



# **St. PETER'S UNIVERSITY**

**St. Peter's Institute of Higher Education and Research**

**(Declared Under Section 3 of the UGC Act, 1956)**

**AVADI, CHENNAI – 600 054**

**TAMIL NADU**

**B.C.A. (COMPUTER APPLICATIONS)**

**Code No. - 327**

**(Effective From 2009 – 2010)**

**(Distance Education)**

**Regulations and Syllabi**

**(I & II & III Year)**

**St. PETER'S INSTITUTE OF DISTANCE EDUCATION**

**Recognized by Distance Education Council and**

**Joint Committee of UGC – AICTE - DEC, New Delhi**

**(Ref. F. No. DEC/SPU/CHN/TN/Recog/09/14 dated 02.04.2009 and**

**Ref.F.No.DEC/Recog/2009/3169 dated 09.09.2009)**

**St. PETER'S UNIVERSITY**  
**St. PETER'S INSTITUTE OF DISTANCE EDUCATION**  
Chennai – 600 054.

**Code No. – 327**  
**B.C.A (COMPUTER APPLICATIONS)**  
(Distance Education)

**Regulations and Syllabi**  
(Effective from 2009 – 2010)

- 1. Eligibility:** Candidates who have passed the Higher Secondary Examination conducted by the Government of Tamilnadu with Mathematics (Academic stream or Vocational stream) as one of the subjects or any other examination recognized as equivalent thereto are eligible for admission to Three Year B.Sc Programme in Computer Applications.
- 2. Duration:** Three Years.
- 3. Medium:** English is the medium of instruction and examination.
- 4. Methodology:** The methodology of distance education includes the supply of self-instructional study materials in print format and in CD, face-to-face instruction for theory and practicals for a limited period during week ends and on holidays, provision of virtual class in phased manner, dissemination of information over e-mail, Student - Support Service at various Centres of the University, Continuous Assessment and End Assessment conducted by the University at various parts of India.
- 5. Weightage for Continuous and End Assessment:** There is no weightage for Continuous Assessment unless the ratio is specifically mentioned in the scheme of Examinations. The End Assessment (EA) has 100% weightage.

**6. Credit System:** Credit system be followed with 36 credits for each Year and each credit is equivalent to 25 hours of effective study provided in the Time Table of the formal system.

## 7. Scheme of Examinations

### First Year

Code No.	Course Title	Credit	Marks	
			EA	Total
<b>Theory</b>				
109UTMT01	Tamil - I	6	100	100
109UHIT01	Hindi - I			
109UEHT02	English - I	6	100	100
109UCAT03	Digital Computer Fundamentals	6	100	100
109UCAT04	Programming Language COBOL	6	100	100
109UCAT05	Allied – I Allied Mathematics	6	100	100
109UCAP01	Practical – I Programming in COBOL Record	6	90 10	100
<b>Total</b>		<b>36</b>	<b>600</b>	<b>600</b>

### Second Year

Code No.	Course Title	Credit	Marks	
			EA	Total
<b>Theory</b>				
209UCAT01	System Analysis and Design	6	100	100
209UCAT02	Relational Data Base Management System	6	100	100
209UCAT03	Programming Language C and Data Structure	6	100	100
209UCAT04	Object Oriented Programming with C++	6	100	100
209UCAT05	Allied –II Management Accounting	6	100	100
209UCAP01	Practical – II Programming in C and C++ Using Data Structure and OOPS Record	6	90 10	100
<b>Total</b>		<b>36</b>	<b>600</b>	<b>600</b>

### Third Year

Code No.	Course Title	Credit	Marks	
			EA	Total
<b>Theory</b>				
309UCAT01	E-Commerce	6	100	100
309UCAT02	Operating System	6	100	100
309UCAT03	Programming Language VISUAL BASIC	6	100	100
309UCAT04	Programming Language JAVA and JAVA SCRIPT	6	100	100
309UCAP01	Practical – III Programming in VISUAL BASIC Record	6	90 10	100
309UCAP02	Practical – IV Programming in JAVA and JAVA SCRIPT Record	6	90 10	100
<b>Total</b>		<b>36</b>	<b>600</b>	<b>600</b>

**8. Passing Requirements:** The minimum pass mark (raw score) be 40% in End Assessment.

**9. Grading System:** Grading System on a 10 Point Scale be followed with 1 mark = 0.1 and the conversion of the Grade point as given below.

$$\begin{aligned}
 \text{Overall Grade Point Average (OGPA)} &= \frac{\text{Sum of Weighted Grade Points}}{\text{Total Credits}} \\
 &= \frac{\sum (EA)C}{\sum C}
 \end{aligned}$$

**The Overall Grade:** The Overall Grade and Classification of all successful candidates be arrived at from the Overall Grade Point Average as stipulated in the following conversion Table.

