Discipline: Science ☐ Arts, Humanities & Social Science ☐

Commerce ☐ BBA ☐ BCA ☑

Subject Name: BCA

Subject Code: _____ (Will be provided by the University)

Semester: Semester I ☑ Semester II ☐ Semester III ☐ Semester IV ☐

Semester V ☐ Semester VI ☐ Semester VII ☐ Semester VIII ☐

Course Name: Digital Electronics

Course Code: UBCAMAJ11001 (Will be provided by the University)

Course Credit: Theoretical 3 Practical/Tutorial 1

Marks Allotted: Theoretical 40 Practical/Tutorial 20

Continuing Evaluation 10 Attendance 5

Course Type (tick the correct alternatives):

Major Core ☑ AEC ☐

Interdisciplinary/ DSE ☐ SEC ☐

Minor / Generic Elective ☐ VAC ☐

Research Project/Dissertation ☐ Vocational ☐

Is the course focused on employability / entrepreneurship? YES ☑ NO ☐

Is the course focused on imparting life skill? YES ☐ NO ☑

Is the course based on Activity ? YES ☑ NO ☐

Remarks by Chairman, UG BOS, if any

The syllabus may be modified from time to time on the basis of the requirements in future.

UG BOS Meeting Reference Number: 181/UG-23 Date: 05/07/23

Prepared by CIRM

Course Code: UBCAMAJ11001

Course Name: Digital Electronics

Brief Course Description:

This paper deals with the basic concepts of Digital computers and digital logic, it gives us an overview of the internal structure and working of a digital computer and its building blocks. The logic behind the working of each component is explained in this subject.

Prerequisite(s) and/or Note(s):

(1) High school mathematics.
(2) Note(s): Syllabus changes yearly and may be modified during the term itself, depending on the circumstances. However, students will be evaluated only on the basis of topics covered in the course.

Course Objectives:

Knowledge acquired:

(1) Basic knowledge of digital logic and digital circuits,
(2) Overall idea about how computers function and the internal building blocks of a computer.
(3) Knowledge about how operations are performed in a computer
(4) A thorough understanding of the fundamental concepts and techniques used in digital electronics.

Skills gained:

(1) Application of the knowledge of digital logic to understand digital electronics circuits.
(2) The ability to understand, analyze and design various combinational and sequential circuits.
(3) To understand and examine the structure of various number systems and its application in digital design.

Competency Developed:

(1) Ability to identify basic requirements for a design application and propose a cost effective solution.
(2) The ability to identify and prevent various hazards and timing problems in a digital design.
(3) Ability and skill to develop/build, and troubleshoot digital circuits.

Course Syllabus Overview:

UBCAMAJ11001: Digital Electronics   [Credits: 3, Lectures: 45]

Unit 1: Number system and codes (5 Lectures)
Binary, octal, hexadecimal and decimal number systems and their inter conversion, BCD numbers (8421-2421), Gray code, excess–3 code, code conversion, ASCII, EBCDIC codes, their advantages and disadvantage, Binary addition and subtraction, Negative number representation: Sign magnitude, 1's, 2's Complement. signed and unsigned binary numbers, Fixed and floating-point representation.

Unit 2: Basic logic circuits (5 Lectures)
Logic gates (AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR and their truth tables,), Universal Gates, Laws of Boolean algebra, De-Morgan's theorem, Min term, Max term, POS, SOP, K-Map for 2, 3, 4 variables, Simplification by Boolean theorems, don't care condition, Venn diagram. SSI, MSI, LSI and VLSI circuits.

Unit 3: Logic Families (5 Lectures)
Introduction to digital logic family such as RTL, DTL, TTL, ECL, CMOS, IIR, HTL etc., their comparative study, Basic circuit, performance characteristics.

Unit 4: Combinational Logic (5 Lectures)
Half adder, Full adder, parallel adder, half subtractor, full subtractor, 4-bit binary adder cum subtractor. Multiplexer, Demultiplexer, Decoder, BCD to seven segment Decoder, Encoders.

Unit 5: Sequential Circuit: (10 Lectures)
Set-reset latches, D-flip-flop, R-S flip-flop, J-K flip-flop, Master slave flip-flop, edge triggered flip-flop, T flip-flop, Synchronous/Asynchronous counter, Up/down synchronous counter, Ripple Counter, Applications of counter, Serial in/Serial out shift register, Parallel in/Serial out shift register, Serial in/parallel out shift register, parallel in/ parallel out shift register, Bi-directional register, Applications of register.

Suggested Readings

- "Digital Logic and Computer Design", M. Morris Mano, Pearson Publication
- "An Introduction to Digital Computer Design", Rajaraman V. & Radhakrishnan, PHI.
- "Digital Principles & Applications", Malvino & Leach, TMH
- "Digital Circuits and Design", S. Salivahanan, S. Arivazhagan, Oxford University Press

UBCAMAJ11001L: Digital Electronics Lab   [Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. General study of Basic & Universal gates

   a) AND   b) OR   c) NOT   d) NOR
   e) NAND   f) XOR   g) XNOR

2. Simple Boolean Expression using Basic gates and Universal gates:

   $\overline{A} . (B+A) + B.\overline{A}$
   $XZ + X' Y Z$
   $A + B [AC + (B + C') D]$

3. Design Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor Circuit.
4. Parallel Adder (2-bit, 3-bit) Circuit.
5. Implement logic functions in SOP form using Multiplexer.
6. Implement De-multiplexer.
7. Implement 7- Segment Display with Decoder.
8. Implement Parity Generator (Odd & Even)
9. Implement Magnitude Comparator (1-bit, 2-bit, 3-bit)
10. Circuit design and implementation of Decoder (2x4)
11. Circuit design and implementation of Encoder (4x2)
12. Circuit design and implementation of an expression using decoders.

Discipline: Science ☐   Arts, Humanities & Social Science ☐

Commerce ☐   BBA ☐   BCA ☑

Subject Name: BCA

Subject Code: _____ (Will be provided by the University)

Semester: Semester I ☑   Semester II ☐   Semester III ☐   Semester IV ☐

Semester V ☐   Semester VI ☐   Semester VII ☐   Semester VIII ☐

Course Name: System Tools & Peripheral and Office Automation

Course Code: UBCASEC11001 (Will be provided by the University)

Course Credit: Theoretical 2   Practical/Tutorial 1

Marks Allotted: Theoretical 40   Practical/Tutorial 20

Continuing Evaluation 10   Attendance 5

Course Type (tick the correct alternatives):

Major Core	☐	AEC	☐
Interdisciplinary/ DSE	☐	SEC	☑
Minor / Generic Elective	☐	VAC	☐
Research Project/Dissertation	☐	Vocational	☐

Is the course focused on employability / entrepreneurship?   YES ☑   NO ☐

Is the course focused on imparting life skill?   YES ☑   NO ☐

Is the course based on Activity ?   YES ☑   NO ☐

Remarks by Chairman, UG BOS, if any

The syllabus may be modified from time to time on the basis of the requirements in future.

UG BOS Meeting Reference Number: 181/UG-23   **Date:** 05/07/2023

Course Code: UBCASEC11001

Course Name: System Tools & Peripheral and Office Automation

Brief Course Description:

The course on "System Tools & Peripheral and Office Automation" is designed to provide students with a comprehensive understanding of essential system tools, peripheral devices, and office automation technologies. This course aims to equip students with the knowledge and skills required to efficiently utilize system tools, manage peripheral devices, and streamline office operations using automation.

<u>Prerequisite(s) and/or Note(s)</u>:

(1) Basic knowledge of Computer
(2) Note(s): Syllabus changes yearly and may be modified during the term itself, depending on the circumstances. However, students will be evaluated only on the basis of topics covered in the course.

