ICT 1.2: INTRODUCTION TO PROGRAMMING

I. Course description:

1. **Credit points**: 4 ECTS
2. **Time commitment:** 40h

Items	Lecture	Lab-work	Tutorial	**Total**
No. of hours	25	12	0	**37**

3. **Prerequisites**: No
4. **Recommended background knowledge**: No
5. **Subject description:**

The C programming language is one of the most popular programming languages. Despite being fairly old programming language, it is widely used for system and application software. because of its efficiency and control.

This course is intended for beginners who do not have any prior knowledge or have very little knowledge of computer programming. All basic features of C programming language are included in detail such as basic syntax, data types, operators, control flow, functions, arrays, pointers, union, structure, and the standard c library.

In this course, you will not only learn the C programming language, but you also improve your computational skills beneficial to your major field of study.

The following list includes the main topics covered in the course:

a. Introduction to C programming language
b. Variables, data types, operators and expressions
c. Input and output functions
d. Control Flow: Decision and Loops
e. Functions
f. Array and String
g. Pointers
h. Structure and Union
i. File I/O
j. C Standard Library

6. **Objectives & Outcome:**

Upon completion of this course, students will be able to:

- Understand the basic terminology used in computer programming
- Write, compile and debug programs in C language

- Use different data types in a computer program
- Manipulate various control flow constructs
- Utilize arrays and pointers to efficiently solve problems
- Use different data structures or create your own data types
- Use funtions from the standard C library
- Learn the basics of numerical methods to solve practical problems

7. Assessment/ Evaluation:

Component	Attendance	Exercises	Assignments	Reports	Midterm	Final
Percentage %	10	0	20	0	30	40

8. Prescribed Textbook(s):

[1] B. W. Kernighan and D. M. Ritchie, *The C Programming Languge, 2nd edition*, Prentice Hall, 1989.

II. Course content & schedule:

1. Introduction to C Programming
   - A Brief History of C
   - Components of a C Program
   - C Keywords and Identifiers
   - Compiling and Executing a C Program
   - Programming Tools: Compilers, Interpreters, Editors
   - C Input and Output Functions
   - C Preprocessors
2. Variables, Data Types, Operators and Expressions
   - Variables and Constants
   - Basic Data Types in C
   - Programming Operators and Expressions
3. Control Flow I
   - Statement and Blocks
   - Logic Expressions
   - Decision Making-If..Else
   - Decision Making- Switch..Case
4. Control Flow II
   - For Loops
   - While Loops
   - Do..While Loops
   - Break and Continue
5. Functions

- Standard C Library's Basic Functions
- User-Defined Functions, Declaration, Definition, Value Returning and Parameter Passing
- Recursive Functions

6. Arrays and Strings
   - Array Introduction
   - Multi-dimension Arrays
   - Arrays as Arguments to Functions
   - Strings, Arrays of Characters
   - String Functions
7. Pointers
   - Pointer Introduction,
   - Pointer Operators and Operations
   - Pointers and Arrays
   - Pointers and Functions
   - Dynamic Memory Allocation
8. Structure and Union
   - Structure Introduction
   - A New Data Type
   - Structures and Funtions
   - Pointers to Structures
   - Arrays of Structures
   - Unions
9. File I/O
   - Stream File
   - Text File Functions
   - Binary File Functions
10. Graphic Library-OpenGL
    - Introduction to OpenGL
    - Set up Graphic Enviroment
    - Basic Drawing Functions

III. Reference Literature:

[1]. P. J. Plaugher, *The Standard C Library*, Prentice Hall, 1991

[2]. Brian P. Flannery, Saul Teukolsky, William H. Press, and William T. Vetterling, *Numerical Recipes in C: The Art of Scientific Computing*, 2nd edition, 1992.