI Model - Layers of OSI Model.		
	Unit-2: Parallel and Serial Transmission - DTE/DCE/such as EIA-449, EIA-530, EIA-202 and x.21 interface - Interface standards - Modems - Guided Media - Unguided Media - Performance - Types of Error - Error Detection - Error Corrections.		
	Unit-3: Multiplexing - Types of Multiplexing - Multiplexing Application - Telephone system - Project 802 - Ethernet - Token Bus - Token Ring - FDDI - IEEE 802.6 - SMDS - Circuit Switching - Packet Switching - Message switching - Connection Oriented and Connectionless services.		
	Unit-4: History of Analog and Digital Network - Access to ISDN - ISDN Layers - Broadband ISDN - X.25 Layers - Packet Layer Protocol - ATM - ATM Topology - ATM Protocol.		
	Unit-5 : Repeaters - Bridges - Routers - Gateway - Routing algorithms - TCP/IP Network, Transport and Application Layers of TCP/IP - World Wide Web.		

1. Recommended Texts

i.Behrouz and Forouzan,2001,Introduction to Data Communication and Networking, 2nd Edition,TMH.

2. Reference Books

i.Jean Walrand 1998,Communication Networks (A first Course),Second Edition, WCB/McGraw Hill.

ii. Behrouz and Forouzan,2006,Data Communication and Networking,3nd Edition, TMH.

Title of the Course/	**Paper -XIX**	**SOFTWARE TESTING**	
Core	**III Year & Sixth Semester**	Credit:4	
Objective of the course	This course introduces the basic concepts of software testing		
Course outline	Unit-1: Introduction: Purpose – Productivity and Quality in Software – Testing Vs Debugging – Model for Testing – Bugs – Types of Bugs – Testing and Design Style.		
	Unit-2: Flow/Graphs and Path Testing – Achievable paths – Path instrumentation – Application – Transaction Flow Testing Techniques		
	Unit-3: Data Flow Testing Strategies - Domain Testing: Domains and Paths – Domains and Interface Testing .		
	Unit-4: Linguistic –Metrics – Structural Metric – Path Products and Path Expressions. Syntax Testing – Formats – Test Cases .		
	Unit-5 : Logic Based Testing – Decision Tables – Transition Testing – States, State Graph, State Testing.		

1. Recommended Texts

    i. B. Beizer , 2003, Software Testing Techniques, II Edn., DreamTech India, New Delhi.

    ii. K.V.KK. Prasad , 2005, Software Testing Tools, DreamTech. India, New Delhi.

2. Reference Books

    i. Burnstein, 2003, Practical Software Testing, Springer International Edn.

    ii. E. Kit, 1995, Software Testing in the Real World: Improving the Process, Pearson Education, Delhi.

iii. R.Rajani, and P.P.Oak, 2004, Software Testing, Tata Mcgraw Hill, New Delhi.

Title of the Course/	**Paper –XX Practical – VI -WEB APPLICATIONS LAB**		
Core	**III Year & Sixth Semester**	Credit: 4	
Objective of the course	This course gives training in web design and applications.		
Course outline			

VB SCRIPT & JAVASCRIPT

1. Write a program outputs the squares, roots, cubes and complements of integers
    between 1 and 100.
2. Create a calculator.
3. Write a script to Sort numbers and strings
4. Create a program to generate a hit counter
5. Create a program to verify whether email address provided by user is valid or invalid.
6. Write a program to scroll the text on status bar.
7. The form consists of two multiple choice list and one single choice list
        a. the first multiple choice list display the major dishes available.
        b. the second Multiple choice list display the stocks available.
        c. The single choice list display the miscellaneous
            (Milkshakes, soft drinks, softy available etc.)
8. Write a sript to create a digital clock.
9. Create a web page using two image file which switch black and white one another as
    the mouse pointer moves over the image. Use the On Mouse over and On Mouse
    event, onDblclick handler
10. Build a WWW page with an image and 3 buttons., Pick three favorite graphics, Label
    the buttons and make each one swap in the graphic you have chosen
11. Create a frameset that has two frames, side by side.

