

VEER NARMAD SOUTH GUJARAT UNIVERSITY

Revised syllabus

B.C.A.

Semester III

Effective from year 2007-08

VEER NARMAD SOUTH GUJARAT UNIVERSITY
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Semester - III
Effective from year 2007-08
Teaching and Evaluation Scheme

Paper No	Paper Title	Teaching Scheduled	University Exam Theory/Practical		Internal Examination Theory/Practical		Total Theory/ Prac.
		Lect/Prac. (In Hours)	Duration (Hours)	Marks	Duration (Hours)	Marks	
301	Computer Oriented Numerical and Statistical Methods	4.5	3	70	2	30	100
302	Database Management Systems	4.5	3	70	2	30	100
303	ADVANCE 'C' & Data Structures	4.5	3	70	2	30	100
304	Object Oriented Programming	4.5	3	70	2	30	100
305	Software Engineering	4.5	3	70	2	30	100
306	Practical(Based on 302 to 304)	9	5	140	3	60	200
	TOTAL	31.5		490		210	700

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Paper – 301

Computer Oriented Numerical and Statistical Methods

L : 4.5 Hrs

Prerequisite : Programming Methodology & Computer language

Aim & Objective : To Teach implementation numerical and statistical methods.

1. Numerical Methods

- 1.1 Introduction
- 1.2 Errors in numerical calculations
- 1.3 Solution of algebraic and transcendental equations
- 1.4 Methods like bisection, iteration, false position, Newton Rapson
- 1.5 Interpolation for equal and unequally spaced points
- 1.6 Numerical differentiation and integration
- 1.7 Solution of linear system of equations by gauss elimination gauss serial methods

2. Statistical Methods

- 2.1 Introduction
- 2.2 Presentation of statistical data
 - 2.2.1 Types of variables
 - 2.2.2 Univariate, bivariate and multivariate data
 - 2.2.3 Univariate and bivariate frequency distributions
- 2.3 Measure of central tendency-mean, median and mode
- 2.4 Measures of dispersion (absolute as well as relative)
 - 2.4.1 Mean deviation
 - 2.4.2 standard deviation
 - 2.4.3 coefficient of mean deviation and coefficient of variation
- 2.5 Correlation
 - 2.5.1 introduction
 - 2.5.2 Types of correlation and scatter diagrams
 - 2.5.3 Rank correlation coefficient
- 2.6 Regression
 - 2.6.1 concept of dependent and independent variables
 - 2.6.2 introduction to liner regression
 - 2.6.3 line of regression (with one independent variable)

- Methods should be explained conceptually and corresponding examples should be given. No proof should be given to any of the methods

Reference Books :

1. S.S.Sastry, Introductory methods of Numerical Analysis – PHI
2. Introduction to mathematical statistics – Hogg RV & Cragg AL Tata McGraw Hill
3. An introduction to the theory of statistics – Yule UG & Kendall MG – Charles Griffin & Co.

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Paper – 302

Database Management Systems

Aim & Objective : To teach concepts of DBMS

L : 4.5 Hrs

1. Introduction to Database Systems

- 1.1 Drawbacks of Conventional File Processing System
- 1.2 Need of Database Management System
- 1.3 Organization of database (Physical, Conceptual, Logical)
- 1.4 Data Models
 - 1.4.1 Object based data models: E-R Model
 - 1.4.1.1 E-R diagram
 - 1.4.1.2 Entities and entity sets
 - 1.4.1.3 Types of relationships
 - 1.4.2 Record based data models: Network, Hierarchical & Relational
 - 1.4.3 Physical data models
- 1.5 Components of Data Base Management System
 - 1.5.1 Query Language: DDL, DML, TCL
 - 1.5.2 Database Users: DBA, Programmer, Other Users
- 1.6 Functional Dependencies & Closure of Functional Dependencies
- 1.7 Keys: Super Key, Candidate Key, Primary Key, Alternate Key, Foreign Key
- 1.8 Data independence: Logical & Physical
- 1.9 Constraints
 - 1.9.1 Domain Integrity
 - 1.9.2 Referential Integrity
 - 1.9.3 Entity Integrity

2. Relational database design

- 2.1 Structure of Relational Database Model
- 2.2 Normalization
 - 2.2.1 First normal form
 - 2.2.2 Second normal form
 - 2.2.3 Third normal form
 - 2.2.4 BCNF

3. Commercial RDBMS: Microsoft Access

- 3.1 Working with databases & tables

3.2 Managing constraints & relationships

3.3 Using SQL queries

Reference Books:

