

<b>Course Title : ENGLISH</b> <b>Course code : BCA 101</b>	
<b>Course Outline</b>	The subject aims at providing in-depth knowledge of grammar, structural English, effective writing, and understanding life through Literature. Important theories, philosophies, epistemologies and periods of Literature are brought into the cognitive compass of the learners.
<b>Course Outcome</b>	1. Creating an emotive association with the spirit of language and literature  2. Providing the learners knowledge about translation.  3. Making the students understand how commercial communication is different from Literary communication.  4. Enabling the students to have analytical understanding of literary pieces.
<b>Student Learning Outcomes</b>	1. Evaluation of different kinds of poetry and prose. 2. Understanding of grammatical constructions. 3. Understanding of Language and Literature in various perspectives. 4. Developing the students' taste for writing their own poetic and prose pieces.
<b>Course content/Syllabus</b>	As Prescribed by Panjab University  Book Prescribed: <i>Colours of Expression</i> by Harbhajan Singh published by Publication Bureau, Panjab University, Chandigarh  <b>Section A</b>  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

	<p><b>Section B</b></p> <p>1) Word formation from Prose and Stories and their use in sentences (5 out of 8) 10 marks</p> <p>2) Use of textual words and idioms in sentences (5 out of 8) 10 marks</p> <p>3) Translation from Hindi/Punjabi to English 5 marks (a small Paragraph) OR For Foreign Students (Paraphrase of Poetry Passage)</p> <p>4) Official, Business and Letters to the Editors 5 marks</p>
<b>Required Text</b>	Colours of Expression by Harbhajan Singh published by Publication Bureau, Panjab University, Chandigarh
<b>Suggested Text, readings and Materials</b>	<ol style="list-style-type: none"> <li>1. English Grammar and Composition by Wren and Martin.</li> <li>2. Colours of Expression by Harbhajan Singh</li> <li>3. Advanced English Grammar by Martin Hewings.</li> </ol>
<b>Pedagogy for Course Delivery</b>	<ol style="list-style-type: none"> <li>1. Interactive sessions</li> <li>2. Class debates and discussions</li> <li>3. Snap Tests</li> <li>4. Formation of student groups and literary contests among them.</li> </ol>
<b>Evaluation Criteria</b>	10 marks will be internal assessment based on the Mid-Semester Test, Academic Activity (Seminar, Project & Assignments) and Attendance. 65 marks will be external assessment based on performance in examinations conducted by Panjab University.

<b>Course Title: Fundamentals of Mathematical Statistics</b> <b>Course Code: BCA-16-102</b>	
Course Objective	The objective of this paper is to help the students in understanding mathematical and statistical tools in business decisions.
Course Outcomes	<p><b>On completion of this course, the students will be able to:</b></p> <p><b>CO1:</b> To develop the student's ability to deal with numerical and quantitative issues in business.</p> <p><b>CO2:</b> To enable the use of statistical, graphical and algebraic techniques wherever relevant.</p> <p><b>CO3:</b> To have a proper understanding of Statistical applications in Economics and Management.</p>
Student Learning Outcomes	<ol style="list-style-type: none"> <li>1. Describe and discuss the key terminology, concepts tools, and techniques used in business statistical analysis.</li> <li>2. Critically evaluate the underlying assumptions of analysis tools.</li> <li>3. Understand and critically discuss the issues surrounding sampling and significance.</li> <li>4. Discuss critically the uses and limitations of statistical analysis.</li> <li>5. Solve a range of problems using the techniques covered.</li> <li>6. Conduct basic statistical analysis of data.</li> </ol>
Syllabus/Course Contents	<p><b>As Prescribed by Panjab University:</b></p> <p style="text-align: center;"><b>UNIT I</b></p> <p>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.</p> <p style="text-align: center;"><b>UNIT II</b></p>

	<p>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 8 Continuous Series, Coefficient of Standard Deviation and coefficient of variation, Combined Standard Deviation, Correcting incorrect Standard Deviation</p> <p style="text-align: center;"><b>UNIT III</b></p> <p>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.</p> <p style="text-align: center;"><b>UNIT IV</b></p> <p>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.</p>
Required Texts	Business Mathematics and Statistics by T.R. Jain, V.K. Global Publications
Suggested Reading, Texts, and Materials	<ol style="list-style-type: none"> <li>1. Business Statistics by Mr. R. S. Bharadwaj, Excel Book.</li> <li>2. Business Statistics by Richard Levin.</li> <li>3. Business Statistics by Ken Black, Tata Macgraw Hill.</li> <li>4. Schaum's Series for problem practice.</li> </ol>

	<b>5. Mathematical Statistics by Ray, Sharma, and Choudhary. Business Statistics by V. K. Kapoor, S. Chand.</b>
Pedagogy for Course Delivery	Tutorials, Question Solving by Students, Digital Board Method
Evaluation Criteria	The Course-Level assessment includes continuous internal assessment having a weightage of 10 marks. These 10 Marks evaluated through mid-semester tests, presentation, classroom participation and assignments.

<b>Course Title : Computer Fundamentals and Computing Software</b> <b>Course code : BCA-16-103</b>	
<b>Course Outline</b>	One can't imagine any economy without support of IT. There is now hardly any activity which is done without support of IT. The objective of this course is to familiarize students with complete Fundamentals and the packages commonly used in computing software.
<b>Course Outcome</b>	<p>CO1: To understand the fundamental concepts of computer/information technology and its usage in the various field of business</p> <p>CO2: To enable the practical skill of basic computer operations</p> <p>CO3: To make the students able to understand the functionality of word processor, spreadsheet package</p> <p>CO4: To enable the student to develop business presentation using PowerPoint</p>
<b>Student Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Student can identify the basic parts of computer and able to decide what type of computer should be used to fulfill the business needs.</li> <li>2. Able to operate the computer and perform basic functions on computer using operating system and preinstalled Apps.</li> <li>3. Can write resume, business letter electronically and also can create basic ads or posters etc.</li> <li>4. Able to manage basic business data, perform calculation on data and graphically represent information electronically</li> <li>5. Able to create attractive business presentation to promote business</li> </ol>
<b>Course content/Syllabus</b>	<p style="text-align: center;">As prescribed by Panjab University</p> <p style="text-align: center;"><b>UNIT - I</b></p> <p><b>Computer Appreciation:</b> 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</p> <p><b>input devices:</b> Keyboard, Mouse, Trackball, Pen, Touch screens, Scanner, Digital Camera;</p> <p><b>Output devices:</b> Monitors, Printers, Plotters.</p> <p><b>Computer Memory:</b> Representation of information: BIT, BYTE, Memory, Memory size; Units of measurement of storage; Main</p>

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, autoformatting, 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.

	<p style="text-align: center;"><b>UNIT - IV</b></p> <p><b>Spreadsheet Package:</b> 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, Auto formatting cells and sheets, defining new auto format, 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.</p> <p><b>Presentation Packages:</b> Basics of creating a presentation, Parts of main window, workspace views, creating a presentation, Incorporation of Animation.</p>
<b>Required Text</b>	1. Basandra, S.K.: Computers Today, Galgotia.
<b>Suggested Text, readings and Materials</b>	<ol style="list-style-type: none"> <li>1. Sinha P.K. &amp; Sinha Priti : Computer Fundamentals, BPB Publications</li> <li>2. Mathur Rajiv, 1995: DOS 6.2 Quick Reference, Galgotia.</li> <li>3. OOoAuthors Team : Getting Started with OpenOffice.org 3.3, Friends of OpenDocument</li> <li>4. Singleton, Roderick G.: OpenOffice.org User Guide.</li> </ol>
<b>Pedagogy for Course Delivery</b>	Interactive theory sessions, assignment and projects, Seminars, class presentation by groups of students, self-study sessions.
<b>Evaluation Criteria</b>	10 marks will be internal assessment based on the Mid-Semester Test, Academic Activity (Seminar, Project & Assignments) and Attendance. 65 marks will be external assessment based on performance in examinations conducted by Panjab University.



