



**PANJAB UNIVERSITY, CHANDIGARH-160014 (INDIA)**

(Estd. under the Panjab University Act VII of 1947 — enacted by the Govt. of India)

**FACULTY OF SCIENCE**

**SYLLABI**

**FOR**

**BACHELOR OF COMPUTER APPLICATIONS**

**(1<sup>st</sup> to 6<sup>th</sup> Semester)**

**FOR**

**2017 - 2018 SESSIONS**

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# Panjab University, Chandigarh

## Scheme of Examination and Syllabus of BCA w.e.f. 2017-18

### Bachelor of Computer Applications Semester – I

Paper Code	Title	L	T		Total	Int	Ext	Total	Exam. Duration	Credits
BCA-16-101	English(Compulsory)-A	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-102	Fundamentals of Mathematical Statistics	6	1	-	7	10	65	75	3 Hrs	3
BCA-16-103	Computer Fundamentals and Computing Software	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-104	Problem Solving Through C	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-105	Lab based on BCA-16-103	-	-	6	6	-	50	50	4 Hrs	2
BCA-16-106	Lab based on BCA-16-104	-	-	6	6	-	50	50	4 Hrs	2
	Environment, Road Safety Education & Violence against Women & Children									
	<b>Total</b>	<b>24</b>	<b>1</b>	<b>12</b>	<b>37</b>	<b>40</b>	<b>360</b>	<b>400</b>		<b>16</b>

### Bachelor of Computer Applications Semester – II

Paper Code	Title	L	T	P	Total	Int	Ext	Total	Exam. Duration	Credits
BCA-16-201	English (Compulsory)-B	6	-	-	6	10	65	075	3 Hrs	3
BCA-16-202	Computer Organization	6	1	-	7	10	65	75	3 Hrs	3
BCA-16-203	Fundamentals of Web Programming	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-204	Object Oriented Programming using C++	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-205	Lab based on BCA-16-203	-	-	6	6	-	50	50	4 Hrs	2
BCA-16-206	Lab based on BCA-16-204	-	-	6	6	-	50	50	4 Hrs	2
	<b>Total</b>	<b>24</b>	<b>1</b>	<b>12</b>	<b>37</b>	<b>40</b>	<b>360</b>	<b>400</b>		<b>16</b>

### Bachelor of Computer Applications Semester – III

Paper Code	Title	L	T	P	Total	Int	Ext	Total	Exam. Duration	Credits
BCA-16-301/ BCA-16-302	Punjabi-A/ History & Culture of Punjab – A	6	-	-	6	5	45	50	3 Hrs	3
BCA-16-303	Information System Design and Implementation	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-304	Computer Oriented Numerical Methods	6	1	-	7	10	65	75	3 Hrs	3
BCA-16-305	Data Structures	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-306	Lab based on BCA-16-304	-	-	6	6	-	50	50	4 Hrs	2
BCA-16-307	Lab based on BCA-16-305	-	-	6	6	-	50	50	4 Hrs	2
	<b>Total</b>	<b>24</b>	<b>1</b>	<b>12</b>	<b>37</b>	<b>35</b>	<b>340</b>	<b>375</b>		<b>16</b>

### Bachelor of Computer Applications Semester – IV

Paper Code	Title	L	T	P	Total	Int	Ext	Total		Credits
BCA-16-401/ BCA-16-402	Punjabi-B/History & Culture of Punjab – B	6	-	-	6	5	45	50	3 Hrs	3
BCA-16-403	Software Project Management	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-404	Operating System Concepts and Linux	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-405	Database Management System	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-406	Lab based on BCA-16-404	-	-	6	6	-	50	50	4 Hrs	2
BCA-16-407	Lab based on BCA-16-405	-	-	6	6	-	50	50	4 Hrs	2
	<b>Total</b>	<b>24</b>	<b>-</b>	<b>12</b>	<b>36</b>	<b>35</b>	<b>340</b>	<b>375</b>		<b>16</b>

## Bachelor of Computer Applications - Fifth Semester

Paper Code	Paper Name	Theory & Practical Lectures	Univ. Exam. Marks	Int. Exam. Marks	Exam. Hours	Paper Code
18.	Entrepreneurship Development Programme	4	90	10	3	BCA-501
19.	Principles of Computer Graphics & Multimedia Technology	5	90	10	3	BCA-502
20.	Discrete Mathematics in Computer Science	5	90	10	3	BCA-503
21.	Computer Lab.: Based on BCA-502	5	90	10	4	BCA-504

## Bachelor of Computer Applications - Sixth Semester

22.	Web Programming	5	90	10	3	BCA-601
23.	Computer Organization	5	90	10	3	BCA-602
24	Computer Networks	5	90	10	3	BCA-603
24.	Minor Project and Seminar Based on BCA-601	5	90	10	4	BCA-604

**\*The Environment, Road Safety Education & Violence against Women & Children is a compulsory qualifying paper which the students have to study in the B.C.A. 1<sup>st</sup> year (2<sup>nd</sup> Semester). If the students failed in qualify the paper during 2<sup>nd</sup> Semester, he / she / they be allowed to appear / qualify the same in the 4<sup>th</sup> or 6<sup>th</sup> semester/s.**

# **FIRST SEMESTER**

**FIRST SEMESTER**  
**English (Compulsory) – A**  
**BCA-16-101**

**L      T      P      Cr**  
**6      -      -      3**

**External Marks : 65**  
**Internal Marks : 10**

**Time Duration : 3Hrs.**

**Number of Lectures : 60**

**Semester I**

Book Prescribed: **Colours of Expression** by Harbhajan Singh published by Publication Bureau, Panjab University, Chandigarh

**Section A**

**1) Short Stories ( 1& 2)**

One essay type question on summary/Character/Incident (one out of two with internal choice)

**10 marks**

**II) Prose ( 1 to 3)**

Long essay type question on Summary/Theme(one out of two with internal choice)

**10 marks**

**III) Poetry (1 to 6)**

**15 marks**

Summary (one out of two with internal choice)

**5 marks**

Short Questions (two out of three)

**5 marks**

Reference to the Context (one out of two with internal choice)

**5 marks**

**Section B**

1) Word formation from Prose and Stories and their use in sentences (5 out of 8)

**10 marks**

2) Use of textual words and idioms in sentences (5 out of 8)

**10 marks**

3) Translation from Hindi/Punjabi to English

**5 marks**

(a small Paragraph)

OR

For Foreign Students (Paraphrase of Poetry Passage)

4) Official, Business and Letters to the Editors

**5 marks**

**Fundamentals of Mathematical Statistics**  
**: BCA-16-102**

**L     T     P     Cr**  
**6     1     -     3**

**External Marks: 65**  
**Internal Marks: 10**

**Time Duration: 3 Hrs.**

Number of Lectures : 60

**Objective:** To teach the students the basic techniques Statistical Methods. After completing this course students will be able to solve various Financial, Scientific and Engineering fields' problems.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.
- v. **The student can use only Non-programmable & Non-storage type of Calculator.**
- vi. **Log tables are allowed. Students may be provided the same for computation.**

**UNIT - I**

**Basic Statistics:** Types of Statistics, Different Statistical Techniques, Steps in Statistical Investigation, Uses and Limitations of statistics, Collection of Data: Sources of collecting primary and Secondary Data, Limitations of Secondary Data, Criteria of evaluating secondary data, Organization of data, Graphs of Grouped Frequency Distribution, Tabulation of Data, Parts of Table  
**Measures of Central Tendency:** Kinds of measures of central tendency (statistical averages or averages):

**Arithmetic Mean:** Simple Arithmetic Mean, Methods of calculating Simple Arithmetic Mean, Arithmetic Mean in case of Individual Series, Discrete series and continuous series, Weighted Arithmetic Mean, Combined Arithmetic Mean.

**Geometric Mean:** Simple Geometric Mean , Methods of calculating Simple Geometric Mean, Geometric Mean in case of Individual Series, Discrete series and continuous series, Weighted Geometric Mean, Combined Geometric Mean.

**Harmonic Mean:** Simple Harmonic Mean ,Methods of calculating Simple Harmonic Mean, Harmonic Mean in case of Individual, Discrete series and continuous series, Weighted Harmonic Mean, Combined Harmonic Mean.

**UNIT - II**

**Median:** Methods of Calculating Median in case of Individual, Discrete series and continuous series

**Partition Value:** Quartile, Quintiles, Hexiles, Septiles, Octiles, Deciles, Percentiles

**Mode:** Methods of Calculating Mode in case of Individual Series, Discrete series and continuous series

**Range:** Computation of Range, Inter Quartile Range, Computation of Inter Quartile Range, Percentile Range and Computation of Percentile Range.

Mean Deviation, Computation of Mean Deviation, Standard Deviation, Calculation of Standard Deviation, Variance, Calculation of Standard Deviation for individual Series, Discrete Series and Continuous Series, Coefficient of Standard Deviation and coefficient of variation, Combined Standard Deviation, Correcting incorrect Standard Deviation

### UNIT - III

**Correlation Analysis :** Correlation Analysis: Definition, Types of Correlation: Positive, Negative, Simple, Multiple, Partial, Total, Linear and Non-Linear. Need of Correlation Analysis, Correlation and Causation, Techniques for Measuring Correlation: Scatter Diagram Method, Graphic Method, Karl Pearson's Coefficient of Correlation: Correcting incorrect coefficient of correlation, calculating Karl Pearson's coefficient of correlation in case of grouped series, Probable Error, Coefficient of Determination, Spearman's coefficient of Correlation (Rank correlation): Calculation of Correct Coefficient of rank correlation, Difference between Rank Coefficient and Karl Pearson's coefficient of coefficient, Coefficient of concurrent deviation.

### UNIT - IV

**Regression Analysis (Linear Regression):** Definition, Difference between Correlation and Regression, Types of Regression Analysis: Simple, Multiple, Partial, Total, Linear and Non-Linear, Objectives of Regression Analysis, Methods of obtaining regression analysis: Regression Lines, Regression Equations. Methods of obtaining regression equations: Normal Equations and Regression Coefficient, Properties of Regression Coefficient, Standard Error of Estimate, Regression Coefficient in case of Grouped Data, Uses of Regression Analysis and Limitations of Regression Analysis.

#### **Suggested Readings:**

1. Gupta S.C, Kapoor V.K. : Fundamentals of mathematical Statistics, Sultan Chand & Sons.
2. Gupta, S.P., 2003 : Statistical Methods, S. Chand.
3. Affi, A.A, 1979 : Statistical Analysis: A Computer Oriented Approach, Academic Press, Inc.



# Computer Fundamentals and Computing Software

BCA-16-103

L T P Cr  
6 - - 3

External Marks: 65  
Internal Marks: 10

Time Duration: 3 Hrs.

Number of Lectures : 60

**Objectives:** The objective of this course is to familiarize students with complete Fundamentals and the carriers commonly used computing software.

## Note :

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.

## UNIT - I

**Computer Appreciation:** Introduction to computers, characteristics of computer; History of computers; Classification of computers on size: (Micro, Mini, Mainframe and super computers), Working Principles, Generations; Applications of computers; commonly used terms–Hardware, Software, Firmware. Basic Computer Organization: Block diagram of computer system, Input unit, Processing Unit and Output Unit; Description of Computer input devices: Keyboard, Mouse, Trackball, Pen, Touch screens, Scanner, Digital Camera; Output devices: Monitors, Printers, Plotters.

**Computer Memory:** Representation of information: BIT, BYTE, Memory, Memory size; Units of measurement of storage; Main memory: Storage evaluation criteria, main memory organization, RAM, ROM, PROM, EPROM; Secondary storage devices: Sequential Access Memory, Direct Access Memory Magnetic Tapes, Magnetic disks, Optical disks: CD, DVD; Memory storage devices: Flash Drive, Memory card;

**Types of software:** System and Application software; Programming Languages: Generation of Languages; Translators - Interpreters, Compilers, Assemblers and their comparison.

## UNIT - II

**Understanding Operating System using DOS :** Introduction to operating systems and its functions, DOS and versions of DOS, Booting sequence; Warm and Cold Boot; Concepts of files and directories, Redirecting command input and output using pipes, Wildcard characters, Types of DOS commands: Internal and External; Internal Commands: DIR, MD, CD, CLS, COPY, DATE, DEL, PATH, PROMPT, REN, RD, TIME, TYPE, VER, VOL; External Commands: XCOPY, ATTRIB, BACKUP, RESTORE, FIND, SYS, FORMAT, CHKDSK, DISKCOPY, LABEL, MOVE, TREE, DELTREE, DEFRAG, SCANDISK, UNDELETE. Batch Files: Introduction to simple batch files; Introduction to CONFIG.SYS and AUTOEXEC.BAT files.

**Understanding Graphical User Interface using Windows:** Fundamentals of Windows, Types of Windows, Anatomy of windows, Icons, Recycle bin, Operations on Folders, Registry of Windows: Basics, Editing; Control panel.

### UNIT - III

**Word Processing Package:** Opening, saving and closing an existing document; renaming and deleting files; Using styles and templates: Introduction to templates and styles; applying, modifying and creating new (custom) styles; using a template to create a document, creating a template, editing a template, organizing templates, examples of style use, Changing document views, Moving quickly through a document, Working with text: select, cut, copy, paste, find and replace, inserting special characters, setting tab stops and indents, Checking spelling and Grammar, Autocorrect, Using built-in language tools, word completion, Autotext, Formatting text: Using Styles, formatting paragraphs, formatting characters, auto-formatting, creating lists; Formatting pages: Using layout methods, creating headers and footers, Numbering pages, Changing page margins, Adding comments to a document, Creating a table of contents, Creating indexes and bibliographies, Printing a document, Using mail merge, Tracking changes to a document, Using fields, Linking to another part of a document, Using master documents, Creating fill-in forms.

### UNIT - IV

**Spreadsheet Package:** Introduction to Spreadsheets, sheets and cells; Opening and saving spreadsheet files; Working with sheets: inserting new sheet, deleting and renaming sheets, Viewing a spreadsheet: freezing rows and columns, splitting screen, Entering data: cell referencing, formatting cells, entering numbers, entering numbers as text, entering formulae, entering date and time, deactivating automatic changes, Speeding up data entry: using fill tool, fill series, defining fill series, Validating cell contents, Formatting data: formatting text, numbers, cells, Autoformatting cells and sheets, defining new autoformat, Using conditional formatting, Hiding and showing data, Sorting records, Printing a spreadsheet document: using print ranges, page formats, inserting page breaks, headers and footers; Working with Graphs and Charts : Creating Embedded Chart, formatting chart: Changing chart types, adding Titles, Legends and Gridlines, Printing Charts; Adding database functions: defining database ranges, sorting, filtering and grouping database ranges; Evaluating data: using DataPilot; Functions and Macros: using and editing existing macro, Creating Macros, Recording Macros, Running Macros.

**Presentation Packages:** Basics of creating a presentation, Parts of main window, workspace views, creating a presentation, Incorporation of Animation.

**Note:** Any word processing, spreadsheet and presentation package may be used. Focus should be on open source software's.

#### Suggested Readings:

1. Basandra, S.K. : Computers Today, Galgotia.
2. Sinha P.K. & Sinha Priti : Computer Fundamentals, BPB Publications
3. Mathur Rajiv, 1995: DOS 6.2 Quick Reference, Galgotia.
4. OOoAuthors Team : Getting Started with OpenOffice.org 3.3, Friends of OpenDocument
5. Singleton, Roderick G.: OpenOffice.org User Guide.

## Problem Solving Through C BCA-16-104

<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
<b>6</b>	<b>-</b>	<b>-</b>	<b>3</b>

**External Marks: 65**  
**Internal Marks: 10**

**Time Duration: 3 Hrs.**

Number of Lectures : 60

**Objective:** The objective of this course is to make the student understand programming language concepts, mainly control structures, reading a set of data, stepwise refinement, function and arrays. After completion of this course, the student is expected to analyze the real life problem and write programs in 'C' language to solve problems. The main emphasis of the course is on problem solving aspect.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.

### UNIT - I

**Programming Process:** Steps in developing of a program, Data Flow Diagram, Decision Table, Algorithm development, Flowchart, Pseudo Code, Testing and Debugging.

**Fundamentals of C Languages:** History of C, Character Set, Identifiers and Keywords, Constants, Types of C Constants, Rules for Constructing Integer, Real and character Constants, Variables, Data Types, rules for constructing variables.

**Operators and Expressions:** C Instructions, Arithmetic operators, Relational operators, Logical operators, Assignment Operators, Type Conversion in Assignments, Hierarchy of Operations, Standard and Formatted Statements, Structure of a C program , Compilation and Execution.

### UNIT - II

**Decision Control Structure:** Decision making with IF-statement, IF-Else and Nested IF-Else, The else if Clause.

**Loop Control Structure:** While and do-while, for loop and Nested for loop,

**Case Control Structure:** Decision using switch, Thegoto statement.

**Functions:** Library functions and user defined functions, Global and Local variables, Function Declaration, Calling and definition of function, Methods of parameter passing to functions, recursion, Storage Classes in C.

### UNIT - III

**Arrays:** Introduction, Array declaration, Accessing values in an array, Initializing values in an array, Single and Two Dimensional Arrays, Initializing a 2-Dimensional Array, Memory Map of a 2-Dimensional Array, Passing array elements to a function: Call by value and call by reference, Arrays of characters, Insertion and deletion operations, Searching the elements in an array, Using matrices in arrays, Passing an Entire Array to a Function.

**Pointers:** Pointer declaration, Address operator “&”, Indirection operator “\*”, Pointer and arrays, Pointers and 2-Dimensional Arrays, Pointer to an Array, Passing 2-D array to a Function, Array of Pointers.

**Dynamic Memory Allocation:** malloc(), calloc(), realloc(), free() functions.

## UNIT - IV

**String Manipulation in C:** Declaring and Initializing string variables, Reading and writing strings, String Handling functions (strlen(), strcpy(), strcmp(), strcat()).

**Structures and Unions:** Declaration of structures, Structure Initialization, Accessing structure members, Arrays of structure, Nested structures, Structure with pointers, Union.

**Files in C:** Introduction, Opening and Closing files, Basic I/O operation on files.

### Suggested Readings:

#### Essential :

1. Yashavant P. Kanetkar : Let us C, BPB Publications, New Delhi.

#### Further Reading:

2. Salaria, R.S. : Test Your Skills in C, Salaria Publications, New Delhi.
3. C. Balaguruswami : Programming with C Language, Tata McGraw Hill, New Delhi.
4. Byron S. Gottfried : Programming in C, McGraw Hills Publishers, New York.
5. M.T. Somashekara : Programming in C, Prentice Hall of India.

# **SECOND SEMESTER**

**English (Compulsory) – B**

**BCA-16-201**

**L T P Cr**  
**6 - - 3**

**External Marks : 65**  
**Internal Marks : 10**

**Time Duration : 3Hrs.**

**Number of Lectures : 60**

**Semester II**

Book Prescribed: **Colour of Expression** by Harbhajan Singh published by Publication Bureau, Panjab University, Chandigarh

**Section A**

**1) Short Stories ( 3-5)**

One essay type question on summary/Character/Incident (one out of two with internal choice) **10 marks**

**2) Prose ( 4-5)**

Long essay type question on Summary/Theme (one out of two with internal choice) **10 marks**

**3) Poetry (7-11)**

**15marks**

Summary (one out of two with internal choice)

**5 marks**

Short Questions (two out of three)

**5 marks**

Reference to the Context(one out of two with internal choice)

**5 marks**

**Section B**

1) Paragraph Writing(Descriptive and Narrative)

**10 marks**

2). Use of textual words and idioms in sentences (5 out of 8)

**10 marks**

3). Translation from Hindi/Punjabi to English  
(isolated sentences)

**5 marks**

**OR**

For Foreign Students (Paraphrase of Poetry Passage)

4) Transformation of all types (5 out of 5)

**5 marks**

## Computer Organization BCA-16-202

L     T     P     Cr  
6     -     -     3

External Marks: 65  
Internal Marks: 10

**Time Duration: 3 Hrs.**

Number of Lectures : 60

**Objectives:** This course will enable the student to understand the basic organization of computer system and system maintenance.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.

### UNIT - I

**Computer Organisation:** Evolution of Computers, Von Neumann Architecture, Combinatorial Blocks : Gates, Half Adder, Full Adder, Multiplexers, Decoders, Encoders; Sequential Building blocks : Flip Flops, Registers, Counters, Information representation: codes, fixed and floating point representation  
Arithmetic: Addition and subtraction for sign magnitude and 2's complement numbers, integer multiplication using Booth's algorithms

### UNIT - II

**Architecture of a Simple Processor:** Architecture of 8086/8088 microprocessor, instruction set, Addressing Modes.  
Instruction: Microinstructions: Register Transfer, Arithmetic, Logical and Shift, Types of Instructions, Instruction Cycle.  
Interrupt: Types, Interrupt Cycle  
I/O organization: Strobe based and Handshake based communication, DMA based data transfer;

### UNIT - III

**Memory Organisation:** Memory Hierarchy, RAM (Static and Dynamic), ROM Associative memory, Cache memory organisation, Virtual memory organisation.  
Assembly Language : Features of Assembly Language, Machine Language vs Assembly Language, Pseudo Instruction; use of Assembly for programs: Addition, Subtraction, Multiplication using Subroutines and Basic Input/ Output.

### UNIT – IV

**System Maintenance:** Introduction to various physical components of a computer, Physical Inspection and Diagnostics on PC, Functional description of various Internal and External cards; Viruses: Types of Computer Viruses, Detection, prevention and protection from Viruses.

## **Suggested Readings:**

### **Essential :**

1. M. Morris Mano, 1993. : Computer System Architecture, Prentice Hall International, 3rd Ed.,

### **Further Reading :**

2. P. Pal Choudhri, 1994. : Computer Organisation and Design, Prentice Hall of India.
3. Biswal, Sadasiva, 2001 : Basic Electronics, Pub-Atlantic, New Delhi.
4. B. Govindarajalu, 1994. : IBM-PC and Clones - Hardware Troubleshooting and Maintenance, Tata-McGraw-Hill.



# Fundamentals of Web Programming

BCA-16-203

L T P Cr  
6 - - 3

External Marks: 65  
Internal Marks: 10

Time Duration: 3 Hrs.

Number of Lectures : 60

**Objectives:** This course will enable the student to build and publish web sites using HTML, DHTML, CSS, JavaScript and Dreamweaver.

## Note :

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.

## UNIT - I

**Basic Terminology:** Web Server; Web Client/Browser, Understanding how a Browser communicates with a Web Server, Website, Webpage, Static Website, Dynamic Website, Internet, Intranet, Extranet, WWW, URL

**HTML:** Structure of an HTML program, Paragraph Breaks, Line Breaks; Emphasizing Material in a Web Page (Heading Styles, Drawing Lines); Text Styles (Bold, Italics, Underline); Other Text Effects (Centering (Text, Images etc.)

Lists: Unordered List, Ordered Lists, Definition lists

Adding Graphics to HTML Documents using the Border, Width, Height, Align, ALT Attributes

Tables: Caption Tag, Width, Border, Cell padding, Cell spacing, BGCOLOR, COLSPAN and ROWSPAN Attributes.

## UNIT - II

**Linking Documents:** Anchor tag, External Document References, Internal Document References and Image Maps

**Frames:** Introduction to Frames: The <FRAMESET> tag, The <FRAME> tag, Targeting Named Frames

**DHTML:** Introduction to cascading style sheets (CSS), Style tag, Link tag, Types of CSS: In-Line, Internal, External

**Forms:** Attributes of Form element, Input element, The Text Element, Password, Button, Submit Button, Reset Button, The Checkbox, Radio, TextArea, Select and Option

## UNIT - III

**Java Script:** Introduction and Features of JavaScript, Writing JavaScript into HTML, tokens, data types, variables, operations, control constructs, strings arrays, functions, core language objects, client side objects, event handling. Applications related to client side form validation.

Other Built-In Objects in JavaScript: The String Object, The Math Object, The Date Object;

:

## UNIT - IV

**Introduction to Dreamweaver:** Understanding Workspace Layout, Managing Websites, Creating a Website, Using Dreamweaver Templates, Adding New WebPages, Text and Page Format, Inserting Tables, Lists, Images, Adding Links.

