Course Title: **C Programming (4 Cr.)**
Course Code: **CACS151**
Year/Semester: **I/II**
Class Load: **8 Hrs. / Week (Theory: 4 Hrs, Tutorial: 1 Hr., Practical: 3 Hrs)**

Course Description

This course includes both theoretical as well as practical concept of programming. Practical skill of programming are provided using C language which includes basic concept of C, operators and expressions, basic input/output function, control structures, array & string, function, pointer, structure and union, file handling and graphics in C.

Course Objectives

The general objectives of this course are to provide fundamental concepts of programming language, programming technique and program development using C programming language.

Course Contents

Unit 1 Programming Language   10 Hrs.

Introduction to Programming Language, Types of Programming Language, Language Processor, Program Errors, Features of Good Program, Different Programming Paradigm, Software Development Model, Program Development Life Cycle, System Design Tools.

Unit 2 Programming Technique   5 Hrs.

Introduction to Programming Technique, Top down & Bottom up Approach, Cohesion and Coupling, Structured Programming, Deterministic and Non-deterministic Technique, Iterative and Recursive Logic, Modular Designing & Programming.

Unit 3 Basic Concept of C   5 Hrs.

Introduction, History, Features, Advantages and Disadvantages, Structure of C program, Compiling Process, C Preprocessor and Header Files, Library Function, Character Set, Comments, Tokens and its types, Data types, Escape Sequences, Preprocessors Directives.

Unit 4 Operators and Expressions   3 Hrs.

Arithmetic Operator, Relational Operator, Logical Operator, Assignment Operator, Increment/decrement Operator, Conditional Operator, Bitwise Operator, Comma Operator, Sizeof Operator, Operator Precedence and Associativity, Expressions and its Evaluation, Type Casting in Expression, Program Statement.

Unit 5 Input and Output
3 Hrs.

Input/Output Operation, Formatted I/O (scanf, printf), Unformatted I/O (getch-putch, getche, getchar-putchar and gets-puts)

Unit 6 Control Structure
6 Hrs.

Introduction, Type of Control Structure (Branching:if, if else, if elseif and switch case, Looping: while, do while and for and Jumping: goto, break and continue), Nested Control Structure.

Unit 7 Array
6 Hrs.

Introduction, Declaration, Initialization, One Dimensional Array, Multi Dimensional Array, Sorting (Bubble, Selection), Searching Sequential), String Handling.

Unit 8 User Defined Function
5 Hrs.

Introduction, Components, Function Parameters, Library Function vs. Users Defined Function, Different Forms of Function, Recursion, Passing Array to Function, Passing String to Function, Accessing a function (Call By Value & Call By Reference), Macros, Storage Class.

Unit 9 Pointer
6 Hrs.

Introduction, The Address(&) and Indirection(*) Operators, Declaration & Initialization, Pointer to Pointer, Pointer Expressions, Pointer Arithmetic. Passing Pointer to a Function, Pointer and Array, Array of Pointer, Pointer and String, Dynamic Memory Allocation.

Unit 10 Structure
5 Hrs.

Introduction, Declaration, Initialization, Nested Structure, Array of structure, Array within Structure, Passing Structure & Array of Structure to function, Structure & Pointer, Bit Fields, Union and Its Importance, Structure vs. Union.

Unit 11 Data File Handling
4 Hrs.

Introduction, Types of File, Opening & Closing Data File, Read & Write Function, Writing & Reading Data To and From Data File, Updating Data File, Random Accessing Files, Printing a File.

Unit 12 Introduction to Graphics
2 Hrs.

Initialization, Graphical Mode, Graphical Functions.

Laboratory Works

Laboratory works should be done covering all the topics listed above and a small project work should be carried out using the concept learnt in this course only. Project should be assigned on individual basis.

Teaching Methods

The general teaching pedagogy includes class lectures, group discussions, case studies, guest lectures, research work, project work, assignments (theoretical and practical), and examinations (written and verbal), depending upon the nature of the topics. The teaching faculty will determine the choice of teaching pedagogy as per the need of the topics.

Evaluation

Examination Scheme				
Internal Assessment		External Assessment		
Theory	Practical	Theory	Practical	Total
20	20 (3 Hrs.)	60 (3 hrs.)	-	100

Text Books

1. Brain W. Kerighan & Dennis Ritchie, *"The C Programming Language"*, Second Edition, Prentice Hall, 1988, ISBN: 978-0131103627
2. Byrons S. Gotterfried, *"Programming with C, 3/e "*, McGraw Hill Education India, 2013, ISBN: 978-0-07-014590-0

Reference Books

3. Al Kelley, Ira Pohl, *"A Book on C"*, 4th Edition, Pearson Education, 1998, ISBN: 978-0201183993
4. Deitel & Deitel, *"C: How to program"*, 7th Edition, Pearson Education, 2012, ISBN: 9780273776840
5. E Balagurusamy, *"Programming in ANSI C, Sixth Edition"*, Tata Mc GrawHill, 2012 ISBN: 9781259004612
6. Yeshvant Kanetkar, *"Let us C"*, 13th Edition, BPB Publication,2013, ISBN: 978-81-8333-163-0
7. Ramesh Rimal & et. al., *"Computer Science-II, Revised Edition"*, Buddha Academic Publishers and Distributors Pvt. Ltd. Nepal, 2013