

# Introduction to C++ Programming

## ITP 165 (2 Units)

---



**Fall 2013**

### Objective

This course will teach students problem solving skills through the use of the C++ programming language.

### Concepts

Programming fundamentals including variables, control statements, loops, and arrays, pointers, functions and object-oriented programming.

### Prerequisites

None. This class is intended for non-programmers.

### Instructor

Nathan Greenfield

### Contacting the Instructor

nathan.greenfield@usc.edu

### Office Hours

Listed on Blackboard under Contacts

### Lab Assistants

Listed on Blackboard under Contacts

### Lecture / Lab

One hour and 50 minutes, twice a week, for a total of 3 hours and 40 minutes.

2:00 pm – 3:50 pm, Tuesday and Thursday

### Required Textbooks

*Problem Solving with C++*. Walter Savitch. Addison-Wesley. ISBN-13: 9780132162739. The e-text can be found at [myProgrammingLab.com](http://myProgrammingLab.com) website where you may also find additional materials for study.

## Optional Textbooks

None.

## Website

All course material will be on Blackboard (<http://blackboard.usc.edu>).

## Grading

The following percentage breakdown will be used in determining the grade for the course.

Class Participation	5%
Lab Assignments	50%
Midterm Exam	20%
Final Project	25%
<hr/>	
Total	100%

## Grading Scale

The following shows the grading scale to be used to determine the letter grade.

93% and above	A
90% - 92%	A-
87% - 89%	B+
83% - 86%	B
80% - 82%	B-
77% - 79%	C+
73% - 76%	C
70% - 72%	C-
67% - 69%	D+
64% - 66%	D
63% and below	F

## Policies

No make-up exams (except for documented medical or family emergencies) will be offered nor will there be any changes made to the Final Exam schedule.

The labs will be posted on Blackboard under the "Assignments" section. Each lab will include instructions, a due date, and a link for electronic submission. Labs must be submitted using this link.

It is your responsibility to submit your assignments on or before the due date. Assignments turned in one day late will have 20% of the total points deducted from the graded score.

Assignments turned in two days late will have 50% of the total points deducted from the graded score. After two days, submissions will not be accepted and you will receive a 0.

After an assignment has been graded and returned you have up to 1 week to make corrections and resubmit the assignment to be re-graded. Only one re-grade submission will be considered per assignment.

All assignments will be digitally submitted through Blackboard except where specifically specified. Do not email them to the lecturer or lab assistant.

You are required to save your labs using a USB flash drive or a website such as <http://www.dropbox.com>. You must keep a copy of all labs. You will not be able to save your work on the ITP lab computers. If available, you will be given one USB flash drive from ITP.

ITP will have open lab hours starting the second week of the semester. The open labs will not have a lab assistant for this specific class. These lab times are there in case you need extra time to complete a lab.

A roster will be passed around the room during each lecture session. Please sign by your name for the appropriate week.

## **Incomplete and Missing Grades**

Excerpts for this section have been taken from the University Grading Handbook, located at <http://www.usc.edu/dept/ARR/grades/gradinghandbook/index.html>. Please see the link for more details on this and any other grading concerns.

A grade of Missing Grade (MG) “should only be assigned in unique or unusual situations... for those cases in which a student does not complete work for the course before the semester ends. All missing grades must be resolved by the instructor through the Correction of Grade Process. One calendar year is allowed to resolve a MG. If an MG is not resolved [within] one year the grade is changed to [Unofficial Withdrawal] UW and will be calculated into the grade point average a zero grade points.

A grade of Incomplete (IN) “is assigned when work is no completed because of documented illness or other ‘emergency’ **occurring after the twelfth week** of the semester (or 12<sup>th</sup> week equivalency for any course scheduled for less than 15 weeks).”

## **Academic Integrity**

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. *Scampus*, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: <http://www.usc.edu/dept/publications/SCAMPUS/gov/>. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: <http://www.usc.edu/student-affairs/SJACS/>.