Web Hosting: Understanding Domain Name & Web Space, Getting a Domain Name & Web Space (Purchase or Free), Uploading the Website to Remote Server, Introduction to Open Source Third party FTP Tools

### Suggested Readings:

#### Essential :

- |   |                   |   |   |
|---|-------------------|---|---|
| 1 | Wanger & Wyke     | : | Java Script Unleased, Pearson Education, New Delhi. |
| 2 | Bayross, Ivan     | : | HTML, DHTML, Java Script by BPB, Latest reprint     |
| 3 | Schildt , Herbert | : | The Complete Reference Java 2, TMH, Latest reprint  |
| 4 | Joseph Lowery     | : | Adobe Dreamweaver CS5 Bible Paperback Edition       |

#### Further Reading :

- |   |                  |   |   |
|---|------------------|---|---|
| 5 | Thomas Powell    | : | HTML & CSS: The Complete Reference            |
| 6 | John Pollock     | : | JavaScript, A Beginner's Guide                |
| 7 | Janine C. Warner | : | Dreamweaver CS5 For Dummies Paperback Edition |
| 8 | David Powers     | : | The Essential Guide to Dreamweaver CS4        |

**Object Oriented Programming using C++**  
**: BCA-16-204**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
<b>6</b>	<b>-</b>	<b>-</b>	<b>3</b>

**External Marks: 65**  
**Internal Marks: 10**

**Time Duration: 3 Hrs.**

Number of Lectures : 60

**Objectives:** By the end of the course, students will be able to write C++ programs using the more esoteric language features, utilize Object Oriented techniques to design C++ programs, use the standard C++ library, and exploit advanced C++ techniques.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.

**UNIT - I**

**Principles of Object Oriented Programming (OOP):** Introduction to OOP, Difference between OOP and Procedure Oriented Programming; Concepts: Object, Class, Encapsulation, Abstraction, Polymorphism and Inheritance, Applications of OOP. Special operators: scope resolution operator, Member Dereferencing operators, Memory management operators, Manipulators and Type cast operator

**Structure of a C++ Program and Classes and Objects :** Class Declaration : Data Members, Member Functions, Private and Public members, Creating Objects, Accessing class data members, Accessing member functions; Class Function Definition: Member Function definition inside the class declaration and outside the class declaration.

**UNIT - II**

Friend function, inline function, Static members, Function Overloading, Arrays within a class. Arrays of Objects; Objects as function arguments: Pass by value, Pass by reference, Pointers to Objects.

**Constructors:** Declaration and Definition, Types of Constructors, (Default, Parameterized, Copy Constructors). Destructors: Definition and use.

**Operator Overloading & Type Conversion:** Conversion from basic type to user defined type, User defined to basic type and one user defined conversion to another user defined type.

## UNIT - III

**Inheritance:** Extending Classes Concept of inheritance, Base class, Defining derived classes, Visibility modes : Public, Private, Protected ;Types of Inheritance: Single inheritance : Privately derived, Publicly derived; Making a protected member inheritable, multilevel inheritance, multiple Inheritance and ambiguity of multiple inheritance, Hierarchal Inheritance, Hybrid, Nesting of classes.

**Polymorphism:** Definition, Application and demonstration of Data Abstraction, Encapsulation and Polymorphism. Early Binding, Polymorphism with pointers, Virtual Functions, Late binding, pure virtual functions.

## UNIT - IV

**Exception Handling:** Definition, Exception Handling Mechanism : Throwing mechanism and Catching Mechanism, Rethrowing an Exception

**File Processing :** Opening and closing of file, Binary file operations, structures and file operations, classes and file operations, Random file processing.

### **Suggested Readings :**

#### **Essential :**

1. E. Balaguruswamy, 2008 : Object Oriented Programming with C++, TMH.

#### **Further Reading :**

2. Bjarne Stroustrup, 2009 : The C++ Programming Language, Addison-Wesley Publishing Company.
3. Robert Lafore, 2003 : Object Oriented Programming in Turbo C++, Galgotia Pub.
4. Salaria, R. S. : Object Oriented Programming Using C++, Khanna Book Publishing Co. (P.) Ltd., New Delhi.

## **ENVIRONMENT, ROAD SAFETY EDUCATION AND VIOLENCE AGAINST WOMEN AND CHILDREN (SEMESTER – II)**

*Note: The syllabus has 15 topics to be covered in 25 hour lectures in total, with 2 lectures in each topic from 2 to 11 and one each for the topics 1 and 12 to 15.*

### **1. Environment Concept:**

Introduction, concept of biosphere – lithosphere, hydrosphere, atmosphere; Natural resources – their need and types; Principles and scope of Ecology; concepts of ecosystem, population, community, biotic interactions, biomes, ecological succession.

### **2. Atmosphere:**

Parts of atmosphere, components of air; pollution, pollutants, their sources, permissible limits, risks and possible control measures.

### **3. Hydrosphere:**

Types of aquatic systems; Major sources (including ground water) and uses of water, problems of the hydrosphere, fresh water shortage; pollution and pollutants of water, permissible limits, risks and possible control measures.

### **4. Lithosphere:**

Earth crust, soil – a life support system, its texture, types, components, pollution and pollutants, reasons of soil erosion and possible control measures.

### **5. Forests:**

Concept of forests and plantations, types of vegetation and forests, factors governing vegetation, role of trees and forests in environment, various forestry programmes of the Govt. of India, Urban Forests, Chipko Andolan.

### **6. Conservation of Environment:**

The concepts of conservation and sustainable development, why to conserve, aims and objectives of conservation, policies of conservation; conservation of life support systems – soil, water, air, wildlife, forests.

### **7. Management of Solid Waste:**

Merits and demerits of different ways of solid waste management– open dumping, landfill, incineration, resource reduction, recycling and reuse, vermicomposting and vermiculture, organic farming.

### **8. Indoor Environment:**

Pollutants and contaminants of the in-house environment; problems of the environment linked to urban and rural lifestyles; possible adulterants of the food; uses and harms of plastics and polythene; hazardous chemicals, solvents and cosmetics.

### **9. Global Environmental Issues:**

Global concern, creation of UNEP; Conventions on climate change, Convention on biodiversity; Stratospheric ozone depletion, dangers associated and possible solutions.

### **10. Indian Laws on Environment:**

Indian laws pertaining to Environmental protection: Environment (Protection) Act, 1986; General information about laws relating to control of air, water and noise pollution. What to do to seek redressal.

### **11. Biodiversity:**

What is biodiversity, levels and types of biodiversity, importance of biodiversity, causes of its loss, how to check its loss; Hotspot zones of the world and India, Biodiversity Act, 2002.

### **12. Noise and Microbial Pollution:**

Pollution due to noise and microbes and their effects.

### **13. Human Population and Environment:**

Population growth and family welfare programme, Human Health. HIV-AIDS. Human Rights.

### **14. Social Issues:**

Environmental Ethics: Issues and possible solutions, problems related to lifestyle, sustainable development; Consumerisms and waste generation.

### **15. Local Environmental Issues:**

Environmental problems in rural and urban areas. Problem of Congress Grass & other weeds, problems arising from the use of pesticides and weedicides, smoking etc.

### **Practical**

Depending on the available facility in the college, a visit to vermi composting units or any other such non-polluting eco-friendly site or planting/caring of vegetation/trees could be taken.

### **Examination Pattern:**

**A qualifying paper of 50 marks comprising of fifty multiple choice questions (with one correct and three incorrect alternatives and no deduction for wrong answer or un-attempted question), and of 1 hour duration.**

**The students have to obtain 33% marks to qualify the paper. The marks are not added / included in the final mark sheet.**

## **UNIT II (ROAD SAFETY)**

1. Concept and Significance of Road Safety.
2. Role of Traffic Police in Road Safety.
3. Traffic Engineering – Concept & Significance.
4. Traffic Rules & Traffic Signs.
5. How to obtain Driving License.
6. Traffic Offences, Penalties and Procedures.

7. Common Driving mistakes.
8. Significance of First-aid in Road Safety.
9. Role of Civil Society in Road Safety.
10. Traffic Police-Public Relationship.

**Note : Examination Pattern :**

- The Environment and Road Safety paper is 70 marks.
- Seventy multiple choice questions (with one correct and three incorrect alternatives and no deduction for wrong or un-attempted questions).
- The paper shall have two units: **Unit I (Environment) and Unit II (Road Safety)**.
- Unit II shall comprise of 20 questions with minimum of 1 question from each topics 1 to 10.
- The entire syllabus of Unit II is to be covered in 10 hours.
- All the questions are to be attempted.
- Qualifying Marks 33 per cent i.e. 23 marks out of 70.
- Duration of examination: 90 minutes.
- The paper setter is requested to set the questions strictly according to the syllabus.

**Suggested Readings**

1. The Motor Vehicle Act, 1988 (2010), Universal Law Publishing Co. Pvt. Ltd., New Delhi.
2. Road Safety Signage and Signs (2011), Ministry of Road Transport and Highways, Government of India.

**Websites:**

- (a) [www.chandigarhpolice.nic.in](http://www.chandigarhpolice.nic.in)
- (b) [www.punjabpolice.gov.in](http://www.punjabpolice.gov.in)
- (c) [www.haryanapolice.gov.in](http://www.haryanapolice.gov.in)
- (d) [www.hppolice.nic.in](http://www.hppolice.nic.in)

**SYLLABUS ON “VIOLENCE AGAINST WOMEN & CHILDREN” AT UNDER-GRADUATE LEVEL**

**UNIT III OF COMPULSORY PAPER ON ENVIRONMENT & ROAD SAFETY EDUCATION**

**AS PART OF SEMESTER - II**

**Unit – III**

**VIOLENCE AGAINST WOMEN & CHILDREN**

**1. Concept and Types of Violence:** Meaning and Definition of violence; Types of Violence against women – domestic violence, sexual violence (including rape), sexual harassment, emotional/psychological violence; Types of Violence against children – physical violence, sexual violence, verbal and emotional abuse, neglect & abandonment.

**2. Protective Provisions of IPC on Domestic Violence & Sexual Violence against Women:**

**Dowry Death** – Section 304B;

**Rape** – Sections 375, 376(1), 376A, 376B, 376C, 376D and 376E;

**Cruelty** – Section 498A;

**Insult to Modesty** – The Indian Penal Code does not define the word eve-teasing; there are three sections which deal with crime of eve-teasing. These are Sections, 294, 354 and 509 of Indian Penal Code. Section 509 of the Indian penal code defines (Word, gesture or act intended to insult the modesty of a woman), Section 294 – (Obscene acts and songs) and Section 354 (Assault or criminal force to woman with intent to outrage her modesty);

**Hurt & Grievous Hurt Provisions** – Sections 319 to 326;

**Acid Attacks** – Sections 326A and 326B;

**Female Infanticide** – Section 312, Section 313 of Indian Penal Code (Causing miscarriage without women’s consent) and section 314;

**Sexual Harassment** – For providing protection to working women against sexual harassment, a new section 354 A is added; 354 B (Assault or use of criminal force to women with intent to disrobe); 354 C Voyeurism; 354 D (Stalking). All these provisions are added in IPC to protect women against acts of violence through Criminal Law (Amendment) Act, 2013; Human Trafficking and Forced Prostitution- Sections 370 and 370A

**3. Protective Laws for Women:**

**3.1 Provisions of Protection of Women Against Domestic Violence Act 2005** – Definition, Powers of the Magistrate and Protection Officers, Protection order, Residence order, Monetary relief, Custody order and Compensatory order.

**3.2 The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013** – Definition, Internal Complaint Committee, Local Complaint Committee, Procedure adopted by Committee for punishing accused.

**4. Protective Provisions of IPC regarding Sexual Violence against Children:**

**Section 293**(sale etc. of obscene objects to young persons); 294 (obscene acts & songs); 305 (abetment of suicide of child); 315 to 317 (act causing death after birth of a child etc.); 361



(kidnapping from lawful guardianship); 362 (abduction); 363 (punishment for kidnapping); 363A (kidnapping or maiming a minor for purposing of begging); 364A (kidnapping for ransom etc.); 366 (kidnapping etc. to compel woman for marriage etc.); 366A (procuration of minor girl for illicit forced intercourse); 366B (importation of girl from foreign country); 367 (kidnapping/abduction in order to subject person to grievous hurt, slavery etc.); 369 (kidnapping adductive child under 10 year with intent to steal from its person); 372 & 373 (selling & buying minor for purposes of prostitution etc.).

**4.1 The Protection of Children from Sexual Offences Act, 2012:** An overview of the POCSO, relevant legal provisions and guidelines for the protection of children against sexual offences along with punishments; role of doctors, psychologists & mental experts as per rules of POCSO.

**Note: Instructions for Examination:**

- Unit III of the paper dealing with Violence against Women and Children is of 30 Marks.
- It shall have 30 multiple-choice questions (with one correct and three incorrect choice options and no deduction of marks for wrong or un-attempted questions).
- Minimum two questions from each topic must be covered.
- All the questions are to be attempted
- Qualifying Marks 33 percent
- Duration of Examination 30 Minutes
- The Paper Setter is requested to set the questions strictly according to the syllabus.

**Pedagogy:**

- The entire syllabus of Unit III is to be covered in ten hours in total, with each lecture of one-hour duration.
- The purpose behind imparting teaching-learning instructions is to create basic understanding of the contents of the Unit III among the students.

**RELEVANT READING MATERIAL**

Ahuja, Ram (1998), *Violence against Women*, New Delhi: Rawat Publication  
NRHM, *Child Abuse*, A Guidebook for the Media on Sexual Violence against Children  
The Indian Penal Code (Universal Law Publishing Co. Pvt. New Delhi).  
The Protection of Children from Sexual Offences Act, 2012  
The Protection of Women from Domestic Violence Act 2005  
The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013  
UNO, *United Nations Secretary-General's Study on Violence against Children*, adapted for Children and Young People

## Unit IV (Drug Abuse)

### Drug Abuse: Problem, Prevention and Management

**Note :** This is a compulsory qualifying paper, which the students have to study and qualify during three year of degree course.

#### Main Objective

This module introduces to the students the problem of drug abuse and its adverse consequences for the society. The students would get an understanding of why drug abuse is such a serious problem to our society. The course also apprises them of how to prevent and manage this menace.

#### Learning objectives of the course

1. Understand the meaning of the term drug.
2. Understand the difference between use, misuse and abuse of drugs.
3. Differentiate between commonly abused legal and illegal drugs.
4. Become aware of common signs and symptoms of drug abuse.
5. Understand the causes and consequences of drug abuse
6. Identify and access safety measures for support to stay away/give up drug abuse
7. Become aware of the interventions for the prevention and management of drug abuse.

#### Pedagogy of the course work

1. 70 % Lectures (Including expert lectures)
  2. 30% assignments, discussion, seminars and class tests.
- A visit to drug de-addiction centre could also be undertaken

#### Course content

##### UNIT I: Problem of Drug Abuse

**a) Concept and overview :** what are drugs and what constitutes drug abuse? Historical perspective of drug abuse. How drug abuse is different from drug dependence and drug addiction? Physical and psychological dependence: concepts of drug tolerance and withdrawal symptoms.

##### b) Types of drugs often abused and their effects

**Stimulants:** tobacco Amphetamines: dl-amphetamine (Benzedrine ®), dextroamphetamine (Dexedrine®). Cocaine.

**Depressants :** Alcohol. Barbiturates: phenobarbitone (Nembutal®), secobarbital (Seconal®), Benzodiazepenes: diazepam (valium ®), alprazolam (Xanax®), flunitrazepam (Rohypnol®)

**Narcotics:** Morphine, heroin ('Chitta'/ 'Brown Sugar'), pethidine, oxycodone.

**Hallucinogens:** cannabis ['Bhang', marijuana ('Ganja'), hashish ('Charas'), hash oil]. MDMA (3, 4- methylenedioxy methamphetamine) /'Ecstasy'/ 'Molly'. LSD (lysergic acid diethylamide).

**Miscellaneous:** cough/cold medicines: diphenhydramine (Benadryl®), chlorpheniramine maleate+ codeine+alcohol (Corex®). Iodex®, Vicks®, Amrutanjan® and correction fluid (Whitener).

## **UNIT II: Theories of consequences of drug abuse**

a) **Theories of drug abuse:** Physiological theory. Psychological theory. Sociological theory.

b) **Consequences of drug abuse:** For individuals, families, society and economy.

## **Unit III: Extent and nature of the problem**

Magnitude of the menace of drug abuse. Vulnerable age groups. Characteristic and features of proneness. Signs and symptoms of drug abuse.

Physical indicators. Academic indicators. Behavioural and psychological indicators.

## **UNIT IV: Prevention and management of drug abuse**

Legislations, public policies and programs for the prevention and cure of drug abuse. Prevention of drug abuse. Management of drug abuse. Medical management. Working of drug De-addiction Centres. Role of Family, School and media.

### **Suggested readings:**

1. Clayton, J.M and Scott, M.A (2014). Drugs and Drugs Policy: the control of consciousness alteration. New Delhi: Sage Publications India Pvt. Ltd.
2. Kapoor, T. (1985). Drug epidemic among Indian Youth, New Delhi: Mittal Pub
3. Modi, I and Modi S.(1997). Drugs: Addiction and prevention, Jaipur: Rawat Publication.
4. Ahuja, R (2003). Social problems in India, Rawat Publication, Jaipur
5. 2003 National Household survey of Alcohol and Drug Abuse. New Delhi, Clinical Epidemiological Unit, AIIMS, 2004
6. World Drug Report, (updated every year), United Nations office of Drug and Crime.
7. Extent, pattern and Trend of Drug use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
8. The Narcotic Drugs and Psychotropic substances Act, 1985. (New Delhi: Universal, 2012).
9. Government of India (2015).Scheme of assistance for prevention and alcoholism and substance (Drugs) abuse and for social defence services-Guidelines. Ministry of social Justice and Empowerment. New Delhi.

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# **THIRD SEMESTER**

**ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ**  
ਦਸੰਬਰ 2017 ਦੇ ਇਮਤਿਹਾਨ ਲਈ

ਕੁੱਲ ਅੰਕ : 50  
ਬਿਊਰੀ : 45  
ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ: 05  
ਸਮਾਂ: 3 ਘੰਟੇ

**ਸਿਲੇਬਸ**

1. ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵੀਆਂ ਦੀਆਂ ਚੋਣਵੀਆਂ ਕਵਿਤਾਵਾਂ ਦਾ ਅਧਿਐਨ
2. ਚੋਣਵੀਆਂ ਪੰਜਾਬੀ ਕਹਾਣੀਆਂ ਦਾ ਅਧਿਐਨ
3. ਚੋਣਵੇਂ ਪੰਜਾਬੀ ਲੇਖਕਾਂ ਦਾ ਸੰਖੇਪ ਜੀਵਨ ਤੇ ਰਚਨਾ/ਯੋਗਦਾਨ

**ਕੋਰਸ**

1. ਸੁਰ-ਸੰਵੇਦਨਾ, ਸੰਪਾ: ਡਾ.ਸਤਿੰਦਰ ਸਿੰਘ ਵਿੱਚੋਂ ਚੋਣਵੀਆਂ 15 ਕਵਿਤਾਵਾਂ,  
ਪ੍ਰਕਾਸ਼ਕ: ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ ਪਬਲੀਕੇਸ਼ਨ ਬਿਓਰੋ, ਚੰਡੀਗੜ੍ਹ  
(ਭਾਈ ਵੀਰ ਸਿੰਘ- ਗੁਲਾਬ ਦਾ ਫੁੱਲ ਤੋੜਨ ਵਾਲੇ ਨੂੰ, ਵਿਛੋੜਾ-ਵਸਲ, ਖੇੜਾ, ਪੂਰਨ ਸਿੰਘ- ਜਵਾਨ ਪੰਜਾਬ, ਸਮੁੰਦਰ ਕਿਨਾਰੇ ਮੈਂ ਉਡੀਕਾਂ, ਗਰਾਂ ਦਾ ਮਿਹਨਤੀ ਬਲਦ, ਧਨੀ ਰਾਮ ਚਾੜ੍ਹਕ- ਰਾਧਾ ਸੰਦੇਸ਼, ਏਕੇ ਦੀ ਬਰਕਤ, ਪੰਜਾਬੀ ਦਾ ਸੁਪਨਾ, ਮੋਹਨ ਸਿੰਘ- ਮਾਂ, ਦੇਸ਼ ਪਿਆਰ, ਹਵਾ ਦਾ ਜੀਵਨ ਅਤੇ ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ- ਆਖਾਂ ਵਾਰਸ ਸ਼ਾਹ ਨੂੰ, ਸੱਤ ਵਰ੍ਹੇ ਅਤੇ ਅਸ਼ੋਕਾ ਚੇਤੀ ਕਵਿਤਾਵਾਂ)
2. ਪੰਜਾਬੀ ਕਥਾ-ਕਿਤਾਬ, ਸੰਪਾ: ਗੁਰਦਿਆਲ ਸਿੰਘ ਵਿੱਚੋਂ ਚੋਣਵੀਆਂ 6 ਕਹਾਣੀਆਂ  
ਪ੍ਰਕਾਸ਼ਕ: ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਓਰੋ, ਚੰਡੀਗੜ੍ਹ।  
(ਏਹੁ ਨਿਦੇਸਾ ਮਾਰੀਐ, ਸਵਰਗ ਦੀ ਝਲਕ, ਮਾਮਲਾ, ਉਜਾੜ, ਬਸ਼ੀਰਾ ਅਤੇ ਰੱਬ ਤੇ ਰੁੱਤਾਂ ਕਹਾਣੀਆਂ)

**ਯੂਨਿਟ ਅਤੇ ਥੀਮ**

- |  |       |
|--|-------|
| 1. ਸੁਰ-ਸੰਵੇਦਨਾ ਪੁਸਤਕ ਵਿੱਚੋਂ ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ (2 ਵਿੱਚੋਂ 1)  | 5 ਅੰਕ |
| 2. ਕਿਸੇ ਇੱਕ ਕਵਿਤਾ ਦਾ ਸਾਰ ਜਾਂ ਕੇਂਦਰੀ ਭਾਵ (3 ਵਿੱਚੋਂ 1)   | 5 ਅੰਕ |
| 3. ਇੱਕ ਕਹਾਣੀ ਦਾ ਸਾਰ (ਪੰਜਾਬੀ ਕਥਾ-ਕਿਤਾਬ ਵਿੱਚੋਂ)  | 5 ਅੰਕ |
| 4. ਕਿਸੇ ਇੱਕ ਕਵੀ ਜਾਂ ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਰਚਨਾ ਅਤੇ ਯੋਗਦਾਨ<br>(ਭਾਈ ਵੀਰ ਸਿੰਘ, ਪ੍ਰੋ.ਮੋਹਨ ਸਿੰਘ, ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ, ਸੁਜਾਨ ਸਿੰਘ, ਸੰਤੋਖ ਸਿੰਘ ਧੀਰ ਅਤੇ ਕੁਲਵੰਤ ਸਿੰਘ ਵਿਰਕ)<br>(2 ਵਿੱਚੋਂ 1, ਇੱਕ ਕਵੀ ਅਤੇ ਇੱਕ ਕਹਾਣੀਕਾਰ ਵਿੱਚੋਂ) | 8 ਅੰਕ |
| 5. ਲੇਖ : ਸਮਾਜਕ, ਸਭਿਆਚਾਰਕ ਅਤੇ ਆਮ ਵਾਕਫੀ ਨਾਲ ਸੰਬੰਧਤ (500 ਸ਼ਬਦਾਂ ਤੱਕ)  | 7 ਅੰਕ |
| 6. ਸ਼ਬਦ ਸ਼ੁੱਧੀ (10 ਅਸ਼ੁੱਧ ਸ਼ਬਦ-ਜੋੜਾਂ ਵਿੱਚੋਂ 7)   | 7 ਅੰਕ |
| 7. ਵਾਕ ਸ਼ੁੱਧੀ (10 ਅਸ਼ੁੱਧ ਵਾਕਾਂ ਵਿੱਚੋਂ 8)   | 8 ਅੰਕ |

ਵਿਸ਼ੇਸ਼ ਨੋਟ : ਸਮੁੱਚੇ ਪਾਠ ਕ੍ਰਮ ਲਈ ਹਫ਼ਤੇ ਵਿਚ 6 ਪੀਰੀਅਡ

**OR**

## **HISTORY AND CULTURE OF PUNJAB – I**

### **Instructions for the paper-setter and candidates: (for paper in Semester I & II)**

1. The syllabus has been divided into four Units.  
There shall be 9 questions in all. The first question is compulsory and shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 25 to 30 words each. The candidates are required to attempt any 5 short answer type questions. Each question will carry 1 mark. Rest of the paper shall contain 4 units. Each Unit shall have two essay type questions and the candidate shall be given internal choice of attempting one question from each Unit-IV in all. Each question will carry 10 marks.
2. For private candidates, who have not been assessed earlier for internal assessment, the marks secured by them in theory paper will proportionately be increased to maximum marks of the paper in lieu of internal assessment.  
**The paper-setter must put note (2) in the question paper.**
3. One question from Unit-IV shall be set on the map.

