Institute of Business & Information Technology
University of the Punjab
Quaid-e-Azam Campus, Lahore

Spring Term

Basic Information:

Title:	Programming Fundamental	**Code**	IT 161
Program:	BBIT	**Credit Hours:**	Theory (03)+Lab (01)
Sessions:	30 Classes + Mid Term + Final Term	**Pre-Requisite:**	IT 160

Course Description:

Programming is an increasingly important skill, whether you aspire to a career in software development, or in other fields. This course is the first in Programming, extend to any language you might want to learn. This course is designed for students with no prior programming experience. This course is for learners who have an interest in learning how to program, for people with no programming experience or for people with some experience who would like to gain solid fundamentals and a deeper understanding of how to program effectively.

The course introduces the fundamental concepts of structured programming. Topics include software development methodology, data types, control structures, functions, arrays, and the mechanics of running, testing, and debugging.

Learning Outcomes:

After the completion of this course, it is expected that students who will involve themselves in the knowledge base working of the course will be capable to

1. *Enabling Knowledge: The process of designing algorithmic solutions to computable problems; the syntax and control structures of a programming language i.e. C/C++, which enable you to code these algorithmic solutions using standard coding conventions*
2. *Critical Thinking and Analysis: Ability to analyze the requirements for solving simple algorithmic problems and implanting it in C/C++*
3. *Problem Solving: Ability to design and implement programs to solve simple algorithmic computing problems, based on analysis of the requirements.*
4. *Communication: Ability to explain key concepts of algorithmic design.*
5. *Responsibility: Ability to apply relevant standards and ethical considerations to writing computer programs. Developing an awareness of the role and responsibility, the individual has in this regard.*

Teaching Learning Methodology:

The formal teaching component of this course consists of active student participation in and contribution to all forms of teaching and learning i.e. lectures, discussions, research assignments and projects. Lectures will be twice a week of 90 min each.

Weekly Term Plan

Week	Topic
01.	*Introduction to Programing, IDE and First C Program*
02.	*Data Types and Variables*
03.	*Arithmetic Operators and Using expressions*
04.	*Logical Operators and Conditional Statements*
05.	*Loop Structure and Types*
06.	*Nested IF and Switch Statement*
07.	*Header Files and Built in Functions and User Defined Functions*
08.	*Introduction to Arrays, Linear and Multidimensional Arrays*
09.	*Mid Term Examination*
10.	*Array Manipulation and Character Arrays*
11.	*Reference and Pointers*
12.	*Relationship between pointers and arrays*
13.	*String handling*
14.	*Function-Parameter by Value and Reference*
15.	*Structures and Array of Objects*
16.	*Dynamic Memory Allocation and Deallocation*
17.	*File handling, Sequential and Random-Access Files*
18.	*Final Term Examination*

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Topics in Detail

Introduction

Program and it Sequential Execution
Common Life Example of Program
Software and Programs

Introduction to IDE

First C program
Compilation and Linking
Primitive Data Types
Variables with Data Types and their Ranges

Input and Output

Input/output Functions and Streams
Formatting the Output and Escape Sequence
Using expressions
Arithmetic Expressions
Scope of Variables
Programs of Area & Perimeter Computation, Quadratic Formula

Control Structures Selection

Logical Operators
Simple Conditional Statements; IF .... Then.... Else
Compound Conditional Statements
Truth Table Implementation
Nested IFs and Switch statement
Short Circuiting

Control Structures Repetitive

Repetition Structure (Loops)
For Loop, While Do and Do While Loops
Nested Loops
Nested Control Structures (Selective & Repetitive)

Modular Approach

Reusability through Functions
Built-in Functions and Header Files
Commonly Used Built-in Function
User Defined Functions
Parameter Passing by Value
Return Statement

Arrays

Introduction to Arrays
Linear Array manipulation
Multidimensional Arrays
Preprocessors and Macros

Recursion

Recursive Function
Mathematica Model and Examples
Recursive vs. Iterative Programs
Head and Tail Recursion

Pointers

Reference to Variables
Introduction to Pointers
Relationship between pointers and arrays
Multidimensional Arrays
Passing Values by Reference
Passing Arrays to Functions

String handling

Char Arrays
String Input and Output
String Comparison
Substring Finding

Simple User-Defined Data Types

Struct and its Usage
Array of Records
Dynamic Memory Allocation
Pointers to Records
Linear Linked List of Records
Deallocation of Memory

File handling

Sequential and Random-Access Files
Creating and Deleting Files
File Modes
Reading and Writing into Files

Text Book and Recommended Readings

1. Problem Solving with C++,
   Walter Savitch,
   7th Edition, Addison-Wesley
   ISBN 0321531345.
2. The C Programming Language
   Kernighan and Ritchie
   2nd Edition Prentice Hall

Tools

1. Visio 4.5 Technical
2. Microsoft Word for Documentation

Headings	Arial 11pt Bold
Normal Text	Times New Roman 10pt
Header Footer	Times New Roman 8pt
Paragraph	Single Line Spacing First Line Indent 1.0 cm
Page Margins	2 cm from each side

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Grading Policy:

Final Grade for this course will be the cumulated result of the following term work with relevant participation according to the quoted percentage.

Sessional	**25%**	***Mid Term***	**35%**	***Final Term***	**40%**
Assignments	10 %	*Mid Term Exam*	25%	*Final Exam*	30%
Quizzes	10%	*Major Report/Work*	10%	*Case Study/ Project/ Term Paper*	10%
Presentations	05%				

Remember subdivision of Mid Term and Final Term Examination should be done only in extreme cases of very essential and major Grading Instruments.

Dishonest Practices & Plagiarism

Any student found responsible for dishonest practice/cheating (e.g. copying the work of others, use of unauthorized material in Grading Instruments) in relation to any piece of Grading Instrument will face penalties like deduction of marks, grade 'F' in the course, or in extreme cases, suspension and rustication from IBIT.

For details consult Plagiarism Policy of PU at http://pu.edu.pk/dpcc/downloads/Plagiarism-Policy.pdf

Grading System:

Letter Grade	Grade Point	Num Equivalence
A	4.00	85 – 100 %
A-	3.70	80 – 84 %
B+	3.30	75 – 79%
B	3.00	70 – 74 %
B-	2.70	65 – 69 %
C+	2.30	61 – 64 %
C	2.00	58 – 60 %
C-	1.70	55 – 57 %
D	1.00	50 – 54 %
F	0.00	Below 50 %
I	Incomplete	*
W	Withdraw	*

Norms to Course:

- ✓ *Submission Date and Time for the term instruments is always **Un-Extendable**.*
- ✓ *5 Absentees in class will result in forced withdrawal. **(PU Policy)***
- ✓ *Re-sit in Mid and Final Term will cause you a loss of 2 and 3 grade marks respectively. **(PU Policy)***
- ✓ *This is your responsibility to keep track of your position in class evaluation units.*
- ✓ *After the submission date, NO excuse will be entertained.*
- ✓ ***Keep a copy of all submitted Grading Instruments.***
- ✓ *Assignment is acceptable only in its Entirety.*
- ✓ *No make up for any assignment and quiz.*
- ✓ *Copied & Shared work will score Zero.*
- ✓ *Assignments are Individual.*

Good Luck

For the Spring Term