CS121 - Programming Advanced, C++

Spring 2018 Syllabus
(Updated on January 2, 2018)

Instructor:	Thang Nguyen	**Time:**	15:00 – 18:20
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Introduction

Welcome to CS121, the second course in the series on programming, Mathematics and Informatics program.In this course will develop the skills needed to build programs. This class provides more information about running C/C++ programs under LINUX; pseudo-code, problem solving, some basic algorithms and program structure.

Topic covered include:

- Understanding of computer and programming;
- Programming in the C/C++ programming languages under Linux;
- Problem solving and program structure;
- Constants, variable, data-types, assignments, arithmetic expressions, input and output, control-flow, functions, arrays, pointer, structures and searching and sorting.

Although in this class our primary concern will be the correctness of programs, we will also be somewhat concerned with a program's efficient use of time and memory resource.

Online resource

The course home page provide up to date course information. All the lectures,hangouts, homeworks, programming projects, quiz, etc will be post there. The home page is at Elearning and Personal site.

Course Pages:

1. E-learning: https://elearning.thanglong.edu.vn
2. Personal site: https://thangdn.com/teaching
3. Forum: https://www.facebook.com/groups/tlucs121

Office hours: After official class times, or by appointment, or post your questions in the forum.

Teaching assistants:

1. Luong Thi Thuong Thuong, 0163.967.2073,thuongthuong.xgnh@gmail.com
2. Nguyen Dang Khanh, 0166.812.3988, khanhnd0408@gmail.com
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4. Pham Van Manh, 0968.864.783, phammanh.1221998@gmail.com
5. Nguyen Tu Anh, 0163.980.2255, tanh.lefthander@gmail.com

6. Nguyen Phu Tung, 0974.675.231, tung261298@gmail.com

Main References: This is a restricted list of various interesting and useful resources that will be touched during the course. You need to consult them occasionally.

- Stanley B. Lippman, Jose Lajoie, and Barbara E. Moo. 2012. *C++ Primer (5th Edition)*. Addison-Wesley Professional.
- Learn about working at `http://www.cplusplus.com/`
- Youtube channel: `https://www.youtube.com/channel/UCj9xVNnEURdzcWFi4Qecl9A`

Objectives: This course is primarily designed for newbies programming language, freshmen, ...

Prerequisites: An undergraduate-level understanding of probability, statistics, graph theory, algorithms, and linear algebra is assumed.

Tentative Course Outline:

Week 1
- Introduction, computers, algorithms, programs, compilers
- Variables, expressions, assignment, console I/O, predefined functions
- Lab 1, Quiz 1 and Homework 1

Week 2
- Selection, boolean expressions, if-else, multiway-if, switch
- Iteration, while loops, for loops, loop paradigms
- Quiz 2, Lab 2 and Homework 2

Week 3
- Midterm #1
- User-defined functions, procedural abstractions part I
- Programing project

Week 4
- User-defined functions, procedural abstractions part II
- Quiz 3, Lab 3 and Homework 3

Week 5
- Basic file I/O
- Quiz 4, Lab 4 and Homework 4

Week 6
- Arrays, strings
- Quiz 5, Lab 5 and Homework 5

Week 7
- Recursion
- Quiz 6, Lab 6 and Homework 6

Week 8
- Pointers and dynamic arrays
- Quiz 7, Lab 7 and Homework 7

Week 9
- Midterm #2
- To present your programming project

Final term
- Final exam

Downloadable ebook versions are available on E-learning.

Grading Policy:

- **Point process** = 7 homeworks and quizzes (40%), Midterm #1 (20%), Midterm #2 (20%), programming project (20%);
- **Final Grade** = **Point process**(30%), **Final exam**(70%).

Important Dates:

Midterm #1	Week 3
Midterm #2	Week 9
Programming project deadline	Week 9
Final Exam	Final term

Course Policy:

- Please enroll for the e-learning, then you will be able to see the course page.

Class Policy:

- Regular attendance is essential and expected.

Academic Honesty: Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation.

Quiz, Homework, Project and Exam

Quiz: We want to make sure you will not fall behind. So every new lesson, there will be a short quiz that will cover some of the highlights of that previous week. I will mention what sort of problems will be on the quiz during lecture times in a wee, so there will be no surprises. The quizzes will not count for much of your grade, but they will help you keep on the top of the material.

Homework and project: Roughly 7 homework assignments will be assigned, each with a due date (usually, one week). One of the main goals of this course is to enhance yours ability as a programmer and the homework assignments are designed with this goal in mind. Programming is not a spectator sport. It is unlikely that your ability to program will improve substantially just by listening to the lectures. It is important that you master the material covered in the homework BEFORE you take the quizzes and exams on that material. And soon most of your time will be spent on programing project, which are large & fun programs and applications!