<b>Course Title : Problem Solving Through C</b> <b>Course code : BCA-16-104</b>	
<b>Course Outline</b>	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.
<b>Course Outcome</b>	CO1: Express the logical flow used in Programming CO2: Design algorithms for solving various real life problems CO3: Implement programme in C and introducing its various concepts
<b>Student Learning Outcomes</b>	1. After completion of the course student will be able to develop the logic for the real life problem 2. Capable to design the algorithm and flow charts for the said problem. 3. Able to write the code of the C Language to solve a specific problem for which algorithm or follow chart developed
<b>Course content/Syllabus</b>	<p style="text-align: center;">As prescribed by Panjab University</p> <p style="text-align: center;"><b>UNIT - I</b></p> <p><b>Programming Process:</b> Steps in developing of a program, Data Flow Diagram, Decision Table, Algorithm development, Flowchart, Pseudo Code, Testing and Debugging.</p> <p><b>Fundamentals of C Languages:</b> 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.</p> <p><b>Operators and Expressions:</b> 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.</p> <p style="text-align: center;"><b>UNIT - II</b></p> <p><b>Decision Control Structure:</b> Decision making with IF-statement, IF-Else and Nested IFElse, The else if Clause.</p> <p><b>Loop Control Structure:</b> While and do-while, for loop and Nested for loop</p> <p><b>Case Control Structure:</b> Decision using switch, Thegoto statement.</p> <p><b>Functions:</b> 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.</p> <p style="text-align: center;"><b>UNIT - III</b></p>

	<p><b>Arrays:</b> 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.</p> <p><b>Pointers:</b> Pointer declaration, Address operator “&amp;”, Indirection operator “*”, Pointer and arrays, Pointers and 2-Dimensional Arrays, Pointer to an Array, Passing 2-D array to a Function, Array of Pointers.</p> <p><b>Dynamic Memory Allocation:</b> malloc(), calloc(), realloc(), free() functions.</p> <p style="text-align: center;"><b>UNIT - IV</b></p> <p><b>String Manipulation in C:</b> Declaring and Initializing string variables, Reading and writing strings, String Handling functions (strlen(), strcpy(), strcmp(), strcat()).</p> <p><b>Structures and Unions:</b> Declaration of structures, Structure Initialization, Accessing structure members, Arrays of structure, Nested structures, Structure with pointers, Union.</p> <p><b>Files in C:</b> Introduction, Opening and Closing files, Basic I/O operation on files.</p>
<b>Required Text</b>	1. Yashavant P. Kanetkar : Let us C, BPB Publications, New Delhi.
<b>Suggested Text, readings and Materials</b>	<ol style="list-style-type: none"> <li>1. Salaria, R.S. : Test Your Skills in C, Salaria Publications, New Delhi.</li> <li>2. C. Balaguruswami : Programming with C Language, Tata McGraw Hill, New Delhi.</li> <li>3. Byron S. Gottfried : Programming in C, McGraw Hills Publishers, New York.</li> <li>4. M.T. Somashekara : Programming in C, Prentice Hall of India</li> </ol>
<b>Pedagogy for Course Delivery</b>	Interactive theory sessions, assignment and projects, discussions, Seminars, class presentation by groups of students, self-study sessions.
<b>Evaluation Criteria</b>	10 marks will be internal assessment based on the Mid-Semester Test, Academic Activity (Seminar, Project & Assignments) and Attendance. 65 marks will be external assessment based on performance in examinations conducted by Panjab University.

<b>Course Title : Lab based on BCA-16-103</b> <b>Course code : BCA-16-105</b>	
<b>Course Outline</b>	This course will enhance the practical skill to use the windows operating system and various package like word processor, spreadsheet and presentation package, used in the daily office work.
<b>Course Outcome</b>	CO1: To perform fundamentals operations with knowledge of Windows/Dos operating system  CO2: Highlight the features of word processing, spreadsheet and presentation tools  CO3: To provide the practical skill to handle and analyse the day to day problem using spreadsheet package  CO4: To enable the student to develop business presentation using PowerPoint
<b>Student Learning Outcomes</b>	1. Student will be able to perform operations on computer using Windows/Dos Operating system 2. Able to Write and format the business document and also can create basic ads or posters etc. using the word processor package. 3. Able to manage basic business data, perform calculation on data and graphically represent information electronically  4. Able to create attractive business presentation to promote business
<b>Course content/Syllabus</b>	As prescribed by Panjab University <b>UNIT - I</b> <b>Understanding Operating System using DOS</b> : 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; <b>Internal Commands:</b> DIR, MD, CD, CLS, COPY, DATE, DEL, PATH, PROMPT, REN, RD, TIME, TYPE, VER, VOL; <b>External Commands:</b> 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. <b>Understanding Graphical User Interface using Windows:</b> Fundamentals of Windows, Types of Windows, Anatomy of windows, Icons, Recycle bin, Operations on Folders, Registry of Windows: Basics, Editing; Control panel.