    Make the left-hand frame contain a form with 3 radio buttons

The buttons should be for three search engines:

- Yahoo (http://www.yahoo.com)
- Altavista (http://www.altavista.com)
- Infoseek (http://www.infoseek.com)

When the user clicks on of the option buttons, the frame on the right hand side should be loaded with the right search engine.

12. Write a program to implement Employee database with all validation

ASP

1. Create a login form, to expire, if the user does not type the password within 100 seconds
2. Create an employee database and manipulate the records using command object in ASP
3. Develop an application to illustrate the usage of Request and Response Objects in ASP.
4. Write an ASP program using Request Object to give the exact list of headers sent by the browser to the Web server.
5. Create an Active Server Page to display the records one by one from a student database. The student database should contain roll no, name, marks & total.
7. Design an ASP application that describes books in the Online Bookshop.(Use AD Rotator Component, Content Rotator Component, Content Linking Component)
8. Create a document and add a link to it. When the user moves the mouse over the link it should load the linked document on its own (User is not required to click on the link).
9. Create a document, which opens a new window without a toolbar, address bar, or a status bar that unloads itself after one minute.
10. Create a document that accepts the user's name in a text field form and displays the same the next time when the user visits the site informing him that he has accessed the site for the second time, and so on.

Title of the Course/ Paper	**DATA MINING**		
Elective	**III Year & Sixth Semester**	Credit: 4	
Objective of the course	This course introduces the fundamental concepts of Data Mining.		
Course outline	Unit-1: Introduction: Data mining – Functionalities – Classification – Introduction to Data Warehousing – Data Preprocessing : Preprocessing the Data – Data cleaning – Data Integration and Transformation – Data Reduction		
	Unit-2: Data Mining, Primitives, Languages and System Architecture: Data Mining – Primitives – Data Mining Query Language,. Architectures of Data mining Systems. Concept Description, Characterization and Comparison: Concept Description, Data Generalization and Summarization, Analytical Characterization, Mining Class Comparison – Statistical Measures.		
	Unit-3: Mining Association Rules : Basics Concepts – Single Dimensional Boolean Association Rules From Transaction Databases, Multilevel Association Rules from transaction databases – Multi dimension Association Rules from Relational Database and Data Warehouses.		
	Unit-4: Classification and Prediction: Introduction – Issues – Decision Tree Induction – Bayesian Classification – Classification of Back Propagation. Classification based on Concepts from Association Rule Mining – Other Methods. Prediction – Introduction – Classifier Accuracy.		

	Unit-5: Cluster Analysis: Introduction – Types of Data in Cluster Analysis, Petitioning Methods – Hierarchical Methods Density Based Methods – GRID Based Method – Model based Clustering Method.

1. Recommended Texts

i.J.Han and M. Kamber,2001,Data Mining Concepts and Techniques,Harcourt India Pvt. Ltd - New Delhi.

2. Reference Books

i. K.P. Soman , Shyam Diwakar, V.Ajay ,2006, Insight into Data Mining Theory and Practice, Prentice Hall of India Pvt. Ltd - New Delhi.

3. Website, E-learning resources

 i http:// www.academicpress.com
 ii. http://www.mkp.com

Title of the Course/ Paper	**E-COMMERCE**		
Elective	**III Year & Sixth Semester**	Credit: 4	
Objective of the course	This course gives an exposure to the Electronic Commerce		
Course outline	Unit-1: Electronic Commerce and Opportunities : Background The Electronic Commerce Environment – Electronic Marketplace Technologies – Modes of Electronic Commerce: Overview : Electronic Data Interchange.		
	Unit-2:. Approaches to Safe Electronic Commerce . Overview – Secure Transport Protocols – Secure Transaction – Secure Electronic Payment Protocol (SEPP) – Secure Electronic Transaction (SET)		
	Unit-3:. Certificates for Authentication – Security on Web Servers – Payment Schemes: Internet Monetary Payment and Security Requirements- Payment and purchase order process – Online electronic cash.		
	Unit-4:.Internet / Intranet Security Issues and Solutions : The Need for Computer Security – Specific Intruder Approaches – Security Strategies-Security Tools – Encryption – Enterprise Networking and Access to the Internet Antivirus Programs.- Security Teams		

	Unit-5: MasterCard/Visa Secure Electronic Transaction : Introduction – Business Requirements – Concepts – payment Processing. E-mail and secure e-mail technologies for Electronic Commerce: Introduction _ The Means of Distribution – A model for Message Handling- MIME, S/MIME, MOSS , MIME and Related Facilities for EDI over the Internet.

