



VIETNAM NATIONAL UNIVERSITY OF HO CHI MINH CITY
UNIVERSITY OF NATURAL SCIENCES
FACULTY OF INFORMATION TECHNOLOGY

COURSE SYLLABUS

Course Code:	TH012
Title:	Intermediate Programming A2
Credits:	3
Workload:	Lecture hours: 3 periods * 10 weeks = 30 periods Laboratory hours: 3 periods * 10 weeks = 30 periods Preparative hours:
Prerequisites:	TH010 or TH011 - Introduction to Computer Science A1

Course Objectives:

The objective of this course is to help students to master coherent and efficient programming techniques. It concentrates on general algorithmic design principles as well as careful coding of a given algorithm to generate fast code. With additional topics which introduce basic concepts from data structures, operating systems, data analysis, numerical methods, software engineering, compiler design, and computer organization, this course also provides students with a foundation for further study in later courses.

Main Text: N/A

References:

- *Efficient C programming. A practical approach*
Mark Allen Weiss.- New Jersey: Prentice Hall, 1995.
- *C: How to program*
H. M. Deitel and P. J. Deitel. - New Jersey: Prentice Hall, 1994.
- *C++ Programming and Problem solving*
Sanford Leestma and Larry Nyhoff - New York: Macmillan Publishing, 1993.

Course Outline:

Chapter 1 Overview of C

- 1.1 #include, #define
- 1.2 typedef
- 1.3 The *sizeof* operator
- 1.4 Arithmetic operations
- 1.5 Datatype conversions
- 1.6 Operations on bits
- 1.7 *main* function
- 1.8 *printf* and *scanf* functions

Chapter 2 Basic Structures and Instructions

- 2.1 Comparison operators
- 2.2 Logical operators
- 2.3 Conditional Instructions
- 2.4 Loop Instructions
- 2.5 Switch Instructions

Chapter 3 Functions

- 3.1 The structure of a functions
- 3.2 Modular programming
- 3.3 Parameters of Functions
- 3.4 Recursive Programming

Chapter 4 Preprocessor Statements

- 4.1 Macro without arguments
- 4.2 Macro with arguments

Chapter 5 Pointers

- 5.1 Pointer variables
- 5.2 The & operator and addresses of pointers
- 5.3 Pointer syntax
- 5.4 Using the *const* modifier with a pointer parameter in a function's parameter list
- 5.5 Passing pointers to functions
- 5.6 Function pointers

Chapter 6 Arrays

- 6.1 Basic concepts of arrays
- 6.2 Limitations and technical issues of arrays
- 6.3 Passing arrays as arguments to functions
- 6.4 Sorting an array
- 6.5 Multi-dimensional arrays
- 6.6 Dynamic arrays
- 6.7 Pointer arithmetic

Chapter 7 Characters and Strings

- 7.1 Characters
- 7.2 Character processing functions
- 7.3 Strings
- 7.4 String processing
- 7.5 Pointers and strings
- 7.6 Array of strings

Chapter 8 Structures

- 8.1 Syntax of structures
- 8.2 Array of structures
- 8.3 Pointers to a structure

Chapter 9 Recursive Programming

- 9.1 Proof by Induction
- 9.2 Basic concepts of recursive programming
- 9.3 Notes when using recursive programming
- 9.4 Some applications of recursive programming
- 9.5 Searching and sorting

Chapter 10 Files

- 10.1 File input and output
- 10.2 Input and output on text files
- 10.3 Input and output on binary files

Grading

Final exam :

Assignments: