



NATIONAL UNIVERSITY
of Computer & Emerging Sciences, Lahore

Department of Computer Science

CS118 - Programming Fundamentals FALL 2020

Instructor Name: Waqas Manzoor

TA Name:

Muhammad
Kamraan

Email address: Waqas.manzoor@nu.edu.pk

Email address: l174308@lhr.nu.edu.pk

Office Location/Number: Liberty Lab

Office Hours: Thu- Sat 3:00-4:00 p.m.

Course Information

Program: BS (CS)
Core

Credit Hours: 3 + 1 (Lab)

Course Type:

Class Meeting Time: Section E: Thu- Sat 11:00 - 12:30 PM

Class Venue: E&M-11

Class Meeting Time: Section F: Thu- Sat 12:30 - 02:00 PM

Class Venue: E&M-11

Course Description/Objectives/Goals:

- To introduce the notion of algorithms.
- To develop problem solving and logic building skills in students.
- To introduce the basic concepts of programming in C++, including basic data types, expressions, iterations, functions and arrays.

Course Learning Outcomes (CLOs):

At the end of the course students will be able to:	Domain	BT* Level
Understand basic problem solving steps and logic constructs	C	2
Apply basic programming concepts	C	3
Design and implement algorithms to solve real world problems and should be able to translate a problem statement into pseudo-code/C++ code	C	3
* BT= Bloom's Taxonomy, C=Cognitive domain, P=Psychomotor domain, A= Affective domain		
Bloom's taxonomy Levels: 1. Knowledge, 2. Comprehension, 3. Application, 4. Analysis, 5. Synthesis, 6. Evaluation		

Course Textbook

1. C++ Programming: Program Design Including Data Structures, by D. S. Malik (8th Edition)
2. C++: How to Program? by Deitle & Deitle (9th Edition)

Additional references and books related to the course:

1. Theory and Problems of Programming with C++ by John R. Hubbard, 2nd Edition
2. Programming and Problem Solving with C++, Nell Dale
3. www.learncpp.com

Tentative Weekly Schedule

Week 1 Problem Solving and Programming Introduction	Lecture 1 Introduction to Computing, Basic Computer architecture, Computational Problems, Algorithms and Problem Solving	Lecture 2 Thinking logically, Solving logical problems. Programming Language, Program Compiler and Linker, Basic output, Concept of variables.
Week 2 Simple C++ Programs	Lecture 1 C++ simple datatypes (int, float, double, char, bool), variables declaration, assignment operator, input, output.	Lecture 2 C++ Operators (Arithmetic, Logical, and Relational) Use of operators for different datatypes.
Week 3 Simple C++ Programs	Lecture 1 Precedence of Operators. Designing complex expressions for mathematical type conversion problems. Typecasting in C++.	Lecture 2 Logical decision making and solving logical problems with selection structure.
Week 4 Simple C++ Programs If/Else	Lecture 1 Programs with if/else statements	Lecture 2 Programs with nested if/else statements
MID 1		
Week 6 Loops	Lecture 1 Repetitions using while loops	Lecture 2 Problems on while loops
Week 7 Nested Loops	Lecture 1 Repetitions using while and for loops	Lecture 2 Problems on nested loops
Week 7 Nested Loops and If/Else	Lecture 1 Repetitions with selection structure	Lecture 1 Nested loops with selection structure
Week 8 Functions	Lecture 1 Function definition and Calling: Parameters and return types;	Lecture 2 Types of parameters (value and reference) stack rolling and unrolling.
Week 9 Functions & File I/O Collections of data	Lecture 1 Reading and Writing from text files	Lecture 2 How to define and use fixed sized arrays. Arrays, if/else and loops
Week 10 CStrings	Lecture 1 Linear and Binary Search, Array Reversal, Detecting Palindromes	Lecture 2 Character arrays and CStrings
MID 2		
Week 11 Arrays, functions	Lecture 1 Character arrays and CStrings	Lecture 2 Functions with 1D array parameters

Week 12 Functions with nested loops	Lecture 1 Bubble Sort & Selection Sort	Lecture 2 Substring Finding
Week 13 Multidimensional arrays	Lecture 1 How multidimensional arrays are stored and used	Lecture 2 Programs with multidimensional arrays, e.g. matrix addition and multiplication
Week 14 Char Arrays with functions	Lecture 1 2D char arrays	Lecture 2 Bitwise Operators

(Tentative) Grading Criteria:

1. Assignments + Homework **(10 %)**
 2. Quizzes **(10 %)**
 3. Midterms **(25 %)**
 4. Project **(10 %)**
 5. Final Exam **(45 %)**
- o Grading scheme for this course is **Absolute** under application of CS department's grading policies.
 - o Minimum requirement to pass this course is to obtain at least **50%** absolute marks

Course Policies:

- o Quizzes may be announced or surprise.
- o No Makeup Quizzes.
- o All assignments and homework must be done individually.
- o Late Submissions of assignments will not be accepted.
- o **Plagiarism** in any work (Quiz, Assignment, Midterms, Project and Final Exam) from any source, Internet or a Student will result in **deduction of absolute marks or F** grade.
- o Minimum **80%** attendance is required for appearing in the Final exams.