### **Explanation:**

1. Each essay type question would cover about one-third or one-half of a topic detailed in the syllabus.
2. The distribution of marks for the map question would be as under:  
Map : 06 Marks  
Explanatory Note : 04 Marks  
In case a paper setter chooses to set a question of map on important historical places, the paper setter will be required to ask the students to mark 6 places on map of 1 mark each and write explanatory note on any two of 2 marks each.
3. The paper-setter would avoid repetition between different types of question within one question paper.

## **PAPER : HISTORY AND CULTURE OF PUNJAB FROM THE EARLIEST TIMES TO 1849**

Max. Marks	:	50
Theory	:	45
Internal Assessment	:	05
Time	:	3 Hours

**Objectives:** To introduce the students to the history of the Punjab region.

**Pedagogy:** Lectures, library work and discussions.

### **UNIT I**

1. Harappan Civilization: extent and town planning and socio-economic life.
2. Life in Vedic Age: socio-economic and religious.
3. Growth of Jainism and Buddhism in Punjab on the region.

### **UNIT II**

4. Society and Culture under Maurayas

5. Society and Culture under Gupta
6. Cultural Reorientation: main features of Bhakti; origin and development of Sufism

### UNIT III

7. Evolution of Sikhism: teaching of Guru Nanak; Institutional Development -Manji, Masand, Sangat and pangat.
8. Transformation of Sikhism: martyrdom of Guru Arjan; martyrdom of Guru Tegh Bahadur; impact.
9. Institution of Khalsa: new baptism; significance

### UNIT IV

10. Changes in Society in 18<sup>th</sup> century: social unrest; emergence of misls and institutions-rakhi, gurmata, dal khalsa.
11. Society and Culture of the people under Maharaja Ranjit Singh
12. MAP (of undivided physical geographical map of Punjab): Major Historical Places: Harappa, Mohenjodaro, Sanghol, Ropar, Lahore, Amritsar, Kiratpur, Anandpur Sahib, Tarn Taran, Machhiwara, Goindwal, Khadur Sahib.

### Suggested Readings:

1. Joshi, L.M (ed.) : History and Culture of the Punjab, Part-I, Publication Bureau, Punjabi University, Patiala, 1989 (3<sup>rd</sup> edn.)
2. Joshi, L.M and Singh, Fauja (ed.) : History and Culture of the Punjab, Vol. I, Punjabi University, Patiala, 1977
3. Prakash, Buddha : Glimpses of Ancient Punjab, P.U., Patiala, 1983
4. Thapar, Romila : A History of India, Vol. I, Penguin Books, 1966
5. Basham, A.L : The Wonder That was India, Rupa Books, Calcutta (18<sup>th</sup> rep.),1992
6. Sharma, B.N : Life in Northern India, Munshi Ram Manohar Lal, Delhi,1966
7. Singh,Kirpal : History and Culture of the Punjab, Part II(Medieval Period), Publication Bureau, Punjabi University, Patiala 1990(3<sup>rd</sup> edn.).
8. Singh, Fauja(ed.) : History of the Punjab, Vol.III, Punjabi University, Patiala, 1972
9. Grewal, J.S. : The Sikhs of the Punjab, the New Cambridge History of India, Orient Longman, Hyderabad,1990.
10. Singh, Khuwant : A History of the Sikhs, vol I: 1469-1839, Oxford University Press Delhi, 1991.
11. Chopra, P.N.,Puri, B.N.:A Social, Cultural and Economic History of India, Vol. II, and Das, M.N. Macmillan, Delhi, 1974.
12. Hussain ,Yusuf : Glimpse of Medieval Indian Culture, Asia Publishing House, Bombay, 1973(rep.).

Note: The following categories of the students shall be entitled to take option of History & Culture of Punjab in lieu of Punjabi as compulsory subject:

- A. That the students who have not studied Punjabi up
- B. to class 10<sup>th</sup>.
- C. Ward of / and Defence Personnel and Central Govt. Employee/Employees who are transferrable on all India basis.
- D. Foreigners

## **Information System Design and Implementation** **BCA-16-303**

**L     T     P     Cr**  
**6     -     -     3**

**External Marks: 65**  
**Internal Marks: 10**

**Time Duration: 3 Hrs.**

Number of Lectures : 60

**Objective:** To teach the students about the various aspects of Information Systems to be developed, their analysis and design. The motive is to aware the learners about pre requisite of software development and associated paradigms. After completing this course students will be able to analyse and design information systems.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.

### **UNIT - I**

**Systems Concepts and Information Systems Environment:** Definition and characteristics of a system. Elements of a system Environment: Boundaries and interface. Types of systems: Physical or Abstract Systems, Open and Closed System, Man - made information systems.

**The System Development Life Cycle:** Introduction to various phases-Recognition of Need, Feasibility Study, Analysis, Design, Implementation, Post- Implementation and Maintenance.

**The Role of System Analyst:** Skills of a System Analyst, various roles of the Analyst.

### **UNIT - II**

**System Planning and the Initial Investigation:** Bases for planning in system analysis, Initial investigation, determining the users information requirements, Problem definition and Project Initiation, Background Analysis, Fact Finding, Fact Analysis, Determination of Feasibility.

**Information Gathering:** Introduction, Information Gathering tools: Review of Literature, Procedures and forms. On -site observation. Interviews and questionnaires.

**Tools of Structured Analysis:** Various tools of structured analysis: Data flow diagram (DFD), Data Dictionary, Decision tree and structured English, Decision table, Pros and cons of each tools.

### **UNIT - III**

**Feasibility Study:** System Performance-statement of Constraints, Identification of Specific System Objectives, description of Outputs. Feasibility Study – Feasibility considerations, Steps in feasibility analysis. Feasibility Report.

**System Design:** The Process of Design-Logical and Physical Design, Design methodologies: Structured design, Functional Decomposition

**System Testing and Quality Assurance:** Testing, System testing, Quality assurance and its goals in its system life cycle, Levels of quality assurance, Trends in testing.



## UNIT - IV

**Implementation and Software Maintenance:** Introduction, Conversion- Activity network for Conversion, File Conversion, User Training: Elements of user Training Post implementation review. Software Maintenance - Primary activities of a Maintenance Procedure, Reducing Maintenance Costs.

**Hardware and Software Selection:** Types of Software, Procedure for Hardware/Software selection: Major phases in selection, Evaluation and Validation, Vendor Selection, Post – Installation Review. Software selection- Criteria for Software Selection, the evaluation process.

### **Suggested Readings:**

#### **Essential :**

1. E.M. Awad: Systems Analysis and Design, Galgotia Publications(P)Ltd.

#### **Further Reading :**

2. Hardgrave Bill C., Siau Keng, Chiang Roger H.L., Systems Analysis and Design : Techniques, Methodologies, Approaches and Architectures 1<sup>st</sup> Edition, M.E. Sharpe Publications.

# Computer Oriented Numerical Methods

BCA-16-304

L	T	P	Cr
6	1	-	3

External Marks: 65  
Internal Marks: 10

Time Duration: 3 Hrs.

Number of Lectures : 60

**Objective:** To teach the students the essential techniques of Numerical Methods. After completing this course students will be able to solve various Scientific and Engineering fields' problems.

**Note :**

- The Question Paper will consist of Four Units.
- Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- All questions carry equal marks unless specified.
- The student can use only Non-programmable & Non-storage type of Calculator.**
- Log tables are allowed. Students may be provided the same for computation.**

## UNIT - I

**Data Representation and Computer Arithmetic:** Introduction, Concept of Exact and Approximate Numbers, Concept of Significant digits, Representation of Numbers in Memory, Storage of Integer Numbers: Signed Representation, 1's Complement Representation, 2's Complement Representation, Floating Point Numbers and their storage, Floating Point Arithmetic, Normalization and their consequences, Errors, Measures of Accuracy: Absolute Error, Relative Error and Percentage Error, Error types: Data Errors, Truncation Errors, Round-Off Errors, Computational Errors, Rules, Relationship between Relative Error and Significant digits and Error Propagation: Error Propagation in Addition Operation, Subtraction Operation, Multiplication Operation and Division Operation.

## UNIT - II

**Solution of Non-Linear Equations:** Introduction, Types of Non-Linear Equations: Polynomial Equations, Transcendental Equations, Methods of Finding Solutions of Non-Linear equations: Direct Method, Iterative Method.

Iterative Methods: Bisection Method, False-Position Method, Secant Method, Newton - Raphson Methods, Zeros of a polynomial using Birge – Vieta Method. Convergence of Iterative Methods: Convergence of Bisection Method, Convergence of False Position Method, Convergence of Newton- Raphson Method, Convergence of Secant Method, Comparison between Iterative Methods.

**Simultaneous Linear Equations:** Solution of Simultaneous Linear Equations using Direct and Iterative Methods: Direct Methods: Gauss – Elimination Method, Gauss-Jordan Method, Concept of Pivoting, Iterative Method: Gauss-Seidal Method.

### UNIT - III

**Interpolation:** Introduction, Lagrange Interpolation, Inverse Interpolation, Finite Differences: Forward Differences, Backward Differences, Divided Differences, Difference Tables: Forward Difference Table, Backward Difference Table, Divided Difference Table, Observations regarding Difference Tables, Newton's Method of Interpolation: Newton's Forward Difference Interpolation Formula, Newton's Backward Difference Interpolation Formula, Newton's Divided Difference Interpolation Formula.

**Numerical Integration:** Introduction, Newton-Cotes Integration Formulae: Trapezoidal Rule, Simpson's 1/3rd Rule, Simpson's 3/8th Rule.

### UNIT - IV

**Approximation:** Approximation of functions: Taylor Series Representation, Chebyshev Polynomials.

**Solution of Ordinary Differential Equations:** Introduction, Euler's Method, Runge-Kutta Methods: 2nd order & 4th order, Predictor Corrector Methods: Modified Euler's Method.

#### Suggested Readings:

##### Essential :

1. Salaria,R.S. : Computer Oriented Numerical Methods,5<sup>th</sup> Edition, Khanna Book Publishing Co. (P.) Ltd., New Delhi

##### Further Reading :

2. Rajaraman,V.,2004 : Computer Programming in C, Prentice Hall of India.
3. S.S. Shastry : Introductory Methods of Numerical Analysis
4. H.C. Saxena : Finite differences and Numerical Analysis

# Data Structures

BCA-16-305

L     T     P     Cr  
6     -     -     3

External Marks: 65  
Internal Marks: 10

Time Duration: 3 Hrs.

Number of Lectures : 60

**Objective:** To teach the students various data structures and the basic operations performed using them. At the end of course the student will have complete knowledge of data structures, thus will be able to use them for solving real world problems.

## Note :

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.

## UNIT - I

**Basic Concepts:** Introduction to Complexity, Data Structure and Data Structure operations. Applications of Data Structure, Basic data Structures.

**Arrays:** Introduction, Types of Array, Memory representation, Applications and operations.

**Stacks:** Introduction, memory representation, Applications and operations

## UNIT - II

**Linked List:** Operations:-traversing, searching, inserting, deleting, operations on header linked list, circular linked list, doubly linked list, memory representation, Applications, polynomial manipulation.

**Queue:** Introduction, Types, Memory Representation and Applications.

## UNIT - III

**Trees** – Definition and Basic concepts, Representation in Contiguous Storage, Binary Tree, Binary Tree Traversal, Searching, Insertion and deletion in Binary trees, Binary Search tree.

**Graphs:** Introduction, Memory Representation, Graph Traversal (DFS and BFS)

## UNIT - IV

**Searching:** Binary and Linear Search;

**Sorting:** Bubble sort, Insertion sort, Selection sort, Merge Sort, Quick sort.

Comparison of various Searching and Sorting algorithms.

