

**CSC 215
COMPUTER SCIENCE I**

Course Information
Spring 2007: M 2:00PM–4:50PM

Professor: Orlando Hernandez

Course Description: A first course in computer science for science, mathematics, and engineering majors. Emphasis is on using computational methods to solve scientific problems. High level programming languages will be used to teach structured programming and algorithm development. Topics include control structures, data typing, including structures and arrays, parameterized procedures, and recursion as well as simple I/O control.

Instructor Information: Office Location: AR 159
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Office Hours: Wednesdays 8:30 AM - 9:50 AM
Thursdays 4:00 PM - 5:20 PM
By appointment (send me email)
And whenever my office door is open

Textbook: *C++ for Engineers and Scientists*, Second Edition, by Gary J. Bronson, Thomson Course Technology, 2006.
ISBN 0-534-99380-X
Introduction to MATLAB® 7, by Delores M. Etter, David C. Kuncicky, with Holly Moore, Pearson Prentice Hall, 2005.
ISBN 0-13-147492-8

Grading Policy:

Homework	10%
Homework to be collected for grading will be announced for each chapter after the chapter has been covered, and it will be due one week after announcement.	
Labs	20%
Four Tests	40% (10% each)
Final Project	10%
Comprehensive Final Exam	20%

Tips for Success: Read the book sections prior to their discussion in class.
Do as much homework as possible. Attempt to do all the problems, even the ones that have not been assigned.
Do not be shy about asking questions, either during class or outside of the class.

Tentative Agenda:

Week	Topics	Reading
1 Monday 1/22	C++: INTRODUCTION Introduction to Programming Problem Solution and Software Development Algorithms	CHAPTER 1

Tentative Agenda (continued):

Week	Topics	Reading
	C++: PROBLEM SOLVING USING C++ Introduction to C ++ Programming Style Data Types Arithmetic Operators Variable and Declaration Statements Applying the Software Development Procedure	CHAPTER 2
2 Monday 1/29	C++: ASSIGNMENTS, FORMATTING, AND INTERACTIVE INPUT Assignment Operations Formatting Numbers for Program Output Using Mathematical Library Functions	CHAPTER 3
3 Monday 2/05	C++: ASSIGNMENTS, FORMATTING, AND INTERACTIVE INPUT Program Input Using the <code>cin</code> Object Symbolic Constants	
4 Monday 2/12	DISCUSSION OF LAB #1 TEST #1 C++: SELECTION STRUCTURES Selection Criteria The <code>if-else</code> Statement	CHAPTER 4
5 Monday 2/19	C++: SELECTION STRUCTURES Nested <code>if</code> Statements The <code>switch</code> Statement	
6 Monday 2/26	DISCUSSION OF LAB #2 C++: REPETITION STATEMENTS Basic Loop Structures <code>while</code> Loops Interactive <code>while</code> Loops <code>for</code> Loops Loop Programming Techniques Nested loops <code>do while</code> Loops	CHAPTER 5
7 Monday 3/05	DISCUSSION OF LAB #3 TEST #2 C++: MODULARITY USING FUNCTIONS Function and Parameter Declarations Returning a Single Value Returning Multiple Values	CHAPTER 6
8 Monday 3/12	SPRING BREAK	

Tentative Agenda (continued):

Week	Topics	Reading
9 Monday 3/19	DISCUSSION OF LAB #4 C++: I/O FILES STREAMS AND DATA FILES I/O File Stream Objects and Methods Reading and Writing Character-Based Files Exception and File Checking Random File Access File Streams as Function Arguments	CHAPTER 8
10 Monday 3/26	C++: ARRAYS One-Dimensional Arrays Array Initialization Declaring and Processing Two-Dimensional Arrays	CHAPTER 11
11 Monday 4/02	DISCUSSION OF LAB #5 TEST #3 MATLAB: INTRODUCTION TO ENG. PROBLEM SOLVING Grand Challenges Computing Systems An Engineering Problem Solving Methodology	CHAPTER 1
12 Monday 4/09	MATLAB: MATLAB ENVIRONMENT Getting Started Solving Problems in MATLAB Saving Your Work	CHAPTER 2
13 Monday 4/16	DISCUSSION OF LAB #6 MATLAB: PREDEFINED MATLAB FUNCTIONS Using Predefined Functions Manipulating Matrices	CHAPTER 3
14 Monday 4/23	DISCUSSION OF FINAL PROJECT MATLAB: PREDEFINED MATLAB FUNCTIONS Computational Limitations Special Values and Functions	
15 Monday 4/30	DISCUSSION OF LAB #7 TEST #4 REVIEW	
16 Monday 5/07	COMPREHENSIVE FINAL EXAM	

Educational Objectives

(What TCNJ engineers should be able to accomplish during the first few years after graduation)

The School of Engineering at the College of New Jersey seeks to prepare its graduates:

- To contribute to the economic development of New Jersey and the nation through the ethical practice of engineering;
- To become successful in their chosen career path, whether it is in the practice of engineering, in advanced studies in engineering or science, or in other complementary disciplines;
- To assume leadership roles in industry or public service through engineering ability, communication skills, teamwork, understanding of contemporary global and socio-economic issues, and use of modern engineering tools;
- To maintain career skills through life-long learning and be on the way towards achieving professional licensure.

Electrical and Computer Engineering Program Outcomes

(What TCNJ Electrical and Computer Engineering students are expected to know and be able to do at graduation. What knowledge, abilities, tools and skills the program gives the graduates to enable them to accomplish the Educational Objectives)

The Program Outcomes listed below are expected of all graduates of the Electrical or Computer Engineering Program.

ECE graduates will have:

- a. an ability to apply knowledge of mathematics, science and engineering;
Math and Problem Solving are used extensively in homework problems, Labs, and tests.**
- b. an ability to design and conduct experiments, as well as to analyze and interpret data;
- c. an ability to design a system, component, or process to meet desired needs;
- d. an ability to function in multidisciplinary teams;
- e. an ability to identify, formulate and solve engineering problems;
- f. an understanding of professional and ethical responsibility;
- g. an ability to communicate effectively;
- h. the broad education necessary to understand the impact of engineering solutions in a global and societal context;
- i. a recognition of the need for and an ability to engage in life-long learning;
- j. a knowledge of contemporary issues;
- k. an ability to use the techniques, skills and modern engineering tools necessary for engineering practice;
Modern computer tools for software development are used heavily throughout the course.**
- l. an ability to analyze and design complex electrical and electronic devices;
- m. an ability to analyze and design software and systems containing hardware and software components.