<b>Grade</b>	<b>Over all Grade Point Average(OGPA)</b>	<b>Over all weighted Average marks</b>	<b>Classification</b>
0	9.0 to 10.0	90 to 100	First Class
A	8.0 to 8.9	80 to 89	First Class
B	7.0 to 7.9	70 to 79	First Class
C	6.0 to 6.9	60 to 69	First Class
D	5.0 to 5.9	50 to 59	Second Class
E	4.0 to 4.9	40 to 49	Third Class
<b>F</b>	0.0 to 3.9	0 to 39	<b>Reappearance</b>

The Grade Sheets of all candidates provide such as  
(1) Overall weighted Average Marks and (2) Overall Grade.

**10. Pattern of the Question Paper:** The question paper for the End Assessment will be set for three hours and for a maximum of 100 marks with following divisions and details.

**Part A:** 10 questions (with equal distribution to all the units in the syllabus). Each question carries 2 marks.

**Part B:** 5 questions with either or type (with equal distribution to all the units in the syllabus).

Each question carries 16 marks.

The total marks scored by the candidates will be reduced to the maximum prescribed in the Regulations.

## **11. Syllabus**

**FIRST YEAR**  
**109UCAT03: DIGITAL COMPUTER FUNDAMENTALS**

**Unit I**

Introduction to Computers: Introduction – Types of Computers – Characteristics of Computers – Word length – Speed – Storage – Accuracy – Versatility – Automation – Diligence. Five generations of Modern Computers: First Generation Computers – Second Generation Computers – Third Generation Computers – Fourth Generation Computers – Fifth Generation Computers. Number System: Introduction – Decimal Number System – Binary number System – Binary to Decimal Conversion – Decimal to Binary Conversion – Binary Addition – Binary Subtraction – Complements- 9's, 10's, 1's, 2's – Octal Number System – Hexadecimal Number System.

**Unit II**

Boolean Algebra and Gate Networks: Fundamental concepts of Boolean Algebra – Logical Multiplication – AND Gates and OR Gates – Complementation and Inverters – Evaluation of Logical Expressions – Evaluation of an Expression containing parentheses – Basic Laws of Boolean Algebra – Simplification of expressions – De Morgan's Theorems – Basic Duality of Boolean Algebra – Derivation of a Boolean Expression – Interconnecting Gates – Sum of Products and Products of Sum – Derivation of Products of Sums expression – NAND gates and NOR gates – The Map method for simplifying expressions – Sub Cubes and covering – Product of Sums. Expressions – Don't cares.

**Unit III**

Anatomy of a digital computer: Functions and Components of a Computer – Central Processing Unit-control Unit – arithmetic Logic Unit – Memory – Registers – Addresses- How the CPU and Memory Work. Memory Units: Introduction – RAM- ROM – PROM – EPROM – EEPROM – Flash memory. Input Devices – Output Devices Auxiliary Storage Devices: Introduction – Magnetic Tape – Hard Disk – Floppy Disk – CD – ROM – CD –R Drive – CD –RW Disks.

**Unit IV**

Combinational logic adders, subtractors, decoders, encoders, multiplexer, demultiplexer – Flip flops – Registers – Shift Register – Counters.

**Unit V**

Computer Design – System configuration – Computer instructions – Design of Computer registers – Design of control – Computer console.

**TEXT BOOK:**

1. "Fundamentals of Computer Science and Communication Engineering" – Alexis Leon, Mathew's Leon (Unit I & III).
2. "Digital Computer Fundamentals" – Thomas C. Bartee( Unit II & IV ).
3. "Microprocessor Architecture Programming and Application with the 8085", Ramesh Goankar, (Unit III & V).

# **109UCAT04: PROGRAMMING LANGUAGE COBOL**

## **Unit I**

Introduction to COBOL language – Rules, conventions and definition COBOL divisions – Identification division, Environment division, Data division with editing features.

## **Unit II**

Procedure division – verbs for the concepts and programming preliminaries – OPEN, CLOSE, READ, WRITE – DATA movement verb – Arithmetic Verbs – ADD, SUBTRACT, MULTIPLY, DIVIDE, COMPUTE.

## **Unit III**

Conditional and sequence control verbs – Relational condition, sign, class, condition – name, compound conditions and IF sentence – More about data division clauses – REDEFINES, Renames, Justified, Qualification of data name, SIGN, SYNCHRONIZED, CORRESPONDING option.

## **Unit IV**

Table handling with perform verb – Times option, until, varying – After option, Indexed table with indexing, SET, SEARCH verb, sorting a table.

## **Unit V**

File – Sequential and Direct access file features – simple illustrative programs.

## **TEXT BOOK:**

1. "Programming in COBOL, Rajaraman V., PHI, New Delhi.
2. "COBOL Programming Including MS – COBOL and COBOL – 85"  
M.K.Roy, D.Ghosh Dastidar, TMH, New Delhi.

# ALLIED – I

## 109UCAT05: ALLIED MATHEMATICS

### Unit I

Characteristic Equation – Eigen values and Eigen vectors – properties – problems – Rank of a matrix – problems – solutions of simultaneous equations using matrices – Consistency condition. Polynomial equations – relation between roots and coefficients – Imaginary roots and irrational roots – solving equations under given conditions – Transformation of equations.

### Unit II

Definition of a derivative, different types of differentiation – Standard Formulae – Successive differentiation –  $n^{\text{th}}$  derivative – Leibnitz formulae – problems. Partial differentiation – Euler's theorem – Curvature – Radius of Curvature in Cartesian co-ordinates.

### Unit III

Integration by parts -  $\int_0^{\pi/2} \sin^n x \, dx$ ,  $\int_0^{\pi/2} \cos^n x \, dx$ ,  $\int_0^{\pi/2} \sin^n x \, dx$ ,  $\int x^n e^{ax} \, dx$ ,  $\int e^{-x} x^n \, dx$ , Definite integrals – properties – reduction formulae – problems. Second order differential equations with constant coefficients – particular integrals of the type  $e^{ax} V$  – where  $V$  is  $x$  or  $x^2$  or  $\cos ax$  or  $\sin ax$ .

### Unit IV

Definition – complete, +- singular and general integrals solutions of standard types  $f(p, q) = 0$ ,  $f(x, p, q) = 0$ ,  $f(y, p, q) = 0$ ,  $f(z, p, q) = 0$ ,  $f_1(x, p) = f_2(x, p)$  – clariant's form – lagrange's equation  $Pp + Qq = R$ -problems.

### Unit V

Definition – laplace transform of standard functions – simple theorems – problems – inverse laplace transform – fourier coefficients – periodic functions with period  $2p$  – half range series – cosine series – sine series – problems.

### TEXT BOOK:

1. T.K. Manickavasagam pillai – ALLIED MATHEMATICS, S. Viswanathan & Co, Chennai.
2. P.R. Vittal - ALLIED MATHEMATICS, Margham Publications, Chennai.
3. A. Singaravelu - ALLIED MATHEMATICS, Meenakshi Traders, Chennai.

**PRACTICAL – I**  
**109UCAP01: PROGRAMMING IN COBOL**

**COBOL PROGRAMMING LIST:**

1. Finding Sum of N Natural Numbers.
2. Program to Calculate the Simple and Compound Interest.
3. Program to Sort N Numbers in Ascending / Descending Order.
4. Program to Add / Subtract two Matrices.
5. Program to Multiply two Matrices.
6. Program to Inventory Control.
7. Preparation of Mark Sheet / Exam Result Processing.
8. Program for Electricity Bill Preparation.
9. Program for Library Information System – Updating Issues and Receipts.
10. Sequential Files-Sorting / Merging.

# **209UCAT01: SYSTEM ANALYSIS AND DESIGN**

## **Unit I**

Introduction to Information System Development: What is System Analysis and Design? – Business System concepts – Categories of Information systems – System development Strategies. Managing the application development portfolio : How system projects have begun – Managing project review and selection – Preliminary investigation – Selecting the project development strategies.

## **Unit II**

Tools for determining system requirement: What is requirements determination? – Fact finding techniques – Tools for documenting procedure and decision. Structured Analysis development strategies: Structured Analysis – Developing Data flow diagrams. Computer Aided Systems Tools: Role of Tools – Categories of automated Tools – CASE Tools – Benefits of CASE.

## **Unit III**

The Analysis to design transitions : Specifying Application requirements – Objectives in designing Information systems – What features must be designed? Design of computer output : How to identify computer Output needs – How to present information – Designing printed output – Designing visual concerns guide input design – Capturing data for input – Input validation.

## **Unit IV**

Design of online dialogue: How is online different? – What is an interface – Designing dialogue – Dialogue strategy – Data entry dialogues. Design of files and use of auxiliary storage devices: Basic file terminology – Data Structure Diagrams – Types of files – Methods of file organization.

## **Unit V**

Systems Engineering and Quality assurance: Design objectives – Program structure charts – Design of Software – Managing Quality assurance – Managing testing practices. Managing system implementation: Training – Conversion – post implementation review. Managing information systems development : Estimation and management of development time – Estimation – Personnel and development management. Hardware and Software selection : Hardware selection – Software Selection.

## **TEXT BOOK:**

1. " Analysis and Design of Information Systems" - Second Edition  
James A. Senn, TMH, New Delhi.

# **209UCAT02: RELATIONAL DATABASE MANAGEMENT SYSTEM**

## **Unit I**

Introduction : Purpose of Database systems – View of data – Data models – Database languages – Transaction management – Storage management – Database Administrator – Database users – Overall System Structure. Entity relationship model: Basic concepts – keys – Entity relationship Diagram – Weak entities sets – Extended ER features : Specialization – Generalization. Relational model : Structure of relational databases – The relational Algebra – views.

## **Unit II**

SQL: Background – Basic Structure – Set operations – Aggregate functions – null values – Nested sub queries – Derives Relations – views – modification of database – joined relations – data definition languages – Embedded SQL – other SQL features.

## **Unit III**

Integrity constraints: Domain constraints – Referential Integrity – Assertions – Triggers – Functional Dependencies. Relational Database Design: Pitfalls in Relational Database Design – Decomposition – Normalization using functional dependencies – Normalization using Multilevel Dependencies – Normalization using Join Dependencies. Object Oriented Databases: New Database Applications – The Object Oriented Data Model – Object Oriented Languages – Persistent Programming Languages.

## **Unit IV**

Object Relational Databases: Nested relations – Complex types and Object Orientation – Querying with complex Data types – Creation of complex values and objects – Comparison of Object – Oriented Relational databases.

## **Unit V**

New Applications : Decision support systems – Data Analysis – Data mining – Data warehousing – Spatial and Geographic Databases – Multimedia Databases – Mobility and personal Databases – Information – Retrieval systems – Distributed information systems – The World Wide Web.

## **TEXT BOOK:**

1. "Database System Concepts" Abraham Silberschatz, Hendry F. Korth, S. Sudharshan, Third Edition, McGraw Hill International Edition – 1997.

## **209UCAT03: PROGRAMMING LANGUAGE C AND DATA STRUCTURE**

### **Unit I**

Overview of C: History of C – Importance of C – Basic Structure of C Programs. Constants, Variables and Data Types. Operators and Expression Managing Input and Output Operations: Reading and Writing a Character – Formatting Input and Output . Decision Making and Branching: IF, IF-ELSE, Nesting of IF, IF-ELSE, ELSE-IF Ladder, Switch Statements – GOTO Statements. Decision Making and Looping: WHILE Statement – DO Statement – FOR Statement.

### **Unit II**

Structure and Unions – Arrays: Definition – One-Dimensional Arrays – Declaration of One-Dimensional Arrays – Initialization of One-Dimensional Arrays - Two-Dimensional Arrays – Initialization of Two-Dimensional Arrays – Multidimensional Arrays – Dynamic Arrays.

### **Unit III**

Character Arrays and Strings: Introduction – Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to screen – String Handling Functions – Pointers – Files – Opening / Closing files – file – Input / Output – Error Handling during I/O Operations – Random Access to files – Command Line Arguments.

### **Unit IV**

Data Structures: Definition – Categories of Data Structures – Arrays: Array operations – Merging of Two Arrays – Two Dimensional Arrays.

Stacks: Definition – Operations on Stack – Representation of a Stacks as an array – Representation of a Stack as a Linked List – Evaluation of expression : Infix to Prefix conversion – Infix to Postfix conversion.

Queues: Definition – Operations on Queue – Representation of Queue as an array – Representation of Queue as an array – Representation of Queue as an linked list – Circular Queues.

Linked List: Definition – Operations on linked list – Circular list – Doubly linked list – Operations on doubly linked list – Polynomial addition.

### **Unit V**

Trees: Definition & Terminology – Binary trees – Traversal of a binary tree: In order, Pre Order and Post Order. Representation of a Binary trees in memory – Linked representation of binary trees – Array representation of binary trees – Operations on a Binary Search tree : Searching Operation – Insertion Operation and Deletion Operation. Forest Tree : Conversion of a Forest Tree to Binary Tree – Graphs : Definition & Terminology – Graph representations – Graph travels : Depth First Search & Breadth first Search. Shortest Path Algorithm ( Using Dijkstra's Algorithm ).

### **TEXT BOOK:**

1. "Programming in ANSI C", E. Balagurusamy.
2. "Data Structures through C", Yashvant Kanethar.

# **209UCAT04: OBJECT ORIENTED PROGRAMMING WITH C++**

## **Unit I**

Principles of Object- Oriented programming: Software Evolution – A Look At Procedure-Oriented Programming – Object-Oriented Programming Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of OOP – Object-Oriented Languages – Applications of OOP.

## **Unit II**

Beginning with C++: What is C++? – Applications of C++ - Structure of C++ Program – A Simple C++ Program – More C++ Statements – An Example with Class. Tokens, Expressions and Control Structures : Introduction – Tokens – keywords – Identifiers and Constants – Basic Data Types – User-Defined Data Types – Derived Data Types – Symbolic Constants – Type Compatibility – Declaration of Variables – Dynamic Initialization of Variables – Reference Variables – Operators in C++ Scope Resolution Operator-Member Dereferencing Operators – Memory Management Operators – Manipulators – Type Cast Operators – Expressions and their Types – Special Assignment Expressions – Implicit Conversions – Operator Overloading – Operator Precedence – control Structures. Functions in C++ : Introduction – The Main Function – Function Prototyping – Call By Reference – Return By Reference – Inline Functions – Default Arguments – Const Arguments – Function Overloading – Friend and Virtual Functions.

## **Unit III**

Classes and Objects : Introduction – Specifying a Class – Defining Member Functions – A C++ Program with Class – Making An Outside Function Inline – Nesting of Member Functions – Private Member Functions – Arrays within a Class – Memory Allocation for Objects – Static Data Members – Static Member Functions – Arrays of Objects – Objects As Function Arguments – Friendly Functions – Returning Objects – Const Member Functions – Pointers to Member – Local classes. Constructors and Destructors : Introduction – Constructors – Parameterized Constructors – Multiple Constructors In a Class – Constructors with Default Arguments - Dynamic Initialization of Objects- Copy Constructor – Dynamic Constructors – Constructing Two-Dimensional Arrays – Const object – Destructors.

## **Unit IV**

Operator Overloading and Type Conversions : Introduction – Defining Operator Overloading – Overloading Unary Operators – Overloading Binary Operators – Overloading Binary Operators Using Friends–Manipulation of Strings using Operators – Rules for Overloading Operators – Type Conversions – Inheritance Extending Classes : Introduction – Defined Derived Classes – Single Inheritance – Making A Private Member Inheritable – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes – Abstract Classes – constructors in Derived Classes – member Classes : Nesting of Classes . Pointers, Virtual Functions and Polymorphism : Introduction – Pointers to objects – this Pointer-Pointer to Derived Classes – Virtual Functions – Pure Virtual Functions.

