

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 106 or CS 113 or CS 114 or CS 115 or CS 116) and (Math 238 or Math 112)

Corequisites: None

**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. Develop testing protocols to verify software functionality.
10. Communicate algorithms and issues related to programs in writing.
11. Write well-commented, maintainable code and documentation.

Class Topics: Constructs Data Types
Program Control Data Structure
Classes Objects

NEWARK COLLEGE OF ENGINEERING

Libraries	Member Functions
Inheritance	Templates
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 1: An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly defined engineering problems appropriate to the discipline.

Related Course Outcome: 2, 3, and 4

Student Outcome 3: An ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments; and an ability to identify and use appropriate technical literature.

Related Course Learning Outcomes: 10 and 11

Student Outcome 4: An ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes.

Related Course Learning Outcomes: 9

Academic Integrity: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:
<http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

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

Updated: 11 March 2023