Recommended Texts:

Daniel Minoli & Emma Minoli, "Web Commerce Technology Handbook". Tata McGraw Hill – 1999.

Reference Book:

1.K.Bajaj & D Nag , "E-Commerce", Tata McGraw Hill – 1999.
2.Mamta Bhusry – "E-Commerce"

Title of the Course/ Paper	**OBJECT ORIENTED ANALYSIS AND DESIGN**		
Elective	**III Year & Sixth Semester**	Credit: 4	
Objective of the course	This course introduces to UML, object oriented analysis and design of any application		
Course outline	Unit-1: System Development - Object Basics - Development Life Cycle - Methodologies - Patterns - Frameworks - Unified Approach - UML.		
	Unit-2: Use-Case Models - Object Analysis - Object relations - Attributes - Methods - Class and Object responsibilities - Case Studies.		
	Unit-3: Design Processes - Design Axioms - Class Design - Object Storage - Object Interoperability - Case Studies.		
	Unit-4: User Interface Design - View layer Classes - Micro-Level Processes - View Layer Interface - Case Studies.		
	Unit-5 : Quality Assurance Tests - Testing Strategies - Object orientation on testing - Test Cases - test Plans - Continuous testing - Debugging Principles - System Usability - Measuring User Satisfaction - Case Studies.		

Recommended Texts

1. Ali Bahrami - Object Oriented Systems Development - McGraw Hill International Edition - 1999.
2. Grady Booch- Object Oriented Analysis and design –Addison Wesley.

ELECTIVE III

Title of the Course/ Paper	**MULTIMEDIA SYSTEMS**		
Elective	**III Year & Sixth Semester**	Credit: 4	
Objective of the course	This course gives an exposure to Multimedia and its applications.		
Course outline	Unit-1: What is Multimedia: Definitions - CD-ROM and the Multimedia Highway - Where to use Multimedia - Introduction to Making Multimedia: The stages of a Project - What You Need - Multimedia Skills and Training: The team - Macintosh and Windows Production Platforms: Macintosh Versus PC - The Macintosh Platform - The Windows Multimedia PC Platform - Networking Macintosh and Windows Computers- Hardware Peripherals: Connection - Memory and Storage Devices - Input Devices - Output Hardware - Communication Devices.		

	Unit-2: Basic Tools**:** Text Editing and Word Processing Tools - OCR Software - Painting and Drawing Tools - 3-D Modeling and Animation Tools - Image-Editing Tools - Sound Editing Tools - Animation, Video and Digital Movie Tools - Helpful Accessories - Making Instant Multimedia: Linking Multimedia Objects - Office Suites - Word Processors - Spreadsheets - Databases - Presentation Tools**.** Multimedia Authoring Tools: Types of Authoring Tools - Card-and-Page-Based Authoring Tools - Icon-Based Authoring Tools - Time-Based Authoring Tools - Object-Oriented Authoring Tools - Cross-Platform Authoring Notes
	Unit-3: Text: The Power of Meaning - About Fonts and Faces - Using Text in Multimedia - Computers and Text - Font Editing and Design Tools - Hypermedia and Hypertext - Sound**:** The Power of Sound - Multimedia System Sounds - MIDI Versus Digital Audio - Digital Audio - Making MIDI Audio - Audio File Formats - Working with Sound on the Macintosh - Notation Interchange File Format (NIFF) - Adding Sound to Your Multimedia Project - Toward Professional Sound: The Red Book Standard - Production Tips
	Unit-4: Images: Making Still Images -Color - Image File Formats. Animation: The Power of Motion - Principles of Animation - Making Animations That Work - Video**:** Using Video - How Video works - Broadcast Video Standards - Integrating Computers and Television - Shooting and Editing Video - Video Tips - Recording Formats - Digital Video.
	Unit-5**:.** Planning and Costing **:** Project Planning - Estimating - RFPs and Bid Proposals **-** Designing and Producing **:** Designing - Producing - Content and Talent **:** Acquiring Content - Using Content Created by Others - Using Content Created for a Project - Using Talent - Delivering **:** Testing - Preparing for Delivery - Delivering on CD-ROM - Compact Disc Technology - Wrapping It Up - Delivering on the World Wide Web.

Recommended Texts:

a. Tay Vaughan - Multimedia: Making it Work. - Fourth Edition - Tata McGraw Hill Edition - 1999.
b) Walterworth John A - Multimedia Technologies and Application - Ellis Horwood Ltd. - London - 1991.
c) John F Koegel Buford - Multimedia Systems - Addison Wesley - First Indian Reprint - 2000.

Title of the Course/ Paper	**CLIENT / SERVER COMPUTING**		
Elective	**III Year & Sixth Semester**	Credit:4	
Objective of the course	This Subject deals with the C/S Computing, GUI.		
Course outline	Unit-1: Introduction to Client/Server Computing – What is Client/Server Computing – Benefits of Client/Server Computing – Evolution of C/S Computing – Hardware Trends – Software Trends-Evolution of Operating Systems – N/w Trends – Business Considerations.		
	Unit-2: Overview of C/S Applications: Components of C/S Applications – Classes of C/S Applications – Categories of C/S Applications . Understanding C/S Computing : Dispelling the Myths – Obstacles – Upfront & Hidden – Open Systems & Standards – Standards – Setting Organizations – Factors of Success.		

	Unit-3: The Client Hardware & Software : Client Component – Client Operating Systems – What is GUI – Database Access – Client Software Products : GUI Environments – Converting 3270/5250 Screens – Database Tools – Client Requirements : GUI Design Standards – Open GUI Standards – Interface Independence – Testing Interfaces .
	Unit-4: The Server : Categories of Servers – Features of Server Machines – Classes of Server Machines – Server Environment : N/W Management Environment – N/W Computing Environment – Extensions – Network Operating System – Loadable Module.
	Unit-5 : Server Operating System : OS/2 2.0 – Windows New Technology – Unix Based OS – Server Requirements : Platform Independence – Transaction Processing – Connectivity – Intelligent Database – Stored Procedure – Triggers – Load Leveling – Optimizer – Testing and Diagnostic Tools – Backup & Recovery Mechanisms.

1. Recommended Texts

1.Patrick Smith & Steave Guengerich, "Client/Server Computing". PHI

2. Dawna Travis Devire, "Client/Server Computing". TMH

Title of the Course/ Paper	**DISTRIBUTED COMPUTING**		
Elective	**III Year & Sixth Semester**	Credit: 4	
Objective of the course	This course introduces the concepts of Distributed databases and Distributed File system and its Hardware concepts..		
Course outline	Unit-1: Distributed data base – Security and Integrity – New Data base application – Design of data bases – Knowledge based case studies for relational network and hierarchical systems. Distributed processing – Models for distributed computing – Load balancing – Remote procedure calls – process migration – concurrency issues on data bases.		
	Unit-2: Hardware concepts – Switched multiprocessor, Bus based multicomputers, Switched multicomputers – Software concepts – Network operating systems and NFS – Time distributed systems.- Design Issues : Transparency – Flexibility – Reliability – performance and scalability.		

	Unit-3: Communications in distributed systems – The client – server model, Blocking vs Unbuffered primitives - Implementation of client-server model.
	Unit-4: Synchronization in distributed systems – Clock synchronization – Mutual exclusion – Election algorithms – Atomic transactions – Deadlocks in distributed system – Threads – Thread usage and Implementation of thread packages – processor allocation.
	Unit-5 : Distributed File system : File service interface – semantics of the file sharing – Distributed file system – Implementation of new trends in distributed file systems.

1.Recommended Texts
  i. A.S Tanenbaum, " Modern Operating Systems " , Pearson Education

2.. Reference Books
   i.James Martin, " Computer Networks and Distributed Processing, Software
   Techniques and Architectures", Pearson Education.