## **Unit V**

Managing Console I/O Operations: Introduction - C++ Streams - C++ Stream Classes - unformatted I/O Operations - Formatted Console I/O Operations - Managing Output with Manipulators. Working with Files : Introduction - Classes for File Stream Operations - Opening and Closing a File - Detecting End-Of-File-More about Open() : file Modes - File Pointers and their Manipulations - Sequential Input and Output Operations - Updating a File : Random Access - Error Handling during File Operations - Command-Line Arguments. Templates: Introduction - Class Templates - Class Templates with Multiple Parameters - Function Templates - function Templates with Multiple Parameters - Overloading of Template Functions - Member Function Templates. Exception Handling : Introduction - Basics of Exception Handling - Exception Handling Mechanism - Throwing Mechanism - Catching Mechanism - Rethrowing an Exception - Specifying Exceptions.

### **TEXT BOOK:**

1. "Object-Oriented Programming with C++"  
E. Balagurusamy, TMH, New Delhi. Second Edition.

**ALLIED – II**  
**209UCAT05: MANAGEMENT ACCOUNTING**

**Unit I**

Management Accounting – Nature and Scope – Meaning – Definitions – Objects of Management Accounting and Financial Accounting – Management Accounting and cost Accounting.

**Unit II**

Analysis and Interpretation of Financial Statements – The Concept of Financial Statement – Limitations of Financial Statements – Analysis and Interpretation – Tools – Comparative Financial Statements – Common Size financial Statements and Trend Percentages.

**Unit III**

Ratio Analysis – Nature, Interpretation and Limitations of ratios – Short-term and Long-term Financial Ratios – Profitability, Efficiency, Proprietary and Yielding Ratios.

**Unit IV**

Fund Flow Analysis – Concept of Funds – Sources and uses of funds – Concept of Fund Flow Statement – Managerial uses of Fund Analysis Construction of fund flow Statement – Distinction of Cash from funds – Utility of cash flow statement – Construction of cash flow statement.

**Unit V**

Marginal Costing and Break – Even Analysis for Profit Management and control. Capital Budgeting – Nature of Capital Expresses – Concept of capital Budgeting – Capital Budgeting Procedures – methods of Ranking Investment. Proposals – Simple Problems Involving Payback Method – Average Rate Method and Discounted Cash Flow Methods.

**TEXT BOOKS:**

1. "Principles of Management Accounting" S.N. Maheshwari, Sultan & Sons, New Delhi.
2. "Management Accounting" D.R. Ganeshan & S.R. Kalavathi Thirumalai Publication, Nagercoil .

**REFERENCE BOOKS:**

1. "Principles of Management Accounting", Manmohan and S.N. Goyal Sahithya Bhanvnan, Agra.
2. Management Accounting, T.S. Reddy & Hari Prasad Reddy, Margham Publication, Chennai -17.

**PRACTICAL II**  
**209UCAP01: PROGRAMMING IN C AND C++ USING DATA**  
**STRUCTURE AND OOPS**

**LIST OF PRACTICALS:**

**Programming in C using Data Structures**

1. Implement Push Pop Operation of a Stack using
  - a. Arrays
  - b. Pointers
2. Implement Add, Delete Operations of a Queue using
  - a. Arrays
  - b. Pointers
3. Write a Program to create a Doubly Linked List and to Insert or Delete and element from Doubly Linked List.
4. Perform all Tree Traversals for a Binary Tree using Arrays and Recursive.
5. Implement Dijkstra's algorithm to find the shortest path between given Source and Destination path of graph.

**Programming in C++ using OOPs**

6. Classes and Objects
  1. Functions
    - a. Inline Functions
    - b. Friend Functions
    - c. Function with Default Argument
    - d. Virtual Functions
  2. Constructors and Destructors
    - a. Empty Constructor
    - b. Parameterized Constructor
    - c. Constructor with Default Arguments
    - d. Copy Constructors
  3. Polymorphism
    - a. Function Overloading
    - b. Operator Overloading
  4. Inheritance
    - a. Single
    - b. Multilevel
    - c. Multiple
    - d. Hierarchical
    - e. Hybrid

## **THIRD YEAR**

### **309UCAT01: E-COMMERCE**

#### **Unit I**

Electronic Commerce: Electronic Commerce – Electronic Data Interchange – Value Added Networks – Electronic Commerce Over The Internet – Internet Commerce Examples – Commerce Net. PCs and Networking: Networking – Communication Media. Electronic Mail: Computer Communication Systems – ISO’s Open System Interconnection Model – Electronic Mail – E-Mail Security – X.500 Directory Services – Mail User Agent.

