APC 430: Applied Data Structures – Course Syllabus

IMPORTANT: This course syllabus document contains basic information about the course. A final syllabus with detailed guidelines, instructor information, project information, rubrics, course/university policies, and other course-related information will be provided to students upon course enrollment

Course Description and Objectives

This course covers fundamental concepts and the application of data structures and algorithms. Topics include abstract data types, dynamic arrays, iterators, linked lists, generics, stacks, queues, binary search trees, collections, maps, hashing, graphs, and sorting. It introduces a variety of application scenarios including graphics, web programming and user interfaces.

Students successfully completing the course will be able to:
- implement simple data structures (dynamic arrays, stacks, queues);
- explain the concepts of linked lists, binary search trees and hash tables;
- select an appropriate data structure for a specific task;
- write code that appropriately uses the selected data structures;
- implement simple algorithms (binary search, depth-first search, insertion sort);
- explain the concepts of merge sort, quick sort, breadth-first search;
- select an appropriate search or sorting algorithm for a specific task;
- write code that appropriately uses the algorithm;
- implement simple applications involving graphics, HTML and user interfaces.

Prerequisites
- APC 390: Object Oriented Programming

Grading

Evaluation Methods

Your final grade will be based on your performance on the following:

Item(s)	Number of Items	Percentage of Final Grade
Quizzes	12/14	24%
Interactive Sessions	10/14	10%
Labs	10/14	10%
Homeworks	13/14	52%
Final Assessment	1	4%
Total		100%

Programs and written assignments will be graded for correctness, suitability, style, clarity and practicality. Although we may provide solutions to some assignments, there are usually a wide variety of correct answers to any particular assignment.

N/14 means that we take the top N of 14 scores for use in the final grade.

Each student will make an appointment for a 10-minute session with the instructor during finals week. During the session, the student will discuss their work on the final homework assignment(s).

Grading Scale

The following grading scale is used to evaluate all course requirements and determine your final grade:

90–100%	A
80–89%	B
70–79%	C
60–69%	D
0–59%	F

Workload

Students should expect to spend 144 credit hours per semester to complete the activities and assignments in this course. In a fall or spring semester, the time to dedicate per credit will range between 7-10 hours per week and in summer semester between 10-13 hours.