Course Objectives:

- Introduce students to the fundamental concepts of system tools, their functionalities, and their role in computer systems.
- Familiarize students with various peripheral devices commonly used in computer systems and their functionalities.
- Develop students' proficiency in utilizing system tools to optimize computer performance, troubleshoot issues, and maintain system integrity.
- Enable students to effectively manage peripheral devices, including printers, scanners, external storage devices, and input/output devices.
- Explore the concept of office automation and its significance in modern workplaces.
- Introduce students to popular office automation tools and software, such as document management systems, collaboration platforms, and workflow automation tools.
- Enhance students' skills in utilizing office automation tools to streamline routine office tasks, improve productivity, and enhance communication and collaboration within organizations.

Skills gained:

- The course assessment will be conducted through a combination of assignments, quizzes, practical exercises, tests and a final examination. The assignments and quizzes will assess students' understanding of the theoretical concepts, while practical exercises will evaluate their proficiency in utilizing system tools, managing peripheral devices, and implementing office automation solutions.

Competency Developed:

- The course on "System Tools & Peripheral and Office Automation" aims to equip students with the knowledge and skills required to effectively utilize system tools, manage peripheral devices, and implement office automation solutions. By completing this course, students will be well-prepared to contribute to the efficient operation of computer systems and optimize office processes using automation technologies.

UBCASEC11001: System Tools & Peripheral and Office Automation   [Credits: 2, Lectures: 30]

UNIT 1 Introduction to Computers (7 Lectures)

Introduction, Definition, Characteristics of computer, Generations of Computer, Classification of Computers, Block diagram of a computer, types of Software-System and Application, Operating System, CUI vs GUI. Computer language-evolution, language classification-low level and high level language, assembly language, interpreters, compilers, assemblers.

UNIT 2 Peripheral devices (7 Lectures)

Input and Output Devices – Punched Card, Keyboard, Mouse, Joystick, Trackball, Light Pen, Touch Screen, Magnetic Ink Character Recognition (MICR), Optical Character Recognition (OCR), Optical Mark Recognition (OMR), Display units, Printers- Impact and Non-Impact. Primary storage – RAM-SRAM, DRAM, ROM-PROM, EPROM, EEPROM, Secondary storage – Hard drive, Magnetic drive, Compact Disk, Cache memory, components of motherboard.

Unit 3 Introduction to Office Automation Tools and Software (4 Lectures)

Understanding the concept of office automation, Benefits and challenges of implementing office automation, Role of office automation in enhancing productivity and efficiency, Document management systems: organizing, file sharing, Ensuring data security and privacy and communication tools

UNIT 4 Working with MS OFFICE (4 Lectures)

Introduction to Word, Word layout, Creating, Editing, Saving and printing text documents, Text formatting, Working with tables, Using lists and styles, Working with Images, Clip Art, Chart, Shapes, Word Art and Symbols, Using Spelling and Grammar check, Mail merge

UNIT 5 Working with MS Excel (4 Lectures)

Introduction to Excel, Formatting excel work book, Perform Calculations with Functions, Sort and Filter Data with Excel, Create Effective Charts to Present Data Visually

UNIT 6 Working with MS Power Point (4 Lectures)

Introduction to Power point, Creating slides and applying themes, Working with bullets and numbering, Working with Animation and Slide Transition, Working with different views, Working with slide Master, Slide show option

Suggested Reading:

1. Nabin Kumar Samanta(2007) , An overview of Information Technology and its application in Bussiness, New Central Book Agency (P) Ltd.Kolkata

2. V.Rajaraman(PHI,1996), Fundamental of Computers (2nd Edition)

3. S.Jaiswal (Galgotia), Fundamentals of Information Technology for BCA.

4. Peter Norton's (2000), Introduction to Computers,Tata McGraw Hill.

5 Ashok Arora (2022), Introductions to Computer Application, Vikas Publishing

UBCASEC11001L: System Tools & Peripheral and Office Automation Lab   [Credit:1, Lab Hours:30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