:

**Suggested Readings :**

**Essential :**

1. Lipschultz L. Seymour, 2001 : Data Structure, Schaum Outline Series, TMH, New Delhi.

**Further Reading :**

2. Tannenbaum, Aaro M., 1990 : Data Structure Using C, Pearson.
3. Salaria, R. S. : Data Structures & Algorithm Using C, Khanna Book Publishing Co. (P.) Ltd., New Delhi.
4. Salaria, R. S., Test Your Skills in Data Structures, Khanna Book Publishing Co. (P.) Ltd., New Delhi.
5. Sofat Sanjeev, Data Structure with C and C++, Khanna Book Publishing Co.
6. Patel, R.B., Expert Data Structure in C, Khanna Book Publishing Co.

FOURTH  
SEMESTER

ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ

ਅਪ੍ਰੈਲ /ਮਈ 2018 ਦੇ ਇਮਤਿਹਾਨ ਲਈ

ਕੁੱਲ ਅੰਕ : 50

ਬਿਊਰੀ : 45

ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ: 05

ਸਮਾਂ: 3 ਘੰਟੇ

ਸਿਲੇਬਸ

1. ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵੀਆਂ ਦੀਆਂ ਚੋਣਵੀਆਂ ਕਵਿਤਾਵਾਂ ਦਾ ਅਧਿਐਨ
2. ਚੋਣਵੀਆਂ ਪੰਜਾਬੀ ਕਹਾਣੀਆਂ ਦਾ ਅਧਿਐਨ
3. ਚੋਣਵੇਂ ਪੰਜਾਬੀ ਲੇਖਕਾਂ ਦਾ ਸੰਖੇਪ ਜੀਵਨ ਤੇ ਰਚਨਾ/ਯੋਗਦਾਨ

ਕੋਰਸ

1. ਸੁਰ-ਸੰਵੇਦਨਾ, ਸੰਪਾ: ਡਾ.ਸਤਿੰਦਰ ਸਿੰਘ ਵਿੱਚੋਂ ਚੋਣਵੀਆਂ 15 ਕਵਿਤਾਵਾਂ, ਪ੍ਰਕਾਸ਼ਕ: ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ ਪਬਲੀਕੇਸ਼ਨ ਬਿਓਰੋ, ਚੰਡੀਗੜ੍ਹ  
(ਫੀਰੋਜ਼ਦੀਨ ਸ਼ਰਫ- ਪੰਜਾਬ, ਭਾਰਤ, ਮਾਂ ਦਾ ਦਿਲ, ਨੰਦ ਲਾਲ ਨੂਰਪੁਰੀ- ਭੋਲਾ ਪੰਛੀ, ਚੁੰਮ ਚੁੰਮ ਰਖੋ, ਸ਼ੌਂਕਣ ਮੇਲੇ ਦੀ, ਸ਼ਿਵ ਕੁਮਾਰ- ਲੱਛੀ ਕੁੜੀ, ਕੀ ਪੁੱਛਦਿਉ ਹਾਲ ਫਕੀਰਾਂ ਦਾ, ਬਿਰਹੜਾ, ਪਾਸ਼- ਇਨਕਾਰ, ਅਸੀਂ ਲੜਾਂਗੇ ਸਾਥੀ, ਗੀਤ, ਸੁਰਜੀਤ ਪਾਤਰ- ਖ਼ਤਾਂ ਦੀ ਉਡੀਕ, ਗਜ਼ਲ (ਕੋਈ ਡਾਲੀਆਂ 'ਚੋਂ) ਅਤੇ ਗਜ਼ਲ (ਮੇਰਾ ਸੂਰਜ ਡੁਬਿਆ ਹੈ) ਕਵਿਤਾਵਾਂ)
2. ਪੰਜਾਬੀ ਕਥਾ-ਕਿਤਾਬ, ਸੰਪਾ: ਗੁਰਦਿਆਲ ਸਿੰਘ ਵਿੱਚੋਂ ਚੋਣਵੀਆਂ 6 ਕਹਾਣੀਆਂ, ਪ੍ਰਕਾਸ਼ਕ: ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਓਰੋ, ਚੰਡੀਗੜ੍ਹ।  
(ਗਧੀ ਵਾਲਾ, ਕੁਰਸੀ, ਬਾਕੀ ਸਭ ਸੁੱਖ-ਸਾਂਦ ਹੈ, ਰੋਹੀ ਬੀਆਬਾਨ, ਜਿੱਥੋਂ ਸੂਰਜ ਉੱਗਦਾ ਹੈ ਅਤੇ ਪਰਛਾਵੇਂ ਕਹਾਣੀਆਂ)

ਯੂਨਿਟ ਅਤੇ ਥੀਮ

- |    |   |       |
|----|---|-------|
| 1. | ਸੁਰ-ਸੰਵੇਦਨਾ ਪੁਸਤਕ ਵਿੱਚੋਂ ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ (2 ਵਿੱਚੋਂ 1)  | 5 ਅੰਕ |
| 2. | ਕਿਸੇ ਇੱਕ ਕਵਿਤਾ ਦਾ ਸਾਰ ਜਾਂ ਕੇਂਦਰੀ ਭਾਵ (4 ਵਿੱਚੋਂ 1)   | 5 ਅੰਕ |
| 3. | ਇਕ ਕਹਾਣੀ ਦਾ ਸਾਰ (ਪੰਜਾਬੀ ਕਥਾ-ਕਿਤਾਬ ਵਿੱਚੋਂ)   | 5 ਅੰਕ |
| 4. | ਕਿਸੇ ਇੱਕ ਕਵੀ ਜਾਂ ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਰਚਨਾ ਅਤੇ ਯੋਗਦਾਨ<br>(ਸ਼ਿਵ ਕੁਮਾਰ, ਪਾਸ਼, ਸੁਰਜੀਤ ਪਾਤਰ, ਗੁਰਦਿਆਲ ਸਿੰਘ, ਰਘੁਬੀਰ ਢੰਡ ਅਤੇ ਵਰਿਆਮ ਸੰਧੂ)<br>(2 ਵਿੱਚੋਂ 1, ਇੱਕ ਕਵੀ ਅਤੇ ਇੱਕ ਕਹਾਣੀਕਾਰ ਵਿੱਚੋਂ) | 8 ਅੰਕ |
| 5. | ਕਾਲਜ ਨਾਲ ਸਬੰਧਤ ਪ੍ਰੈਸ-ਨੋਟ (2 ਵਿੱਚੋਂ 1)   | 8 ਅੰਕ |
| 6. | ਕਾਰੋਬਾਰੀ ਇਸ਼ਤਿਹਾਰ (2 ਵਿੱਚੋਂ 1)  | 7 ਅੰਕ |
| 7. | ਵਿਸ਼ਰਾਮ ਚਿੰਨ੍ਹ<br>ਵਿਸ਼ੇਸ਼ ਨੋਟ : ਸਮੁੱਚੇ ਪਾਠ ਕ੍ਰਮ ਲਈ ਹਫ਼ਤੇ ਵਿਚ 6 ਪੀਰੀਅਡ   | 7 ਅੰਕ |

OR

**HISTORY AND CULTURE OF PUNJAB-II**

**Instructions for the paper-setter and candidates: (for paper in Semester I & II)**

1. The syllabus has been divided into four Units.  
There shall be 9 questions in all. The first question is compulsory and shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 25 to 30 words each. The candidates are required to attempt any 5 short answer type questions. Each question will carry 1 mark. Rest of the paper shall contain 4 units. Each Unit shall have two essay type questions and the candidate shall be given internal choice of attempting one question from each Unit-IV in all. Each question will carry 10 marks.
2. For private candidates, who have not been assessed earlier for internal assessment, the marks secured by them in theory paper will proportionately be increased to maximum marks of the paper in lieu of internal assessment.  
**The paper-setter must put note (2) in the question paper.**
3. One question from Unit-IV shall be set on the map.

**Explanation:**

1. Each essay type question would cover about one-third or one-half of a topic detailed in the syllabus.
2. The distribution of marks for the map question would be as under:  
Map : 06 Marks  
Explanatory Note : 04 Marks  
  
In case a paper setter chooses to set a question of map on important historical places, the paper setter will be required to ask the students to mark 6 places on map of 1 mark each and write explanatory note on any two of 2 marks each.
3. The paper-setter would avoid repetition between different types of question within one question paper.

**PAPER: HISTORY AND CULTURE OF PUNJAB IN THE COLONIAL AND POST INDEPENDENCE TIMES**

Max. Marks	:	50
Theory	:	45
Internal Assessment	:	05
Time	:	3 Hours

- Objectives:** To introduce the students to the history of Punjab region in the Modern times.  
**Pedagogy:** Lectures, library work and discussions.

**UNIT I**

1. Introduction of Colonial Rule in Punjab: Annexation of Punjab, Board of Administration
2. Western Education: Growth of Education and rise of middle classes
3. Agrarian Development: Commercialization of agriculture; canalization and colonization.



## UNIT II

4. Early Socio Religious Reform: Christian Missionaries; Namdharis; Nirankaris.
5. Socio Religious Reform Movements: activities of Arya Samaj; Singh sabhas; Ahmadiyas.
6. Development of Press & literature: growth of press; development in literature

## UNIT III

7. Emergence Of Political Consciousness: Agrarian uprising 1907; Ghadar Movement.
8. Gurudwara Reform Movement: Jallianwala Bagh; foundation of SGPC and Akali Dal; Morchas; Activities of Babbar Akalis.
9. Struggle for Freedom: activities of revolutionaries - Naujawan Bharat Sabha; Kirti Kissan Movement; participation in mass movements – non co-operation, civil disobedience, Quit India.

## UNIT IV

10. Partition and its Aftermath: resettlement; rehabilitation
11. Social Concerns In Post Independence Punjab: language; immigration; socio-economic issues.
12. MAP(Physical geographical map of undivided Punjab): Major Historical places: Delhi, Kurukshetra, Jaito, Ferozepur, Ambala, Amritsar, Lahore, Ludhiana, Qadian, Jalandhar, Lyallpur, Montgomery.

### Suggested Readings:

1. Singh, Kirpal :History and Culture os the Punjab, Part II(Medieval Period), Publication Bureau, Punjabi University, Patiala 1990(3<sup>rd</sup> edn.).
2. Singh, Fauja(ed.) :History of the Punjab, Vol.III, Punjabi University, Patiala 1972.
3. Grewal, J.S. :The Sikhs of the Punjab, the New Cambridge History of India, Orient Longman, Hyderabad,1990.
4. Singh, Khuwant :A History of the Sikhs, vol I: 1469-1839, oxford University Press,. Delhi, 1991.
5. Chopra, P.N.,Puri, B.N.:A Social, Cu.ltural and Economic History of India, Vol.II, And Das,M.N. Macmillan, delhi, 1974.

# Software Project Management

## BCA-16-403

L T P Cr  
6 - - 3

External Marks: 65  
Internal Marks: 10

Time Duration: 3 Hrs.

Number of Lectures : 60

**Objective:** To teach the students important concepts, terms related to various phases during the development of a software project. At the end of the course the student will be able to apply software project management techniques to manage a software project.

### Note :

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.

### UNIT - I

**Software Project Management and Process Groups:** Introduction to project and project management, role of a project manager in project management, a system view of project management, Stakeholders of Project, Project phases and product life cycles, Evolution of software economics, Improving software economics: reducing product size, software processes, team effectiveness, automation through software environments, Principles of modern software management.

### UNIT - II

**Project Management Framework:** Project Management Framework, Software Tools for Project Management, Issues in Project Staff Acquisition and Team formation and Development, Model based software architectures, Workflows of the process, Checkpoints of the process.

**Project Integration:** Integration Management: Project selection, project management plans, project execution, project monitoring and controlling, integrated change control;

### UNIT - III

**Scope Management:** Scope Management: project scope statement, Work breakdown structures, Scope verification and scope control, Process instrumentation and seven core metrics.

**Software management disciplines:** Iterative process planning, Project organizations and responsibilities, Process automation.

## UNIT - IV

**Project Scheduling:** Time Management; Importance of Project Schedules, Sequencing and Scheduling Activity, Project Network Diagrams, PERT/CPM, Gantt charts, Critical chain scheduling.

**Cost Management:** Project Cost Management - Importance and Principles of Project Cost Management, Resource Planning, Cost Estimating Techniques and. Expert Judgment, Estimating by Analogy, COCOMO Model, Cost Budgeting and Control

### **Suggested Readings :**

#### **Essential :**

1. Kathy Schwalbe, Information Technology Project management, Thomson Publication.
2. Bob Hughes and Mike Cotterell, Software Project Management, Tata McGraw-Hill.

