CS 116 Introduction to Computer Science II in C++

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Office Hours: Thursday 3:55 pm – 4:55 pm

I. COURSE DESCRIPTION:

A study of advanced programming topics with logical structures of data, their physical representation, design, and analysis of computer algorithms operating on the structures, and techniques for program development and debugging. Course covers program specifications, correctness and efficiency, data abstraction, basic aspects of simple data structures, internal searching and sorting, recursion and string processing. Algorithmic analysis is also discussed.

Prerequisite: CS 115

II. INSTRUCTIONAL MATERIALS:

Required Textbook: Data Structures & Other Objects Using C++, 4th edition.
ISBN: 0-13-212948-5, 978-0-13-212948-0. Authors: Michael Main, Walter Savitch

Reference Book: C++ How to Program, H.M.Deitel and P.J.Deitel, tenth edition, Prentice Hall (Pearson), 2017.

III. METHODS OF INSTRUCTION

Lectures, labs, projects, exams are used.

IV. METHODS OF EVALUATING STUDENT ACHIEVEMENT/ PROGRESS:

There will be **six programming projects** distributed roughly every two weeks in the first twelve weeks (counted 20% of your final grade). There will be **one midterm exam** (35% of your final grade), **one final exam** (35% of your final grade). Attendance is mandatory (10% of your final grade). The final grade will be curved.

V. CLASS SCHEDULE

Topics	Planned Lecture Topics	Read/Project
Topic 1	Introduction & Software Development	Ch.1
Topic 2	ADT & C++Classes	Ch.2.1-2.3, Project 1
Topic 3	More Classes and Operator Overloading	Ch.2.4-2.6
Lab 1	Project 1 Help Session	
Topic 4	Container Classes.	Ch. 3
Topic 5	Container Classes(cont.)	Ch.3, Project 2
Topic 6	Pointers and Dynamic Arrays(I)	Ch. 4.1-4.2
Lab 2	Project 2 Help Session	
Topic 7	Pointers and Dynamic Arrays (II)	Ch. 4.2-4.5
Topic 8	Dynamic Classes and the Big Three	Project 3
Topic 9	Linked Lists	Ch. 5.1-5.2 Project 4
Lab 3	Project 3 Help Session	
Topic 10	Building & Using the Linked List Toolkit	Ch. 5.3-5.6
Topic 11	Software Development Using Templates and Iterators	Ch.6
Topic 12	Stacks and Queues	Ch. 7, Ch. 8
Lab 4	Project 4 Help Session	
Midterm	Midterm Exam	
Topic 13	Introduction to Recursion	Ch. 9.1 Project 5
Topic 14	Using and Reasoning about Recursion	Ch. 9.2-9.3
Topic 15	Trees and Traversals	Ch. 10.1- Ch. 10.4
Lab 5	Project 5 Help Session	
Topic 16	Binary Search Trees and the Bag Class with a BST	Ch. 10.5,
Topic 17	Heaps and Priority Queues	Ch. 11.1, 11.2
Lab 6	Project 6 Discussion	Ch. 11.3
Topic 18	In Class Exercise for Tree	
Topic 19	Searching	Ch.12.1-12.2
Topic 20	Hashing	Ch 12.2-12.4
Topic 21	Quadratic Sorting	Ch 13.1
Topic 22	Recursive Sorting, Heap sort	Ch. 13.2- Ch 13.4
Final	Final Exam	

VI. Academic Integrity Policy

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: NJIT Academic Integrity Code.

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