Ms Word practical

- Create a document and perform formatting/font operations.
- Write steps to perform cut, copy and paste commands.
- Demonstrate the bullets and numbering
- Write steps and perform following task:¬Find and replace¬Go to¬Spelling& grammer check¬Hyperlink¬Bookmark¬Header & footer¬Watermark¬Page color¬Page border¬Endnote & footnote
- Write steps to create a table of 10-15 students using columns: sl.no, stu_name, roll no, contact number
- Write steps to insert images/pictures
- Demonstrate Mail Merge in Ms Word
- Demonstrate Macro in Ms Word
- Draw the flowchart using drawing tools in your word processing.
- Create the following form in Ms Word
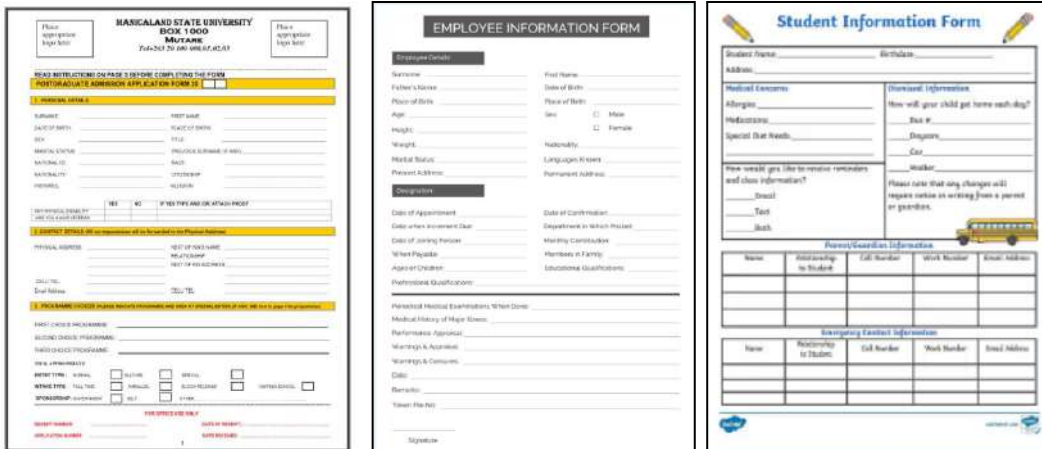
- Design advertisement using Ms Word
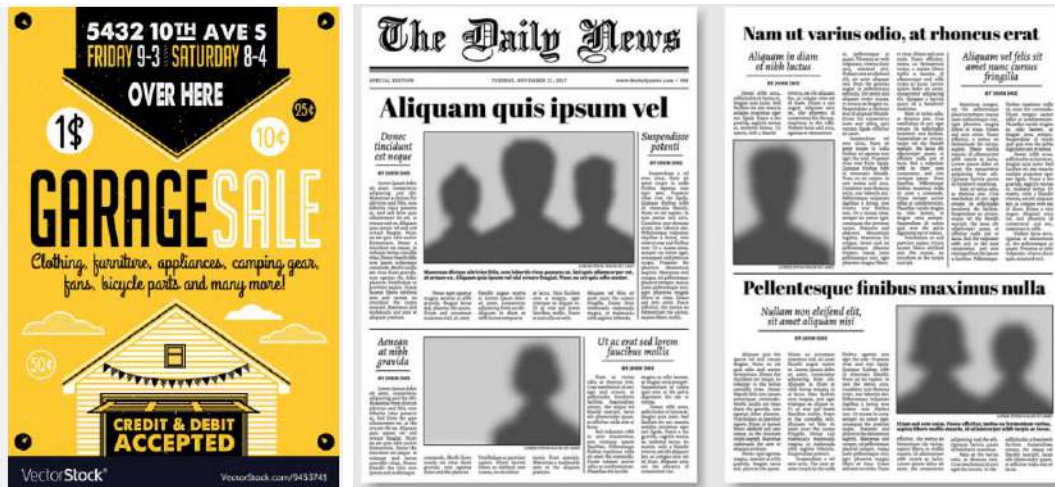
Ms Excel practical

