Revised syllabus

B.C.A.

Semester III

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

<table>
<thead>
<tr>
<th>Paper No</th>
<th>Paper Title</th>
<th>Teaching Scheduled</th>
<th>University Exam Theory/Practical</th>
<th>Internal Examination Theory/Practical</th>
<th>Total Theory/Prac.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lect/Prac. (In Hours)</td>
<td>Duration (Hours)</td>
<td>Marks</td>
<td>Duration (Hours)</td>
</tr>
<tr>
<td>301</td>
<td>Computer Oriented Numerical and Statistical Methods</td>
<td>4.5</td>
<td>3</td>
<td>70</td>
<td>2</td>
</tr>
<tr>
<td>302</td>
<td>Database Management Systems</td>
<td>4.5</td>
<td>3</td>
<td>70</td>
<td>2</td>
</tr>
<tr>
<td>303</td>
<td>ADVANCE ‘C’ &amp; Data Structures</td>
<td>4.5</td>
<td>3</td>
<td>70</td>
<td>2</td>
</tr>
<tr>
<td>304</td>
<td>Object Oriented Programming</td>
<td>4.5</td>
<td>3</td>
<td>70</td>
<td>2</td>
</tr>
<tr>
<td>305</td>
<td>Software Engineering</td>
<td>4.5</td>
<td>3</td>
<td>70</td>
<td>2</td>
</tr>
<tr>
<td>306</td>
<td>Practical(Based on 302 to 304)</td>
<td>9</td>
<td>5</td>
<td>140</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>31.5</td>
<td>490</td>
<td>210</td>
<td>700</td>
</tr>
</tbody>
</table>
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:**

2. Introduction to mathematical statistics – Hogg RV & Cralg AL Tata McGraw Hill
Aim & Objective: To teach concepts of DBMS

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
7. Access Database Design & Programming - Steven Roman - O'Reilly
8. ABC of Microsoft Access: Cowart Robert: BPB publication
VEER NARMAD SOUTH GUJARAT UNIVERSITY
B.C.A. Semester - III
Effective from year 2007-08

Paper – 303

ADVANCE ‘C’ & Data Structures

Prerequisite : Programming Methodology & language

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
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
Object Oriented Programming

Prerequisite : Programming Language C

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
5. Schildt : The Complete Reference – Osborne
VEER NARMAD SOUTH GUJARAT UNIVERSITY
B.C.A. Semester - III
Effective from year 2007-08
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:

VEER NARMAD SOUTH GUJARAT UNIVERSITY
B.C.A.
Semester - III
Effective from year 2007-08
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.]