#### **Unit II**

The Internet: The Internet: A Brief Introduction – Internet Communication Protocols – Internet Services and Resources – Internet Mail – Internet Search – Concerns about the Internet – Browsers – Hypertext Markup Language – Java – The Java Electronic Commerce Framework – Internet 2. Intranets: Intranet – Intranet Services – Intranet Implementation – The Webmaster. Electronic Data Interchange : Electronic Data Interchange – Costs and Benefits – Components of EDI Systems – EdI Implementation Issues – Legal Aspects.

#### **Unit III**

The UN / EDIFACT Standard: Introduction – An EDIFACT Message – Interchange Structure – UN / EDIFACT Message Directories. The Internet and Extranets for Electronic commerce : E-Commerce – commerce Over the Internet – Commerce Over Extranets. Identification and Tracking Tools for Electronic Commerce: The EAN System - EANCOM – Article. Numbering – Bar Coding – The Serial Shipping Container Code and the EAN label – EAN Location Numbers – How It Works : Warehousing Issues : Bandwidth Issues – Technology Issue for the Internet / NII – NII Standards – NII Services – Actors in the NII – NII Agenda – GII.

#### **Unit IV**

Security Issues: Security Concerns – Security Solutions – Electronic Cash Over The Internet – Security and UN / EDIFACT Messages – Internet Security – Guideliness for Cryptography Policy. Business Process Reengineering: Introduction – Approach to BPR – Strategic Alignment Model – BPR Methodology. Management of Change : Change Management – Change Management in Public Administration – The Implementation Plan.

#### **Unit V**

Legal Issues: Legal Issues – Risks: Paper Document Versus Electronic Document – Technology for Authenticating an Electronic Document – Laws for E-Commerce – EDI Interchange Agreement – Legal Issues for Internet Commerce. E-Commerce in India: EDI in India – The Internet in India – Laws for E-Commerce in India. Getting Started: Getting Connected: What Do You Need? – Setting Up a Website – Web Servers – Business-To-Business EC – Payment for Goods and Services – Bottlenecks.

**CASE STUDIES:**

EDI in Indian Customs – US Electronic Procurement – Banks – EDI Pilot Project in the Automotive Industry.

**TEXT BOOK:**

“E – Commerce – The Cutting Edge of Business “, Kamalesh K Bajaj and Debjani Nag. Fourth Reprint 2000 TMH, New Delhi.

## **309UCAT02: OPERATING SYSTEM**

### **Unit I**

Operating System Overview: Operating System Objectives and Functions – Evaluation of O.S – Major Achievements. Process Description and Control : Process – Process States – Process Description and Control.

### **Unit II**

Threads, Concurrency: Principles of Concurrency – Mutual Exclusion – Semaphores – Message Passing. Deadlock: Principles of Deadlock – Deadlock prevention – Deadlock avoidance – Deadlock detection.

### **Unit III**

Memory Management: Requirements – Memory partitioning – Paging – Segmentation. Virtual memory: Hardware and Control structures – Operating System Software.

### **Unit IV**

Uniprocessor Scheduling: Types of Processor – Scheduling – Scheduling algorithm – Multiprocess Scheduling. I/O Management and Disk Scheduling: I/O devices – Organization of the I/O function – I/O Buffering – Disk Scheduling.

### **Unit V**

File Management: Overview – File organization & Access – File Directories – File Sharing – Record Blocking – Secondary Storage Management.

**Case Studies:** Unix – Process Management, Memory Management, I/O Management & File Management.

### **TEXT BOOK:**

“Operating System – Internals & Design Principles ”  
William Stallings  
Prentice – Hall of India P.Ltd, New Delhi – 110001.  
Fifth Edition.

# **309UCAT03: PROGRAMMING LANGUAGE VISUAL BASIC**

## **Unit I**

Welcome to VB: What is Visual Basic – Features of Visual Basic – Visual Basic Editions – The Visual Basic Philosophy – Developing an Application. Creating an Application: Objectives – The Tool Box – Project Explorer – The Properties Window – The Form Window – Understanding Projects – What Does Visual Basic 6 have for you to Create Applications. Second Look at IDE Forms and Controls : Objectives – The Form – The Working with a Control – Opening the Code Window. Variables in Visual Basic : Objectives – What is a Variable .