- Create a workbook and enter the raw data applying as many presentation Features (Font, Font Size, Font Colour, Number Formats and Colour, Cell Shading, Text Rotation, etc)
- Apply appropriate number formats to your numbers.
- Select the best page orientation for your spreadsheet.
- Adjust the column width and row height to suit the layout you have selected.
- Create formula's to calculate the percentage of the total number of people
- Setup an appropriate title, header, footer and page number in your spreadsheet.
- Create the following Table in Excel with given details :-
    RollNo, Name, Math, English, Science, Total Result, Division
- Create a Column chart, bar chart, pie chart
- Demonstrate following : -
    Formulas Sum, Average, If, Count, Counta, Countif & Sumif

Roll No	Student Name	Hindi	English	Math	Physics	Chemistry	Total	Average	Grade
1	RAM	20	10	14	18	15	77	15.4	A
2	ASHOK	21	12	14	12	18	?	?	?
3	MANOJ	33	15	7	14	17	?	?	?
4	RAJESH	15	14	8	16	20	?	?	?
5	RANJANA	14	17	10	13	18	?	?	?
6	POOJA	16	8	20	17	15	?	?	?
7	MAHESH	18	19	3	10	14	?	?	?
8	ASHUTOSH	19	20	7	14	18	?	?	?
9	ANIL	22	13	8	12	19	?	?	?
10	PREM	26	12	10	11	27	?	?	?

Q.1 Find the Total Number & Average in all Subjects in Each Student .
Q.2 Find Grade Using If Function - If Average Greater >15 then "A" Grade otherwise "B" Grade
Q.3 How Many Student "A" and "B" Grade   Use of Countif
Q.4 Student Ashok and Manoj Total Number and Average   Use of Sumif
Q.5 Count how many Students   Use of Counta
Q.6 How Many Student Hindi & English Subject Number Grater Then > 20 and <15   Use of Countif
- Demonstrate different formulas available in Ms Excel.

Ms Power Point practical

- Creating a Title Slide
- Creating Slides Using Layouts
- Create a presentation that consists of 5 slides and save your Presentation in desktop.
- Demonstrate slide transitions and animation
- Insert slide number, slide date, slide header and footer
- Demonstrate rehearse time.
- Demonstrate master slide.

Suggested Readings:

1. Dinesh Maidasani , Learning Computer fundamentals MS office and Internet & Web Technology, Laxmi Publications; Third edition (1 January 2016).

2. Saravanan, Computer Fundamentals with Ms Office Applications, Scitech Pub. (1 January 2008)

3. Jain Anupama and Navneet Mehra, Computer Fundamental MS Office, Vitasta Publishing Pvt.Ltd

4. Harish Gujjar, Fundamentals of Computers And Ms-Office, S S Bhavikatti Prakashana (1 January 2015)

Discipline: Science ☐ Arts, Humanities & Social Science ☐

Commerce ☐ BBA ☐ BCA ☑

Subject Name: BCA

Subject Code: [   ] (Will be provided by the University)

Semester: Semester I ☐ Semester II ☑ Semester III ☐ Semester IV ☐

Semester V ☐ Semester VI ☐ Semester VII ☐ Semester VIII ☐

Course Name: Discrete Mathematics

Course Code: UBCAMAJ12002 (Will be provided by the University)

Course Credit: Theoretical [3] Practical/Tutorial [1]

Marks Allotted: Theoretical [60] Practical/Tutorial [0]

Continuing Evaluation [10] Attendance [05]

Course Type (tick the correct alternatives):

Major Core ☑ AEC ☐

Interdisciplinary/ DSE ☐ SEC ☐

Minor / Generic Elective ☐ VAC ☐

Research Project/Dissertation ☐ Vocational ☐

Is the course focused on employability / entrepreneurship? YES ☑ NO ☐

Is the course focused on imparting life skill? YES ☑ NO ☐

Is the course based on Activity ? YES ☐ NO ☑

Remarks by Chairman, UG BOS, if any

The syllabus may be modified from time to time on the basis of the requirements in future.

