



Introduction to C Programming

ITP 110x (2 Units)

Objective Fundamentals of C; survey of C compilers; the role of C in developing Unix and other operating systems

Concepts Understanding programming logic, flow of control, and algorithm development. Using C to program algorithms that are elegant and efficient. How to go from program statement to working code. Debugging logical and syntactical errors quickly and efficiently. Learning how to program robust, user-friendly applications

Prerequisite None

Lecture 1.5hrs/week

Lab 1.5hrs/week

Textbook C for Business Programming, *John C. Molluzzo*

Grading The following point-structure will be used in determining the grade for the course. Final grade will be based upon the total points received, the highest total in the class, and the average of the class.

Projects	100
Midterm	100
Final Project	100
Final Exam	100
Total	400

- Policies**
- Make-up policy for exams: In order to make up for a missed exam, the student must provide a satisfactory reason along with proper documentation. Usually make-ups are allowed only under extraordinary circumstances.
 - Projects: It is YOUR responsibility to turn in your lab projects on, or before, the deadlines as set by the instructor. IT IS NOT THE RESPONSIBILITY OF THE LAB TA!
 - Late Projects: Late submission of projects will result in loss of points, so please turn in your projects on time! No projects will be accepted after 2 weeks beyond the project's original due date. Everything regarding a project should be settled within 2 weeks of the project's due date.
 - Though working together is encouraged, the projects must be your own effort. "Duplicate" projects will all receive zero points and possible referral to the Office for Student Conduct.

- All students should read, understand and abide by the University Student Conduct Code
<http://www.usc.edu/dept/publications/SCAMPUS/governance/gov03.htm>

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Course Outline

Week 1 - Introduction

- Programming and languages
- Generations of languages
- Role of C
- Advantages of C
- C and Unix
- C compilers

Week 2 – Programming Process

- Defining the problem
- Algorithm Development
- Coding
- Debugging
- Documenting

Reading Assignment: *Chapters 1*

Week 3 – Variables

- Defining variables
- Types of variables
- Assigning and initializing

Reading Assignment: *Chapters 2, 3*

Project: Write a program to read user input and compute a simple phone bill. Output the results in a tabular form.

Week 4 – Operators

- Arithmetic operators
- Logical operators
- Building expressions

Reading Assignment: *Chapters 4*

Week 5 – Input/Output

- Input and output functions
- Conversion specifications
- Formatting output

Reading Assignment: *Appendix C*

Week 6 – Selection

- Decision making using *if*
- Complex decisions
- Nested *if* statements
- Switch statement
- Break and continue statement

Reading Assignment: *Chapter 7, 8*

Project:

Week 7 – Iteration and looping

- Definite and indefinite iterations
- *while* statement
- *do* loop
- *for* loop

Reading Assignment: *Chapter 5, 6*

Project: Write a program to compute the monthly payment for a loan and use loops to create an amortization table of the loan payments.

Week 8 - Midterm

Covers material from weeks 1 – 8

Week 9 – More looping

- Using loops for repetitive tasks
- Counting with loops
- Nested looping

Reading Assignment: *Chapters 5, 6*

Week 10 - Functions

- User-defined vs. built-in functions
- Passing arguments to functions

Reading Assignment: *Chapter 9*

Project: Write a program to compute the Net Present Value of an Investment

Week 11 – Modular design

- Using functions to create modular programs
- Linking external functions
- Function libraries

Reading Assignment: *Chapter 10*

Week 12 – Arrays

- Defining and initializing an array
- 2D and multidimensional arrays
- Processing array elements
- Sorting arrays

Reading Assignment: *Chapter 11*

Week 13 – Characters and strings

- Characters as integers
- Strings as character arrays
- Processing strings

Reading Assignment: *Chapter 12, 13*

Project: Write a program to compute the day of the week a person was born based on their day of birth

Week 14 – String Functions

- Using string functions
- Passing strings to functions
- String I/O

Reading Assignment: *Chapter 12, 13*

Week 15 – File Processing

- File I/O
 - Reading and writing to files
- Reading Assignment:** *Chapter 15*

Week 16 - Final Exam