#### **Further Reading :**

3. Walker Royce, Software Project Management - A Unified, Addison-Wesley.
4. Pankaj Jalote, Software Project Management in Practice, Pearson Education.
5. S.A. Kelkar, Software Project Management, A Concise Study, Prentice-Hall India.

# Operating System Concepts and Linux

## BCA-16-404

**L**    **T**    **P**    **Cr**  
**6**    **-**    **-**    **3**

**External Marks: 65**  
**Internal Marks: 10**

**Time Duration: 3 Hrs.**

Number of Lectures : 60

**Objective:** The objective of the module is to create skills of students in operating systems concepts and Linux commands.

### **Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.

### **UNIT - I**

Operating Systems (OS): Introduction, its needs and services, Types of OS: Multi-user, Multitasking, Multiprocessing and Real time Operating Systems, Parallel systems, Distributed systems

Process Management: Introduction to Process, PCB, Process States, CPU Scheduling: Scheduling Criteria and Algorithms: FCFS, SJF, Priority, Round Robin, Multilevel Queue Scheduling, Multilevel Feedback Queue Scheduling

### **UNIT - II**

Deadlocks: Necessary and sufficient conditions for Deadlocks, Introduction to methods for handling deadlocks, deadlock detection and recovery

Memory Management: Logical vs Physical address space, Swapping, Introduction to Paging, Segmentation, Virtual Memory-Demand paging, Introduction to Page Replacement algorithms: FIFO, Optimal Page replacement and LRU

### **UNIT - III**

Introduction to Linux: Linux's shell, Kernel, Features of Linux, History, Minimum system requirements, Boot and Root disks , Starting and stopping Linux system, passwords, logging in and out, terminal Handling commands: who, Understanding wildcards, Environment variables.

Understanding I/O Redirection and Piping: Introduction, cut, paste, sort, tee; Introduction to Regular Expressions and grep .

Using file system: Introduction to common types of files, Filenames, Introduction to different types of directories: Parent, Subdirectory, Home directory; rules to name a directory, Important directories in Linux File System, Absolute and relative filenames,

creating files and directories, listing files (ls), pwd, moving and copying files (mv, cp), moving directories, Removing files and directories, using wildcards with files and directories, File and directory permissions using relative and absolute methods, Changing group ownership, umask settings

## UNIT - IV

Process Management: Types of processes, ps, bg, fg, nice, kill.

Understanding System Administration activities: Superuser (su) command, Taking backups using tar, Managing disk space, Mounting and Un-mounting file system, Managing users, Managing printers with lpd, mknod, lpc, lpq, lprm.

Vi editor: starting vi, vi modes, inserting text, quitting vi, deleting text, copying and moving text, searching and replacing text.

### **Suggested Readings:**

#### **Essential :**

1. Peterson, J.L.& Silberschatz, A., Operating System Concept, Addison Wesley, reading.
2. John Goerzen: Linux Programming Bible, IDG Books, New Delhi, 2000.

#### **Further Reading :**

3. Brinch, Hansen, Operating System Principles, Prentice Hall of India
4. Haberman, A.N., Introducing to Operating System Design Galgotia Publication, New Delh.
5. Sumitabha Das: Your Unix - The Ultimate Guide, TMH, 2000.

# Database Management System

## BCA-16-405

**L**    **T**    **P**    **Cr**  
**6**    **-**    **-**    **3**

**External Marks: 65**  
**Internal Marks: 10**

**Time Duration: 3 Hrs.**

Number of Lectures : 60

**Objective:** This course aims at giving the students the insight of the underlying concepts of database management system and implement them using Database software.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.

### UNIT - I

Basic Concepts: A Historical perspective, File Systems vs. DBMS, Characteristics of the Data Base Approach, Abstraction and Data Integration, Database users, Advantages and Disadvantages of DBMS, Implication of Database approach.

Data Base Systems Concepts and Architecture: Data Models, Schemas and Instances, DBMS architecture and Data Independence, Data base languages & Interfaces, DBMS functions and component modules.

Entity Relationship Model: Entity Types, Entity Sets, Attributes & Keys, Relationships, Relationship Types, Roles and Structural Constraints, Design issues, weak entity types, E-R Diagrams. Design of an E-R Database Schema, Reduction of an E-R Schema to Tables.

### UNIT - II

Relational Data Model : Relational model concepts, Integrity constraints over Relations, Relational Algebra - Basic Operations.

Conventional Data Models : An overview of Network and Hierarchical Data Models.

Relational Data Base Design : Functional Dependencies, Decomposition, Desirable properties of decomposition, Normal forms based on primary keys (1 NF, 2 NF, 3 NF and BC NF).

**RDBMS:** Terminology, The 12 Rules (Codd's Rule) for an RDBMS.

### UNIT - III

**Understanding SQL-1:** Data Types, Creating Tables, Creating a Table with data from Another table, Inserting Values into a Table, Updating Column(s) of a Table, Deleting Row(s) from a Table, Dropping a Column, Querying database tables, Conditional retrieval

of rows, Working with Null Values, Matching a pattern from a table, ordering the result of a Query Aggregate Functions, Grouping the Result of a Query, creation and deletion of Views, Managing privileges with Grant and Revoke Command, COMMIT and ROLLBACK, Functions: Character Functions, Date Functions, Group Functions

## UNIT - IV

**Understanding SQL-II:** Querying Multiple Tables using Equi-Joins, Cartesian Joins, Outer Joins, Self-Joins, SET Operators: Union, Intersect, Minus; Introduction to Nested Queries

**PL/SQL:** Introduction to PL/SQL, The Advantage of PL/SQL, PL/SQL Block Structure, PL/SQL Architecture, Fundamentals of PL/SQL, PL/SQL Data Types, Variables and Constants, Scope and Visibility of a Variable, Assignments and Expressions, Operator Precedence, Conditional and Iterative Control, Cursor Management in PL/SQL, Implicit/explicit Cursor Attributes, Exception Handling in PL/SQL; Predefined Exceptions, User Defined Exceptions, Database Trigger, types of triggers, dropping triggers, storage for triggers.

### Suggested Readings:

#### Essential

1. Elmasri & Navathe: Fundamentals of Database systems, 3rd Edition, Addison Wesley, New Delhi.
2. Ivan Bayross : SQL, PL/SQL-The Program Language of ORACLE, BPB Publication, New Delhi.

#### Further Reading :

3. Korth & Silberschatz : Database System Concept, 4th Edition, McGraw Hill International Edition.
4. Raghu Ramakrishnan & Johannes Gehrke: Database Management Systems, 2nd edition, McGraw Hill International Edition.
5. C.J.Date : An Introduction to Data bases Systems 7th Edition, Addison Wesley, New Delhi.
6. Bipin C.Desai : An Introduction to Database System, Galgotia Publication, New Delhi
7. Abbey, Abramson & Corey : Oracle 8i-A Beginner's Guide Tata McGraw Hill Publishing Company Ltd.

# FIFTH SEMESTER



SYLLABI AND COURSES OF READING FOR  
BACHELOR OF COMPUTER APPLICATIONS

Paper Code : BCA – 501  
Paper Title : Entrepreneurship Development Programme  
Theory Marks : 90  
Number of Lectures : 100  
(45 minutes duration)

Objectives : EDP aims at training various target groups in entrepreneurial traits so that they obtain adequate information, motivation and guidance in setting up their own enterprises.

In order to maintain a homogeneous nature of participating groups, EDP focuses on rural entrepreneurs, women, SC/ST and minority communities etc.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.
- v. **The student can use only Non-programmable & Non-storage type of Calculator.**
- vi. **Log tables are allowed. Students may be provided the same for computation.**

**UNIT – I**

1. Project Formulation : Need, Scope and approaches for project formulation; structure of project report; study and analysis of sample project report; preparation of a project report; Techno- economic feasibility of the project.  
(No. of Periods : 25)

**UNIT – II**

2. Finance & Accounting : Working capital assessment, its management & exercise thereon; Assessment of fixed capital and exercise thereon; Capital budgeting; Product costing and cost consciousness. Financial ratios and their significance; Break-even analysis; Credit institutions and financing procedures; Books of accounts, financial statements & fund flow analysis.  
(No. of Periods : 25)

**UNIT – III**

3. Managing the Enterprise : Resource management – men, material, money and machines; Personnel management, Office management.

E-Commerce: Introduction to E-Commerce, Benefits, Impact of E-Commerce, Classification of E- Commerce, Application of E-Commerce.

(No. of Periods : 25)

## UNIT - IV

4. Rules & Regulations: Licensing and Registration procedure; Appreciation of important provisions of Factory Act, Shops & Commercial Establishment Act; Sales of Goods Act, Partnership Act; Contract Act; Income Tax, Sales Tax and Excise rules; Insurance.

(No. of Periods : 25)

### Suggested Readings :

1. Sinha, A.K, 1983. : Project Engineering & Management, Vikas Publishing House Pvt. Ltd., 1983.
2. Srivastava, U. K., 1981 : Project Planning, Financing, Implementation & Evaluation, Indian Institute of Management, Ahmedabad,1981.
3. Kuchhal, S. C., 1982 : Financial Management - An Analytical and Conceptual
4. Mohan, 1982 : Principles of Management Accounting, Mohan & Goyal, Agra Sahitya Bhavan,1982.
5. Saroja, 1979 : Management of Small Scale Industries, Seth Publishers, Bombay, 1979.
6. Vepa Ram K., 1984 : How to Succeed in Small Industry, Vikas Publishing House, New Delhi, 1984.
7. Bare Acts : Central Sales Tax Act, State Sales Tax Act, Central Excise Act and Customs Act.
8. Bhagwati Prasad, 1972 : Law and Practice of Income Tax in India, Navman Prakashan.
9. Gulshan, S. S., 1979 : A Text Book of Commercial Law, S. Chand & Co.
10. Gupta, B. P., 1986 : Industrial Relations, (PHD Chamber of Commerce & Inds.).

Paper Code : BCA - 502  
Paper Title : Principles of Computer Graphics & Multimedia Technology  
Theory Marks : 90

Number of Lectures : 100  
(45 minutes duration)

Objectives :

- To study the various graphical techniques..
- To study the multimedia concepts and various I/O technologies.
- To enable the students to develop creative graphics based programs.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.
- v. **The student can use only Non-programmable & Non-storage type of Calculator.**
- vi. **Log tables are allowed. Students may be provided the same for computation.**

## UNIT - I

### Computer Graphics :

1. A Survey of Computer Graphics :  
Computer Aided Design, Presentation Graphics, Computer art, Entertainment, Education and Training, Visualization, Image Pressing, Graphical User Interfaces.  
(No. of Periods : 15)
2. Overview of Graphics Systems :  
Video Display Devices, Raster Scan Systems, Random Scan Systems. Coloring technique : Beam Penetration, Shadow Mask. Graphics Monitors: Plasma Panel, LED, LCD. Properties of Display Devices : Persistence , Resolution, Aspect Ratio. and Workstations, Input Devices, Hard-copy devices, Graphics Software. Interactive Graphics, Passive Graphics.  
(No. of Periods : 10)

## UNIT - II

3. Studying the Features and Developing Computer Graphics Using Standard Graphics packages like Auto CAD and Photoscape.

AutoCAD: Features, Workspace, Commands to draw line, Polyline, rectangle, polygon, circle, spline, hatch; Modification Commands: Erase, copy, move, mirror, scale, Pan, Zoom, esc, cl, trim; Layer, Dimension, image rotation, area calculation.

(No. of Periods : 10)

4. Developing Computer Graphics Using 'C' : Input-output primitives, Setting character and text attributes, Changing line styles, Using fill styles to fill images.

Use the above primitives to develop programs like drawing concentric circles, Ellipses, Sine curves, Histograms, Pie charts and human face. (No. of Periods : 15)

## UNIT - III

### **Multimedia Technology :**

5. Multimedia in use: Introducing multimedia, uses of multimedia.
6. Technology System Components, Multimedia Platforms, Development Tools, Image, Audio, Video, Storage for multimedia and Communications.
7. Applications :  
Multimedia in the Real World, Training and Education, Image Processing.

(No. of Periods : 25)

## UNIT - IV

8. IMAGE : Introduction, Digital Image, Image Redundancies (Spatial, Spectral, Temporal); Image Compression: lossy and lossless compression Techniques, Run Length Encoding algorithm, Huffman Encoding Algorithm, Discrete Cosine Transform (DCT), Image, video and audio Formats.
9. Studying features and use of Multimedia Image Processing authoring tools like Photoshop and Macromedia Director.

(No. of Periods : 25)

## **Suggested Readings :**

### **Essential :**

1. Hearn and Backe, 1997 : Computer Graphics, Second Edition, PHI, New Delhi.
2. Judith Jeffcoate, 2007 : Multimedia in Practice, Technology and Applications, PHI.

### **Further Reading :**

3. Kanetkar Yashwant, 2003 : Graphics Under 'C', BPB Publications.
4. Judith Jeffcoate, 2007 : Multimedia in Practice, Technology and Applications, PHI.
5. Foley, Vandom, Fenier, : Computer Graphics, Principles and Practice, IV  
Hughes, 1996 Edition in 'C'; Addison Wesley Publishers.
6. Ian R. Sinclair, 1994 : Multimedia on the PC (with CDROM), BPB Publications.
7. Hillman, David, 1998 : Multimedia Technology and Applications, ITP.
8. Vaughan, Tay, 2008 : Multimedia Making it Work, Osborne Publishers.
9. Kelly & Bootle, 1989 : Turbo 'C', BPB Publications.

Paper Code : BCA – 503  
Paper Title : Discrete Mathematics in  
Computer Science  
Theory Marks : 90

Number of Lectures : 100  
(45 minutes duration)

Objectives : Student will learn and revise the knowledge acquired previously. Logic, Relations and Functions, Algebraic Functions and Graph Theory will be introduced in this course.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.
- v. **The student can use only Non-programmable & Non-storage type of Calculator.**
- vi. **Log tables are allowed. Students may be provided the same for computation.**

### UNIT - I

1. Set Theory : Relations and Functions : Set Notation and Description, subset, basic set operations, Venn Diagrams, laws of set theory, partitions of sets, min sets, duality principle, basic definitions of relations and functions, graphics of relations, properties of relations: injective, surjective and bijective functions, compositions.
2. Recurrence : Recurrence Relations and Recursive Algorithms – Linear-Recurrence Relations with Constant Coefficients; Homogeneous Solutions : Particular Solution, Total Solution, Solution by the Method of Generating functions.  
(No. of Periods : 25)

### UNIT - II

3. Graph Theory : Graph and planar graphs – Basic Terminology, Multi-graphs, Weighted Graphs, Paths and Circuits, Shortest Paths, Eulerian Paths and Circuits. Travelling Salesman Problem, Planar Graphs.  
(No. of Periods : 25)

### UNIT - III

4. Automata Theory : Finite State Machines–Equivalent Machines, Finite State Machines as language Recognizers; Analysis of Algorithms - Time Complexity, Complexity of Problems.
5. Boolean Algebra : Lattices and Algebraic Structures; Duality. Distributive and Complemented Lattices, Boolean Lattices and Boolean Algebra.  
(No. of Periods : 25)

## UNIT - IV

6. Boolean Functions and Expressions, Propositional Calculus, Design and Implementation of Digital Networks, Switching Circuits. (No. of Periods : 10)
7. Algebra of Logic : Proposition of logic operations, truth tables and propositions generated by set, equivalence and implication laws of logic, mathematical system, propositions over a universe, mathematical induction, quantifiers. (No. of Periods : 15)

### Suggested Readings :

1. Doerr, A. and Kenneth, L., : Applied Discrete Structures for Computer Science, 1989 Galgotia Publications Pvt. Ltd.
2. Liu, C. L., 1985 : Elements of Discrete Mathematics, McGraw Hill.
3. Seymour Lipschutz and Lipson, : 2000 Solved Problems in Discrete Mathematics, McGraw- Hill. 1992

Paper Code : BCA - 504  
Paper Title : Computer Lab.-1 : Based on BCA - 502  
Theory Marks : 90

# SIXTH SEMESTER



**Paper Code** : **BCA - 601**  
**Paper Title** : **Web Programming**  
**Theory Marks** : **90**

**Number of Lectures : 100**  
**(45 minutes duration)**

Objectives : This course will help the student to design & develop websites using HTML, Javascript and JAVA programming language.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.

**UNIT - I**

1. Review of forms in HTML, *Introduction to cascading style sheets (CSS), defining and applying CSS.*  
Java Script: Features, tokens, data types, variables, operations, control structs, likes, strings arrays, functions, core language, objects, client side objects, event handling. Applications related to client side form validation.

(No. of Periods : 25)

**UNIT - II**

2. Fundamentals of Java: Java Vs. C++, Byte Code, Java virtual machine, constants, variables, data types, operators, expressions, control structures, defining class, creating objects, accessing class members, constructions, method overloading. *String handling.*  
Inheritance : Basics, member access, using super to call super class constructors, creating a multi level hierarchy, method overriding, dynamic method dispatch, using abstract classes, using Final.

(No. of Periods : 25)

**UNIT - III**

3. Packages and Interfaces: Defining a package, understanding CLASSPATH, Access protection: Importing packages, Interfaces, Defining an Interface, Implementing Interfaces, Applying Interfaces, Variables in Interfaces.

Exception Handling: Fundamentals, Exception types, Using Try and Catch, Multiple Try and Catch clauses, Nested Try statements, Built-in exceptions.

(No. of Periods : 25)

## UNIT - IV

4. Multi-threaded Programming: The Java Thread model, Thread priorities, Synchronizations, Messaging. The thread class and runnable interface, The Main Thread : Creating a Thread, Implementing Runnable, Extending Thread, Creating Multiple Threads, Thread Priorities; Synchronizations : Methods, Statements, Inter Thread Communication, Deadlock, Suspending, Resuming and Stopping Threads.

I/O Applets : I/O Basics : Streams, The predefined streams; Reading console I/P, Writing console O/P. The print writer class; Reading and Writing files.

Applet fundamentals, Using AWT controls: AWT Classes, Adding and Removing Controls, Responding to Controls, Controls and their classes, Graphics and Text , Layout Managers: Understanding Layout Manager, FlowLayout, BorderLayout, GridLayout, CardLayout. Menus,-Event handling: Two Event Handling Mechanisms, Delegation Event Model (Events, Event Sources, Event Classes, Event Listeners, Sources of Events, Event Listener Interfaces, Handling Mouse and Keyboard Events.

(No. of Periods : 25)

### Suggested Readings :

#### Essential :

1. Schildt Herbert : Java 2: The Complete Reference, 4<sup>th</sup> Edition, TMH, N.Delhi.
2. Wanger & Wyke, 2000 : Java Script Unleashed, Techmedia, New Delhi, 2000.

#### Further Reading :

3. Daniel Dang, 2010 : An Introduction to Java Programming, PHI, New Delhi.
4. Balaguruswamy, E., 1998 : Programming with Java, A Primer, TMH, New Delhi.

**Paper Code** : **BCA - 602**  
**Paper Title** : **Computer Organisation**  
**Theory Marks** : **90**

**Number of Lectures :**  
**(45 minutes**  
**duration)**

Objectives : This course will enable the student to understand the basic organization of computer system and system maintenance.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.
- v. **The student can use only Non-programmable & Non-storage type of Calculator.**
- vi. **Log tables are allowed. Students may be provided the same for computation.**

**UNIT - I**

1. **Computer Organisation** : Evolution of Computers, Stored program concept and Von Neumann Architecture, Information representation and codes, Combinatorial Blocks : Gates, Multiplexers, Decoders, Encoders, Sequential Building blocks : Flip Flops, Registers, Counters, Arithmetic algorithms : Addition and subtraction for signed magnitude and 2's complement numbers, integer multiplication using shift and add, Booth's algorithms, Integer and floating point representation.

(No. of Periods : 25)

**UNIT - II**

2. **Architecture of a Simple Processor** : An instruction set, Addressing Modes, Instruction formats, Instruction execution in terms of Microinstructions, Concept of interrupt and simple I/O organisation, I/O organization : Strobe based and Handshake based communication, Vector and priority interrupts, DMA based data transfer; CPU organisation with large registers, Stacks and handling of interrupts and subroutines. Concept of Bus, data movement among registers, data movement from/to memory.

(No. of Periods : 25)

**UNIT - III**

3. **Memory Organisation** : RAM, Basic cell of static and dynamic RAM, Building large memories using chips, Associative memory, Cache memory organisation, Virtual memory organisation. Assembly Language Programming : Machine and assembly language, Pseudo operations, subroutines in assembly language, Assembly language programs:-To add/subtract two numbers, Program to input/output one character, Program to demonstrate the use of subroutines. Register Transfer Language and micro-operations; Language to represent conditional data transfer, Arithmetic and logical operations along with register transfer.

(No. of Periods : 25)

## UNIT - IV

4. **System Maintenance**, Physical Inspection of a PC and internal cards, Diagnostics on a PC, Functional description of various modules and cards. *PC Doctor, Norton, Simantac, Steps of Diagnostics*. Viruses, Types of viruses. *Detection, Protection and Cure of Viruses on a PC*.

(No. of Periods : 25)

### **Suggested Readings :**

#### **Essential :**

1. M. Morris Mano, 1993. Computer System Architecture, Prentice Hall International, 3<sup>rd</sup> Ed.,

#### **Further Reading :**

2. P. Pal Choudhri, 1994. Computer Organisation and Design, Prentice Hall of India.
3. Biswal, Sadasiva, 2001 Basic Electronics, Pub-Atlantic, New Delhi.
4. B. Govindarajalu, 1994. IBM-PC and Clones - Hardware Troubleshooting and  
: Maintenance, Tata-McGraw-Hill.
5. Rao, P.V.S. 2008 : Computer System Architecture, PHI, 1<sup>ST</sup> Edition

**Paper Code** : **BCA – 603**  
**Paper Title** : **Computer Networks**  
**Theory Marks** : **90**

**Number of Lectures : 60**  
**(45 minutes duration)**

**Objectives :** As part of this course, students will be introduced to computer networks and data communication paradigms, network models and standards, network protocols and their use and wireless technologies.

**Note :**

- i. The Question Paper will consist of Four Units.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Unit and the Compulsory question.
- iv. All questions carry equal marks unless specified.
- v. **The student can use only Non-programmable & Non-storage type of Calculator.**
- vi. **Log tables are allowed. Students may be provided the same for computation.**

**UNIT - I**

1. Introduction to Data Communication: Data Communication fundamentals, Simplex, Half-Duplex, Full-Duplex  
Network definition, Network Hardware and Software, Network Topologies, Uses of Computer Networks, OSI reference model, TCP/IP Reference Model. Comparison of OSI & TCP/IP reference model.
2. Physical Layer: Transmission Media, Switching, ISDN & its services, Multiplexing, Modems.

(No. of Periods: 15)

**UNIT - II**

3. Data Link Layer : Design Issue, Error Detection & Correction Codes, Elementary Data Link Protocols, Static & Dynamic Channel Allocation, Introduction to IEEE standards, Sliding Window Protocols: One-bit Sliding Window Protocol, Go Back n, Selective Repeat.

(No. of Periods:

15)

**UNIT - III**

4. Network Layer : Design issues, Routing Algorithms: Shortest path routing, Flooding, Flow-Based Routing, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast & Multicast routing. Congestion Control Algorithms & internetworking, Network Layer in The Internet: The IP Protocol, IP Addresses, Subnets, IPv4 and IPv6.

(No. of Periods: 15)

**UNIT - IV**

5. Application Layer : Network Security & Privacy, Data Compression & Cryptography, Electronic Mail, Remote Login, File Transfer.

**Suggested Readings :**

**Essential :**

1. Tannenbaum, A.S., 2003: Computer Networks, Prentice Hall.

**Further Reading :**

2. Stallings, William, 2008 : Local and Metropolitan Area Networks : An Introduction, Macmillian Publishing Co.
3. Black : Data Network, Prentice Hall of India.

**BCA : 604 Minor Project and Seminar**

**Paper Code : BCA – 604**  
**Paper Title : Based on BCA – 601**  
**Theory Marks : 90**

Project and Seminar must be taken up from the real life problems. Marks for these are to be given on the basis of Programming Style, User friendly I/O, on-line help and documentation (user Manual). This work will carry 100 marks, (90 Marks for Project and Seminar Viva; and 10 Marks for Internal Assessment).

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