UG BOS Meeting Reference Number: 181/UG-23 Date: 05/07/23

Course Code: UBCAMAJ12002

Course Name: Discrete Mathematics

Brief Course Description:

This paper deals with the basic idea about discrete mathematics and discrete structures, about mathematical notations and their use.

Prerequisite(s) and/or Note(s):

(1) High school mathematics.
(2) Note(s): Syllabus changes yearly and may be modified during the term itself, depending on the circumstances. However, students will be evaluated only on the basis of topics covered in the course.

Course Objectives:

Knowledge acquired:

(1) Basic knowledge of discrete mathematics and discrete structures,
(2) To develop understanding of Logic sets and functions
(3) Knowledge of mathematically correct terminology and notations.
(4) Knowledge about construction of direct and indirect proofs..

Skills gained:

(1) Development of problem-solving skills necessary for understanding counting problems.
(2) Ability to generalize from a single instance of a problem an entire class of problems and identification of patterns of data.

Competency Developed:

(1) Ability to analyze problems and solve problems.
(2) Ability to implement mathematical knowledge in data analysis.

Course Syllabus Overview:

UBCAMAJ12002: Discrete Mathematics	**[Credits: 4, Lectures:60]**

Unit 1: Set Theory (12 Lectures)
Introduction, Set properties, Venn diagram, subsets, Combination of Sets; union, intersection,   difference of sets, set complements, disjoint sets, power set, Multi-sets, Ordered Pairs, Cartesian Products, Set Identities

Unit 2: Relations and Functions (10 Lectures)
Introduction, Binary Relations, Operations on Relation, Domain and Range of Relation, Properties of Relations; Equivalence Relations, Equivalence classes, Partition of Set, Representation of Relation, Composite relations, Order of relations, Classification of Functions, Floor and Ceiling Functions, Operations on Functions

Unit 3: Natural Numbers (8 Lectures)
Mathematical induction, proof format, Fibonacci identity, Binomial distribution, variants of induction; strong induction

Unit 4: Propositional Logic (12 Lectures)
Introduction, Sentences, Statements, Well formed formula, truth table, complete truth tables, tautology, Logical equivalence, Theory of inference; formula representation, Rules of inference, Rules of conditional proof, Rules of indirect proof

Unit 5: Recurrence Relations (10 Lectures)
Linear Recurrences, Non-homogeneous Recurrences, Growth of functions, Big-O notation, Big – Ώ notation, Big-Ɵ notation, properties of asymptotic orders

Unit 6: Combinatorics (8 Lectures)
Permutations, permutations with repetitions, circular permutations, Combination, combination with repetitions, Principal of Inclusion-Exclusion, Pigeonhole Principle.

Suggested Readings:

1. YN Singh (2010), ***Discrete Mathematical Structures*** –Wiley.

*2. Pal and Das(2010)***, BCA MATHEMATICS VOLUME-I** – U. N. Dhur & Sons Pvt. Ltd. (2nd edition)

3. *Liu and Mohapatra(2008)* ,***Elements of Discrete Mathematics*** – McGraw Hill Education

4. *Liu and Mohapatra* (2017), **Elements of Discrete Mathematics: A Computer Oriented Approach**, McGraw Hill Education; 4th edition

UBCAMAJ12002T: Discrete Mathematics Tutorial **[Credits: 1, Lecture Hours: 15]**

Discrete mathematics tutorials as assigned and advised by teacher (s)

Discipline: Science ☐   Arts, Humanities & Social Science ☐

Commerce ☐   BBA ☐   BCA ☑

Subject Name: BCA

Subject Code: ☐ (Will be provided by the University)

Semester: Semester I ☐ Semester II ☑ Semester III ☐ Semester IV ☐

Semester V ☐ Semester VI ☐ Semester VII ☐ Semester VIII ☐

Course Name: Programming in C

Course Code: UBCASEC12002 (Will be provided by the University)