## **Unit II**

Writing Code in VB: Objectives – The Code Window – The Anatomy of Procedure – Editor Features – The For..Next Statement – The Decision Maker If-loop – The While Loop – Selective Case ... End Select. Working with Files: objectives – Visual Basic File System Controls – Types of Files – Working with Files.

## **Unit III**

Menus: Objectives – Building the User Interface. The First Step – All about Menus. MDI Applications: Why MDI Forms – Features of an MDI Form – Loading MDI Forms and Child Forms – The Active Form property. Debugging Tips: Objectives - The Debugging Methods. The Common Dialog Control : Working with the Common Dialog Control – The File Open Dialog Box – Saving a File – Changing the Color : Introduction to Databases : Why Databases – What is a Database – Which Database. Working with the Data Control : The Data Control – The Bound Controls – Caution – Coding.

## **Unit IV**

DAO : The Jet Database Engine – Functions of the Jet Database Engine – SQL – The DAO Object Model. Additional Controls Available in VB 6.0 – Objectives – SSTab Control. ActiveX Data Objects – Why ADO – Establishing a Reference.

## **Unit V**

Crystal and Data Reports: Crystal Reports – Data Report – Distributing your Application: Objectives – Working with the Packaging and Deployment Wizard. ActiveX: Objectives – What is ActiveX – Why ActiveX. ActiveX and Web pages: Objectives – ActiveX and Internet. ActiveX Documents: The Application Form Document. Sample Application in VB like Inventory Control.

## **TEXT BOOK:**

“Programming with Visual Basic 6.0”, Mohammad Azam Vikas Publishing House Pvt. Ltd.

# **309UCAT04: PROGRAMMING LANGUAGE JAVA AND JAVASCRIPT**

## **Unit I**

Fundamentals of Object – Oriented Programming, JAVA Evolution, Overview of JAVA language: Introduction – JAVA program structure – simple JAVA program – JAVA tokens – JAVA statements – Implementing a JAVA program – JAVA virtual machine – Command Line Arguments.

## **Unit II**

Constants, Variables and Data types, Operators and Expressions, Decision making and branching , decision making and looping.

## **Unit III**

Class, Objects and methods, Arrays, Strings and Vectors, Inheritance, Packages: Putting Classes together, Multithreaded programming.

## **Unit IV**

Managing Errors and Exceptions, Applet programming, Graphic programming , managing I/O files in JAVA.

## **Unit V**

Introduction to JAVA SCRIPT, placing JAVA SCRIPT in an HTML file, Using variables, using functions , event handlers, objects : predefined java script objects , the document object , JAVA SCRIPT arrays, math and date object , handling strings, JAVA SCRIPT and forms.

## **TEXT BOOK:**

1. "programming with JAVA "  
E. Balagurusamy  
T.M.H, New Delhi.  
Second Edition  
(Unit I to IV)
2. " Java Script a beginners Guide "  
John Pollock  
T.M.H, New Delhi.  
(Unit V)

## **309UCAP01: Practical - PROGRAMMING IN VISUAL BASIC**

### **LIST OF PRACTICALS:**

1. Construction of an Arithmetic Calculator (Simple).
2. Preparation of Students Mark Sheet.
3. Personal Information system (Using Tables).
4. Quiz Program System (Using Tables).
5. Railways Reservation System (Using Tables).
6. Voters Information System (Using Tables).
7. Library Information System (Using Tables).

## **309UCAP02: PROGRAMMING IN JAVA AND JAVA SCRIPT**

### **JAVA SCRIPT Programming List:**

1. To Develop a Dynamic Web Page using Java Script.
2. Program to create an HTML page with Java Script.
3. Program to create an HTML page using Event Handling.
4. Develop a Java Script using document and window object.
5. Program to create a Java Script clock.
6. Program to work with Forms using Java Script.

### **JAVA Programming List :**

7. Program to create a simple Applet and application.
8. Using Java Class and Objects.
9. Using Java Inheritance and Interface.
10. Single Arrays in Java.
11. Using Threads and Multithreads
12. Using AWT package
13. Using I/O package