



Institute of Computer Sciences & Information Technology (ICS&IT)
Faculty of Management and Computer Science (FMCS)
The University of Agriculture, Peshawar

CC-301 – Programming Fundamentals

General Information

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| Instructor | Engr. Waseem Ullah Khan |
| Credit hours | 3 Units |
| Course delivery | Lecture: 3 hours/wk |
| Prerequisite(s) | NIL |
| Semester | 1 st Semester |
| Lecture hours | Sec A: Monday, 11:20-12:10 (Mian Library), Wednesday, 01:30-02:20 (Computer Systems Lab 2), Thursday, 12:10-01:00 (General Purpose Lab 1) Sec B: Monday, 01:30-02:20 (General Purpose Lab 1), Wednesday, 12:10-01:00 (Computer Systems Lab 2), Thursday, 02:20-03:10 (General Purpose Lab 1) Sec C: Monday, 02:20-03:10 (Computer Systems Lab 2), Wednesday, 01:30-02:20 (General Purpose Lab 1), Thursday, 11:20-12:10 (Computer Systems Lab 2) Sec D: Monday, 12:10-01:00 (General Purpose Lab 1), Tuesday, 02:20-03:10 (Computer Systems Lab 2), Thursday, 01:30-02:20 (General Purpose Lab 1) |
| Online resources | Google Classroom, Google Drive |
| Contact | waseem@uetpeshawar.edu.pk, Faculty Offices ICS&IT |

Statement

This course is designed to develop concepts of programming language using C++, which is important for higher level programming. After completing this course, the students will be able to make small and medium programs.

CC 301: Programming Fundamentals

Credit Hours: 3

Contact Hours: 3

1. COURSE OUTLINE:

This course provides an introduction to computer programming. It discusses low-level and high-level computer Languages and gives a revision of computer fundamentals. It outlines the essential features of C++ programming language: data types, arrays, strings, records and pointers. It also gives a detailed overview of essential programming features like control structures, repetition statements, arrays, file I/O and recursion. It will discuss pointers and its use in data manipulation.

2. Weekly Plan

| Week | Contents |
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| Week 1 | <ul style="list-style-type: none">• Introduction to Programming Languages• History of C++• Basic elements of C++<ul style="list-style-type: none">▪ C++ character set▪ C++ words<ul style="list-style-type: none">✓ Reserve words✓ User define words/identifier▪ Rules for identifier |
| Week 2 | <ul style="list-style-type: none">• Basic Data Types<ul style="list-style-type: none">▪ Int▪ Float▪ Char▪ Modifiers<ul style="list-style-type: none">✓ Long✓ Signed✓ Unsigned✓ Double✓ Long Double✓ Short |
| Week 3 | <ul style="list-style-type: none">• Numbers<ul style="list-style-type: none">▪ Integer Numbers▪ Real Numbers• Types of identifiers<ul style="list-style-type: none">▪ Constant identifier▪ Variable identifier• Statement<ul style="list-style-type: none">▪ Single statement• Compound statement Program |
| Week 4 | <ul style="list-style-type: none">• General Structure of C++ Program• Output Statement• Input Statement• String/message<ul style="list-style-type: none">▪ Char/Char identifier• Assignment Statement |

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| | <ul style="list-style-type: none"> • Operators <ul style="list-style-type: none"> ▪ Arithmetic Operators ▪ Relational Operators ▪ Logical Operators |
| Week 5 | <ul style="list-style-type: none"> • Expression • Initialization Statement • Increment Operator (Prefix & Postfix forms) • getch () function • getche () function • Escape sequences |
| Week 6 | <ul style="list-style-type: none"> • Comments in C++ Program • Pre-processor Directives • Difference between Declaration & Definition • Arithmetic Assignment Expression • Priority of Operators • Conversion of Mathematical formula into C++ expression |
| Week 7 | <ul style="list-style-type: none"> • Control structures/Decision Control structure <ul style="list-style-type: none"> ▪ Transfer of control Statements (TOCS) ▪ Repetitive Control structure/statements (Loops) • Conditional TOCS <ul style="list-style-type: none"> ▪ Single alternative if statement <ul style="list-style-type: none"> ✓ Nested if statement ▪ Double alternative if statement (if-else statement) <ul style="list-style-type: none"> ✓ Nested if-else statement |
| Week 8 | <ul style="list-style-type: none"> • Conditional operator/Ternary Operator (? :) • Switch statement/Multiple Branching statement <ul style="list-style-type: none"> ▪ Nested Switch statement |
| Week 9 | <ul style="list-style-type: none"> • Manipulators <ul style="list-style-type: none"> ▪ endl manipulator ▪ setw manipulator • Continue Statement • Break Statement • Go to Statement |
| Week 10 | <ul style="list-style-type: none"> • Loop <ul style="list-style-type: none"> ▪ Types of Loop ▪ Fixed loop (count control loop) |

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| | <ul style="list-style-type: none"> ▪ Non-fixed loop (event control loop) ▪ Fixed loop/for loop ▪ Variations in for loop <ul style="list-style-type: none"> ✓ Defining variable in for loop ✓ Multiple initializations in for loop ✓ Multiple inc/dec expressions in for loop ✓ Initialization outside for loop ✓ Inc/dec expression inside for loop ✓ No testing (infinite loop) ✓ Output statement inside for loop ✓ Nested for loop |
| Week 11 | <ul style="list-style-type: none"> • Non-fixed loop (event control loop) <ul style="list-style-type: none"> ▪ While loop (pre-tested loop) ▪ Do while loop (post-tested loop) ▪ Nested while & do-while loop |
| Week 12 | <ul style="list-style-type: none"> • Arrays • Types of Array <ul style="list-style-type: none"> ▪ One-dimensional array ▪ Two-dimensional array |
| Week 13 | <ul style="list-style-type: none"> • Sorting and searching <ul style="list-style-type: none"> ▪ Bubble sort ▪ Linear search • Strings (array of characters) |
| Week 14 -15 | <ul style="list-style-type: none"> • Function • Types of Function <ul style="list-style-type: none"> ▪ Built-in function ▪ User-defined function ▪ Parts of user defined function ▪ Function with values and no return ▪ Function with values and return ▪ Passing values from a function ▪ Passing arguments to a function |
| Week 16 | <ul style="list-style-type: none"> • Pointers Basic Concepts • Structure <ul style="list-style-type: none"> ▪ Specifying structure ▪ Defining structure variable ▪ Accessing structure members |

3. Resources

- TEXT BOOK
 1. Deitel and Deitel, “C++ How to Program”, 7th Edition
 2. Robert Lafore, Object-Oriented Programming in C++, 3rd Edition
- REFERENCE BOOKS
 1. Behrouz A. Forouzan, “A Structured Programming Approach Using C++”