## **Students with Disabilities**

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to your course instructor (or TA) as early in the semester as possible. DSP is located in STU 301 and is open from 8:30am to 5:00pm, Monday through Friday. Website and contact information for DSP [http://sait.usc.edu/academicsupport/centerprograms/dsp/home\\_index.html](http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html) (213) 740-0776 (Phone), (213) 740-6948 (TDD only), (213) 740-8216 (FAX) [ability@usc.edu](mailto:ability@usc.edu)

## **Emergency Preparedness/Course Continuity in a Crisis**

In case of emergency, when travel to campus is difficult, if not impossible, USC executive leadership will announce a digital way for instructors to teach students in their residence halls or homes using a combination of the Blackboard LMS (Learning Management System), teleconferencing, and other technologies. Instructors should be prepared to assign students a "Plan B" project that can be completed 'at a distance.' For additional information about maintaining your classes in an emergency, please access: <http://cst.usc.edu/services/emergencyprep.html>

# Introduction to C++ Programming

## ITP 165 (2 Units)

---

### Course Outline

Note: Subject to change

#### Week 1 – Introduction

- Course overview
- About programming

#### Reading

Chapter 1

#### Assignment/Lab

- Lab 0 – Tool setup
- Lab 1 – Instruction list

#### Week 2 – Variables and operators

- Variables and data types
- Keyboard input
- Screen output

#### Reading

Chapter 2

#### Assignment/Lab

- Lab 2 – Mad Libs

#### Week 3 – Flow of control

- Expressions
- Branching code

#### Reading

Chapter 2

#### Assignment/Lab

- Lab 3 – Vending machine

#### Week 4 – Flow of control (part 2)

- Boolean expressions
- Multipath branches
- Loops

#### Reading

Chapter 3

#### Assignment/Lab

- Lab 4 – Temperature conversion

### **Week 5 – Functions**

- Using C++ functions
- Defining functions
- Variable scope

#### **Reading**

Chapter 4

#### **Assignment/Lab**

Lab 5 – Largest number and factorial

### **Week 6 – Functions (part 2)**

- Returning data from functions
- Call by reference parameters
- Debugging

#### **Reading**

Chapter 5

#### **Assignment/Lab**

Midterm preparation

### **Week 7 – Midterm**

### **Week 8 – Input and output streams**

- Streams
- File input and output
- Character input and output
- Introduction to classes

#### **Reading**

Chapter 6

#### **Assignment/Lab**

Lab 6 – Name searcher

### **Week 9 – Arrays**

- Static arrays
- Multidimensional static arrays

#### **Reading**

Chapter 7

#### **Assignment/Lab**

Lab 6 – Name searcher

### **Week 10 – Strings and vectors**

- C and C++ style strings
- String class
- Vectors

#### **Reading**

Chapter 8

### **Assignment/Lab**

Lab 7 – Hex adder

### **Week 11 – Pointers**

- Pointers
- Memory management

### **Reading**

Chapter 9

### **Assignment/Lab**

Lab 7 – Hex adder

### **Week 12 – Pointers and dynamic arrays**

- Dynamic arrays
- Pointer arithmetic

### **Reading**

Chapter 9

### **Assignment/Lab**

Lab 8 – Hex adder 2.0

### **Week 13 – Defining classes**

- Structures
- Classes

### **Reading**

Chapter 10

### **Assignment/Lab**

Lab 8 – Hex adder 2.0

### **Week 14 – Using classes**

- Abstract data types
- Inheritance

### **Reading**

Chapter 10

### **Assignment/Lab**

Final project

**Week 15 – Expanding classes**

- Friend functions
- Overloading operators
- Arrays in classes
- Classes and dynamic arrays

**Reading**

Chapter 11

**Assignment/Lab**

Final project

**Final Exam/Project****Assignment**

Final project due at the end of the scheduled final exam time