1. Database system concepts – Henry F.Korth & Abraham Silberschatz-IMR
2. Introduction to Database management system – Bipin.C. Desai-Galgotia
3. Principles of database systems- Jeffery Ullman-Galgotia Publication
4. An introduction to database systems – C.J.Date-Addison-Wesley
5. Introduction to database management – Navin Prakash – TM
6. Access – The Complete Reference - Virginia Andersen - McGraw-Hill
7. Access Database Design & Programming - Steven Roman - O'Reilly
8. ABC of Microsoft Access: Cowart Robert: BPB publication

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Paper – 303

ADVANCE 'C' & Data Structures

Prerequisite : Programming Methodology & language

L : 4.5 Hrs

Aim & Objective: Implementation of Data Structures

1. User defined Functions

- 1.1 Call by value and by reference
- 1.2 Passing structures and array
- 1.3 Recursion

2. Pointers

- 2.1 Pointers and memory storage
- 2.2 Operation on pointers
- 2.3 Arrays of pointers
- 2.4 Passing pointers to functions

3. Primitive data structures

4. Non - Primitive data structures

- 4.1 Arrays - its storage structures and operations
- 4.2 Stacks.
 - 4.2.1 Operations on stack
 - 4.2.2 Its applications in recursion and polish expressions etc.
- 4.3 Queues
 - 4.3.1 Types of queues
 - 4.2.2 Operations on queue
 - 4.2.3 Its application
- 4.4 Linked list
 - 4.4.1 Types of Limited Lists
 - 4.4.2 Operations on linked list
 - 4.4.3 Its applications

5. Sorting & Searching Techniques.

- 5.1 Internal sorting : Insertion, Selection, Quick , 2-way merge, bubble
- 5.2 Searching :- Sequential, Binary.

Reference Books:

1. An introduction to Data Structures with applications – T rembley – McGraw Hill
2. Algorithms – Data Structure Programs – Wirth, Niclaus – PHI
3. Fundamentals of Data Structures, Horwitz, E. and Sahni – Computer Science Press.
4. The art of Computer Programming, Vols, 1-2, Kunth D – Addision Wessley
5. Schaum's outline of Data Structure with C++, John R.H. –TMH
6. Expert Data structure with C-R,B.Patel, Khanna Publication
7. The Complete Reference 'C' -Fourth Edition - Herbert Schildt - Tara MC Graw Hill
8. Programming Language in 'C' Gotfried -Tata MC Graw Hill.

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Paper – 304

Object Oriented Programming

Prerequisite : Programming Language C

L : 4.5 Hrs

Aim & Objective : To teach Object Oriented Concepts

1. Overview : Pointers and self referential structures
2. Principles of object oriented programming
 - 2.1 Procedures oriented programming Vs object oriented programming
 - 2.2 Basic concepts of object oriented programming (Encapsulation, Polymorphism etc)
 - 2.3 Benefits of object oriented programming
3. Classes & Objects
4. Constructors & Destructors
5. Operator overloading, functional overloading & types conversions
6. Inheritance
7. Dynamic polymorphism
8. Data Files

Reference Books :

1. Stroustrup : The C++ Programming Language – Addison Wesley
2. Robert Lofore OOP in Turbo C++ - Galgotia Publication
3. Lippman : C++ Primer – Addison Wesley
4. Probal Sengupta : Object Oriented Programming Fundamentals & Applications – PHI
5. Schildt : The Complete Reference – Osborne

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Paper – 305

Software Engineering

Prerequisite : Programming Methodology

L : 4.5 Hrs

Aim & Objective : To familiarize students with software development Process.

1. Introduction

- 1.1 Software, Software characteristics, Applications, Myths.
- 1.2 Software Engineering ,Generic View
- 1.3 Software Process models: Waterfall, Prototyping
- 1.4 4GL Techniques
- 1.5 Efforts distribution

2. Requirement analysis

- 2.1 Introduction
- 2.2 Requirement gathering techniques
- 2.3 DFD Data Dictionary and Process Specification
- 2.4 Importance of Requirement Specifications
- 2.5 Software Requirement Specification Document

3. System Design

- 3.1 Design model
- 3.2 Principal and Concepts
- 3.3 Functional Independence
- 3.4 Mapping of Requirements into Design
- 3.5 Design Documentation

4. Software Testing

- 4.1 Testing Fundamentals
- 4.2 Functional and Structural Testing
- 4.3 Testing Process

Note: Case studies may be carried out at appropriate stages of the course.

Reference Books:

- 1. R.S.Pressman, Software Engineering – A Practitioners’ approach – McGraw Hill
- 2. Richard Fairley, Software Engineering concepts – McGraw Hill
- 3. Elias M : System Analysis & Design – Galgotia Pub.
- 4. Pankaj Jalota : An integrated approach to software engineering – Narosa.

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Paper – 306

Practical

Practical shall be conducted as mentioned in the Teaching Scheme for Papers 302 to 304.
Separate journals for Paper No.302 to 304 should be prepared. [P: 9 Hrs.]
