

NEWARK COLLEGE OF ENGINEERING

SYLLABUS AND COURSE INFORMATION

Course Name: Numerical Computing for Engineering Technology

Course Number: ECET 344

Course Structure: 2-2-3 (lecture hr/wk – lab hr/wk – course credits)

Course Description: An introduction to the use of a computer to analyze and solve problems common in engineering. Using computers and the application language students will confront a variety of tasks that will promote an object oriented programming structure. The goal of this course is to understand and program routines commonly used in the design of computer algorithms for computer-based problems. Practical applications as well as mathematical programming are stressed.

Prerequisites: (CS 100 or CS 101 or CS 106 or CS 115) and (Math 238 or Math 112)

Corequisites: Math 309

**Required, Elective,
or Selected Elective:** Required

Required Materials: **Text:** Name: Problem Solving with C++
Author: Walter Savitch
Year: 2014
ISBN: 978-0-13-386221-8

Course Outcomes: By the end of the course students are able to:

1. Understand programming constructs and develop programs based on data types, program control, and data structures.
2. Apply classes and numerical analysis techniques to solve programming problems.
3. Develop classes with member functions
4. Understand, analyze, and develop object-oriented solutions to programming problems.
5. Develop solutions based on inheritance and templates.
6. Develop solutions based on standard template libraries.
7. Develop solutions that integrate numerical analysis techniques and object oriented design.
8. Develop file I/O solutions and understand basic data storage.
9. Communicate algorithms and issues related to programs in writing.
10. Write well-commented, maintainable code and documentation.

Class Topics:	Constructs	Data Types
	Program Control	Data Structure
	Classes	Objects
	Libraries	Member Functions
	Inheritance	Templates

NEWARK COLLEGE OF ENGINEERING

Algorithms

I/O

Student Outcomes: The Course Learning Outcomes support achievement of the following Student Outcomes from the ETAC of ABET Criterion 3 requirements.

Student Outcome a: An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly defined engineering technology activities.

Related Course Outcome: 3, 5, 6, 7, & 8

Student Outcome f: An ability to identify, analyze, and solve broadly-defined engineering technology problems.

Related Course Learning Outcomes: 2

Student Outcome l: The application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers, and engineering standards to the building, testing, operation, and maintenance of electrical/electronic(s) systems.

Related Course Learning Outcomes: 3 & 10

Student Outcome m: The application of natural sciences and mathematics at or above the level of algebra and trigonometry to the building, testing, operation, and maintenance of electrical/electronic systems.

Related Course Learning Outcomes: 7

Academic Integrity: NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. Please visit the Dean of Students website at <http://www.njit.edu/doss> for a list of student policies relating to academic integrity and student conduct.

Modification to Course: The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course Outline.

Prepared By: Daniel Brateris

Course Coordinator: Daniel Brateris