## UNIT - II

**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, autoformatting, 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 - III

**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, Auto formatting cells and sheets, defining new auto format, 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.

### Required Text

1. Basandra, S.K.: Computers Today, Galgotia.

<b>Suggested Text, readings and Materials</b>	<ol style="list-style-type: none"> <li>1. Sinha P.K. &amp; Sinha Priti : Computer Fundamentals, BPB Publications</li> <li>2. Mathur Rajiv, 1995: DOS 6.2 Quick Reference, Galgotia.</li> <li>3. OOoAuthors Team : Getting Started with OpenOffice.org 3.3, Friends of OpenDocument</li> <li>4. Singleton, Roderick G.: OpenOffice.org User Guide.</li> </ol>
<b>Pedagogy for Course Delivery</b>	Interactive Lab sessions and Demonstration, Practical assignment and projects.
<b>Evaluation Criteria</b>	<p>10 marks will be internal assessment based on the Mid-Semester Test, Academic Activity (Seminar, Project &amp; Assignments) and Attendance.</p> <p>65 marks will be external assessment based on performance in examinations conducted by Panjab University.</p>

<b>Course Title : Lab Based on BCA-16-104</b> <b>Course code : BCA-16-106</b>	
<b>Course Outline</b>	The objective of this course is to enhance the skill of student using practical implementation of programming language concept and train the student to work on C Compiler. 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.
<b>Course Outcome</b>	CO1: Provide the training about the use of C Compiler for execution of the programme CO2: Implement and execute the programme in C with the use of various constructs of structured programming
<b>Student Learning Outcomes</b>	1. After completion of the course student will be able to execute the programme on C Compiler 2. Capable to Execute the programme with various types of constructs and able to test the developed programme with difference test cases.
<b>Course content/Syllabus</b>	<p style="text-align: center;">As prescribed by Panjab University</p> <p style="text-align: center;"><b>UNIT - I</b></p> <p><b>Programming Process:</b> Steps in developing of a program, Data Flow Diagram, Decision Table, Algorithm development, Flowchart, Pseudo Code, Testing and Debugging.</p> <p><b>Fundamentals of C Languages:</b> 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.</p> <p><b>Operators and Expressions:</b> 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.</p> <p style="text-align: center;"><b>UNIT - II</b></p> <p><b>Decision Control Structure:</b> Decision making with IF-statement, IF-Else and Nested IFElse, The else if Clause.</p> <p><b>Loop Control Structure:</b> While and do-while, for loop and Nested for loop</p> <p><b>Case Control Structure:</b> Decision using switch, Thegoto statement.</p> <p><b>Functions:</b> 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.</p> <p style="text-align: center;"><b>UNIT - III</b></p> <p><b>Arrays:</b> Introduction, Array declaration, Accessing values in an array, Initializing values in an array, Single and Two Dimensional Arrays,</p>

	<p>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.</p> <p><b>Pointers:</b> Pointer declaration, Address operator “&amp;”, Indirection operator “*”, Pointer and arrays, Pointers and 2-Dimensional Arrays, Pointer to an Array, Passing 2-D array to a Function, Array of Pointers.</p> <p><b>Dynamic Memory Allocation:</b> malloc(), calloc(), realloc(), free() functions.</p> <p style="text-align: center;"><b>UNIT - IV</b></p> <p><b>String Manipulation in C:</b> Declaring and Initializing string variables, Reading and writing strings, String Handling functions (strlen(), strcpy(), strcmp(), strcat()).</p> <p><b>Structures and Unions:</b> Declaration of structures, Structure Initialization, Accessing structure members, Arrays of structure, Nested structures, Structure with pointers, Union.</p> <p><b>Files in C:</b> Introduction, Opening and Closing files, Basic I/O operation on files.</p>
<b>Required Text</b>	1. Yashavant P. Kanetkar : Let us C, BPB Publications, New Delhi.
<b>Suggested Text, readings and Materials</b>	1. Salaria, R.S. : Test Your Skills in C, Salaria Publications, New Delhi.
<b>Pedagogy for Course Delivery</b>	Interactive Lab sessions and Demonstration, Practical assignment and projects.
<b>Evaluation Criteria</b>	10 marks will be internal assessment based on the Mid-Semester Test, Academic Activity (Seminar, Project & Assignments) and Attendance. 65 marks will be external assessment based on performance in examinations conducted by Panjab University.