Course Credit: Theoretical 2   Practical/Tutorial 1

Marks Allotted: Theoretical 40   Practical/Tutorial 20

Continuing Evaluation 10   Attendance 5

Course Type (tick the correct alternatives):

Major Core ☐   AEC ☐

Interdisciplinary/ DSE ☐   SEC ☑

Minor / Generic Elective ☐   VAC ☐

Research Project/Dissertation ☐   Vocational ☐

Is the course focused on employability / entrepreneurship? YES ☑ NO ☐

Is the course focused on imparting life skill? YES ☑ NO ☐

Is the course based on Activity ? YES ☐ NO ☑

Remarks by Chairman, UG BOS, if any

The syllabus may be modified from time to time on the basis of the requirements in future.

UG BOS Meeting Reference Number: 181/UG-23   Date: 05/07/23

Prepared by CIRM

Course Code: UBCASEC12002

Course Name: Programming in C

Brief Course Description:

This course deals with basic programming skills and techniques. It deals with a fundamental programming language called C, its syntax and its various constructs.

Prerequisite(s) and/or Note(s):

(1) High school mathematics.
(2) Note(s): Syllabus changes yearly and may be modified during the term itself, depending on the circumstances. However, students will be evaluated only on the basis of topics covered in the course.

Course Objectives:

Knowledge acquired:

(1) idea about how computers work

(2) Knowledge about program development and implementation

(3) Syntax of C programming language

(4) Knowledge about how humans interact with computers through a language.

Skills gained:

(1) Problem solving skills

(2) Logical thinking to approach a problem

(3) Building programs for different problems at hand.

Competency Developed:

(1) Applying the skills learnt to model real world problems
(2) Facility in solving real life problems by thinking logically and outside of box.
(3) Ease of switching to any other programming language

Course Syllabus Overview:

UBCASEC12002: Programming in C	[Credits: 2, Lectures: 30]

Unit 1: Introduction to C (5 Lectures)
Overview of Procedural Programming, using main function, structure of a C program, Compiling and Executing Simple Programs in C, use of #include, #define.

Unit 2: Data Types, Variables, Constants, Operators and Basic I/O (4 Lectures)
Declaring, Defining and Initializing Variables, Scope and extent of Variables, Using Named Constants, Keywords, DataTypes, Casting of Data Types, Operators (Arithmetic, Logical, Relational, Increment/Decrement, Conditional, Bitwise, and special operators), Using Comments in programs, Formatted and Console I/O, storage classes; auto, extern, register.

Unit 3: Expressions, Conditional Statements, and Iterative Statements (7 Lectures)
Understanding Operator Precedence and associativity in Expressions, Conditional Statements (if construct, switch-case construct), Understanding syntax and utility of Iterative Statements (while, do-while, and for loops), Use of break and continue in Loops, UsingNested Statements (Conditional as well as Iterative)

Unit 4: Understanding Functions (5 Lectures)
Utility of functions, Types of Functions, Functions returning value, Void functions, Inline Functions, Return type of functions, Parameters of functions; (formal and actual), Declaration and Definition of Functions, Command Line Arguments, Parameters in Functions, Functions with variable number of Arguments, Call by Value, Call by Reference,

Unit 5: Implementation of Arrays and Strings (5 Lectures)
Creating and Using One Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, accessing individual elements in an Array, manipulating array elements using loops), Types of arrays (integer, float and character arrays / Strings), Two-dimensional Arrays (Declaring, Defining and Initializing Two-Dimensional Array, Working with Rows and Columns), Introduction to Multi-dimensional arrays

Unit 6: User-defined Data Types (Structures and Unions) (2 Lectures)
Understanding utility of structures and unions, Declaring, initializing, and using simple structures and unions, manipulating individual members of structures and unions, Array of Structures, Individual data members as structures, Passing and returning structures from functions, Structure with union as members, Union with structures as members.

Unit 7: File I/O (2 Lectures)
Opening and closing a file, Reading and writing Text Files, Using put(), get(), read() and write() functions,Random access in files,

Suggested Readings

- "The C Programming Language ANSI C Version", Kernighan & Ritchie, Prentice Hall SoftwareSeries
- "ANSI C - Made Easy", Herbert Schildt, Osborne McGraw-Hill
- "Learning to Program in C", N. Kantaris, Babani
- "C - The Complete Reference", Herbert Schildt, Osborne McGraw-Hill
- "Programming in C", Reema Thareja, Oxford University Press
- "A First Course in Programming With C", T. Jeyapoovan, Vikas Publishing House
- "Let Us C", Yashavant P. Kanetkar, BPB Publications

UBCASEC12002L: Programming in C Lab   [Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. WAP to perform input/output of all basic data types.
2. WAP to enter two numbers and find their sum.
3. WAP to reverse a number.
4. WAP to Swap Two Numbers (using and without using a third variable).
5. WAP to check whether a number is even or odd
6. WAP to compute the factors of a given number.
7. WAP to enter marks of five subjects and calculate total, average and percentage.
8. WAP to print the sum and product of digits of an integer.
9. WAP to check whether a character is vowel or consonant
10. WAP to find the largest among three numbers
11. WAP to compute the sum of the first 'n' terms of the following series
    S =1-2+3-4+5…………….n
12. WAP to compute the sum of the first 'n' terms of the following series
    S = 1+1/2+1/3+1/4+……n
13. WAP to print a triangle of stars as follows (take number of lines from user):

```
*                 *      * * * * *   * * * * *        *         * * * * *
* *             * *      * * * *     * * * *        * *          * * * *
* * *         * * *      * * *         * * *      * * *           * * *
* * * *     * * * *      * *             * *    * * * *            * *
* * * * *   * * * * *    *                 *   * * * * *            *


1           5           1             5     1                  1
1 2         4 5         2 2           4 4   2 3               1 2 1
1 2 3       3 4 5       3 3 3       3 3 3   4 5 6            1 2 3 2 1
1 2 3 4     2 3 4 5     4 4 4 4   2 2 2 2   7 8 9 10       1 2 3 4 3 2 1
1 2 3 4 5   1 2 3 4 5   5 5 5 5 5 1 1 1 1 1 11 12 13 14  1 2 3 4 5 4 3 2 1


A                 E     P Q R S T   P P  P P  P
A B             D E     Q R S T     Q Q Q Q
A B C         C D E     R S T         R R R
A B C D     B C D E     S T             S S
A B C D E   A B C D E   T               T
```

14. WAP to find the factors of a number.
15. WAP to display the Fibonacci series.
16. WAP to find the factorial of a number.
17. WAP to check if a number is prime or not.
18. WAP to check if a number is Armstrong or not.
19. WAP to check if a number is Perfect or not.
20. WAP to print all the prime numbers within a given range.

21. WAP to print all the Armstrong numbers within a given range.
22. WAP to create and display an array.
23. WAP to perform following actions on an array entered by the user:
    a) Print the even-valued elements
    b) Print the odd-valued elements
    c) Calculate and print the sum and average of the elements of array
    d) Print the maximum and minimum element of array
    e) Remove the duplicates from the array
    f) Print the array in reverse order
24. WAP for addition of two matrices.
25. WAP to find the sum of the diagonals of a matrix.
26. WAP to check if a matrix is symmetric or not.
27. WAP for matrix multiplication.
28. WAP which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
29. WAP to find the length of a string.
30. WAP to concatenate two strings entered by the user.
31. WAP to find if a character is present in a string or not.
32. WAP to reverse a string.
33. WAP to check if a string is palindrome or not.
34. WAP to convert all lowercase characters to uppercase
35. WAP to convert all uppercase characters to lowercase
36. WAP to calculate number of vowels in a string.
37. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.
38. Write a program to retrieve the student information from file created in previous question and print it infollowing format:
    Roll No.   Name   Marks

39. WAP to copy the contents of one text file to another file, after removing all whitespaces.
40. WAP to Write a Sentence to a File.
41. WAP to Read a Line From a File and Display it.