

COURSE SYLLABUS

CSC10001 – Introduction to Programming

1. GENERAL INFORMATION

Course name: Introduction to Programming

Course name (in Vietnamese): Nhập môn lập trình

Course ID: CSC10001

Knowledge block: Core – Computer Science

Number of credits: 4

Credit hours for theory: 45

Credit hours for practice: 30

Credit hours for self-study: At least 90

Prerequisite:

Prior-course:

Instructors:

2. COURSE DESCRIPTION

This is the very first course to take students to programming road. Through this course, the programming-related concepts are introduced to students to provide them good understandings, and foundations for the following courses: computer program, programming languages, algorithms, etc. Students will learn how to solve the problems in computer and how to express the algorithms in different forms (natural language, pseudo-code, flowchart). In this course, C++ is used as a demonstrated programming language. Students will comprehend clearly about structure of a (general and/or C++ specific) program; effectively use variables and data types and manipulate important elements (such as selection structures, repetition structures and functions) as well. In addition, students will study arrays (one-dimensional arrays, two-dimensional arrays, multi-dimensional arrays), struct data types, input/output operations with console or text file streams.

3. COURSE GOALS

On successful completion of this course, students will be able to

ID	Description	Program LOs
G1	Explain the fundamental concepts of programming	1.2.1, 1.2.2, 2.1.5
G2	Illustrate the algorithms in different forms	1.2.1, 1.2.2
G3	Use the basic programming structures	1.2.1, 1.2.2
G4	Apply the compound programming structures	1.2.1, 1.2.2
G5	Conduct the console/text file input/output operations	1.2.1, 1.2.2
G6	Implement a well-organized C++ programs to solve the basic problems	1.2.1, 1.2.2, 2.3.1
G7	Express the programming terminologies in English-Vietnamese and vice versa	2.4.2, 2.4.3, 2.4.5

4. COURSE OUTCOMES

CO	Description	I/T/U
G1.1	Explain the concepts of program, statement, expression, etc.	T, U
G1.2	Express the concepts of algorithm, pseudo-code, flowchart.	T, U
G1.3	Identify types of programming languages, compilation, interpretation.	T
G2.1	Design the algorithms expressed in flowcharts.	T, U
G2.2	Design the algorithms expressed in pseudo-code.	T, U
G3.1	Choose proper variable name and data type.	T, U
G3.2	Employ the selection structures: if, if..else, switch..case	T, U
G3.3	Employ the repetition structures: while, do..while, for	T, U
G4.1	Use one-dimensional arrays.	T, U
G4.2	Use two-dimensional arrays and multi-dimensional arrays.	T, U
G4.3	Produce struct data types.	T, U
G5.1	Manipulate the console input/output operations.	T, U

CO	Description	I/T/U
G5.2	Manipulate the read/write operations from/to text files.	T, U
G6.1	Implement the user-defined functions to solve basic problems.	T, U
G6.2	Construct well-organized C++ programs.	T, U
G7.1	Translate course-related English terminologies.	I, T
G7.2	Comprehend course-related English texts, topics.	I
G7.3	Restate course-related English video clips.	I

5. TEACHING PLAN

ID	Topic	Course outcomes	Teaching/Learning Activities
1	Introduction to programming	G1.1, G1.2, G1.3, G1.4, G7.1, G7.2	Lecturing Q&A, Group discussion
2	How to solve a problem Algorithms	G2.1, G2.2, G7.1, G7.2, G7.3	Lecturing Q&A, Group discussion
3	Fundamental elements of programming	G1.4, G3.1, G5.1	Lecturing Q&A, Group discussion
4	Flow of control: Selection Structures	G3.2, G3.3, G7.1, G7.2	Lecturing Q&A, Group discussion
5	Flow of control: Repetition Structures	G3.2, G3.3, G7.1, G7.2	Lecturing Q&A, Group discussion
6	Functions.	G6.1, G6.2	Lecturing Q&A, Group discussion

ID	Topic	Course outcomes	Teaching/Learning Activities
7	Array and String	G4.1	Lecturing Q&A, Group discussion
8	2-D Array and Multi-dimensional Array	G4.2, G4.3	Lecturing Q&A, Group discussion
9	Struct	G5.2	Lecturing Q&A, Group discussion
10	Text file Input/Output	G6.1, G6.2	Case study Q&A, Group discussion
11	Advanced Topics Final Review		Q&A, Group discussion

For the practical laboratory work, there are 10 weeks which cover similar topics as it goes in the theory class. Each week, teaching assistants will explain and demonstrate key ideas on the corresponding topic and ask students to do their lab exercises either on computer in the lab or at home. All the lab work submitted will be graded. There would be a final exam for lab work.

6. ASSESSMENTS

ID	Topic	Description	Course outcomes	Ratio (%)
A1	Assignments			30%
A11	Quiz Check-in assignments	Self-test quiz, and exercises to check the understanding	G1.1, G1.2, G1.3, G2.1, G2.2, G3.1, G3.2, G3.3, G4.1, G4.2, G4.3, G7.1	10%
A12	Weekly lab work: LW1–LW10	Practice on computer.	G2.2, G3.1, G3.2, G3.3, G4.1, G4.2,	20%

ID	Topic	Description	Course outcomes	Ratio (%)
			G4.3, G5.1, G5.2, G6.1, G6.2	
A2	Exams			70%
A21	Lab midterm exam	In-class programming exam on computer	G3.1, G3.2, G3.3, G5.1	10%
A22	Lab final exam	In-class programming exam on computer	G4.1, G4.2, G4.3, G5.1, G5.2, G6.1, G6.2	10%
A23	Midterm exam	Closed book exam. Describe the understanding of different topics. Give the algorithms and implement programs to solve problems	G3.1, G3.2, G3.3, G4.1, G5.2, G6.1	10%
A24	Final exam	Closed book exam. Describe the understanding of different topics. Give the algorithms and implement programs to solve problems	G3.1, G3.2, G3.3, G4.1, G4.2, G4.3, G5.1, G5.2, G6.1, G6.2	40%

7. RESOURCES

Textbooks

[1] Walter Savitch, *Absolute C++ (6th edition)*, Pearson, 2016

Reference Books

[2] Walter Savitch, *Problem Solving with C++ (9th edition)*, Pearson, 2015

[3] Trần Đan Thư, Nguyễn Thanh Phương, Đinh Bá Tiến, Trần Minh Triết, *Nhập môn lập trình*, Nhà xuất bản Khoa học và Kỹ thuật, 2018

Others

- [4]. Visual Studio Code, DevC,...
- [5]. Any text editors (Notepad++, TextMate, ..), g++,..
- [6]. Zoom.
- [7]. Office 365 (authenticated with student email account).
- [8]. draw.io

8. GENERAL REGULATIONS & POLICIES

- All students are responsible for reading and following strictly the regulations and policies of the school and university.
- Students who are absent for more than 3 theory sessions are not allowed to take the exams.
- For any kind of cheating and plagiarism, students will be graded 0 for the course. The incident is then submitted to the school and university for further review.
- Students are encouraged to form study groups to discuss on the topics. However, individual work must be done and submitted on your own.