Syllabus: COP 3415-04: Data Structures

Spring semester 2026

Course Information

- **Course Number and Title:** COP 3415-04: Data Structures
- **Credit Hours:** 3
- **Academic Term: Spring 2026**
- **Class Meeting Day, Time:** MWF: 4:00 PM – 4:50 PM
- **Class Meeting Location**: IST-1032

Instructor Information

- **Instructor:** Igor Mirsalikhov
- **Office Location:** IST-2027A
- **Office Hours**:
  - MWF 11 am - 12:50 pm.
  - or by appointment
- **E-mail**: imirsalikhov@floridapoly.edu

Course Details

- **Delivery Mode**: Face-to-Face learning experience with class meetings three times a week in the class meeting location specified above. Please check the Canvas course website for all information, including announcements, discussions, and any supplementary material for topics covered in this course.
- **Official Catalog Course Description**: This course examines the essential properties of algorithms and data structures. The data structures will be used as tools to aid in algorithm design and application.
  - **Pre-Requisites:** COP 2080 - CS Problem Solving and Solution and COP 3337 - Object Oriented Programming with a "C" or better grade
  - **Co-Requisites**: N/A
  - **Communication/Computation Skills Requirement (6A-10.030)**: No
- **Textbooks**: A. Drozdek, "Data Structures and Algorithms in C++," 4th Edition, Cengage Learning, 2012, ISBN-13: 978-1133608424
- **Equipment and Materials**: A personal computer with an installed C++ toolchain and at least an editor
- **Course Objectives**: To provide students with the capability of applying suitable data structures and design efficient algorithms toward problem solving.
- **Course Learning Outcomes**:

Course Learning Outcomes	Program Learning Outcome (ABET Criteria (CAC))	Learning Level*
Develop and apply solutions using the basic data structures	1, 2, 4	Application
Analyze and compare the efficiency of different data structures.	1,2,6	Analysis
Demonstrate understanding in applying data structures manipulating techniques	1,2,6	Application
Infer, write, and debug C++ programs that are using different data structures.	1,2	Analysis
Evaluate appropriate data structures through effective communication in a team environment for solving complex problems	1,2,3	Comprehension

ABET CAC Learning Outcomes:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computer science theory and software development fundamentals to produce computing based solutions.

Academic Support Resources

Library: Students can access the Florida Polytechnic University Library through the University website and Canvas, on and off campus. Students may direct questions to library@floridapoly.edu.

Peer Learning Strategists (PLS): Are specially trained student leaders who help their peers strategize approaches to course content and work through solution methods. PLS work in collaboration with the courses they support so the content and methods are aligned with your instructors' expectations. Students can meet with a PLS in The Learning Center, which is located on the first floor of the Innovation, Science and Technology (IST) building in room 1019.

Academic Success Coaches: All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.

Writing Center: Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit https://floridapoly.edu/writingcenter.

Course Schedule (Tentative)

We will cover most of the topics listed below. We might not cover all.

Week	Dates	Topic	Out of Class Student Homework and holidays
1	01/12/2026 - 01/18/2026	**Complexity Analysis** - Time and space complexity - Big-O Notation - Ω and Θ Notations	
2	01/19/2026 - 01/25/2026	**Complexity Analysis** - Best, Average, Worst Case	1/19 Martin Luther King Jr. Holiday - No Classes Assignment 1: Complexity Analysis
3	01/26/2026 - 02/01/2026	**Linked Lists** - Singly Linked Lists - Doubly Linked Lists - Circular Lists	
4	02/02/2026 - 02/08/2026	**Queues** - Queues functions(Enqueue, Dequeue, …) - Priority Queues - Linked list implementation of Queues - Array implementation of Queues	
5	02/09/2026 - 02/15/2026	**Stacks** - Stacks functions (Push, Pop, Top, …) - Array implementation of stack - Linked list implementation of Stack - Stacks' applications (Function call stack, expression evaluation, infix to postfix and etc.)	Assignment 2: Linked Lists and Queues

6	02/16/2026 - 02/22/2026	**Recursion(review)** - Function Calls - Recursive implementation	2/13 No Classes Assignment 3: Stacks Project 1 : Stacks
7	02/23/2026 - 03/01/2026	**Binary Trees** - Binary Tree Traversals - Binary Search Trees	
8	03/02/2026 - 03/08/2026	**Binary Trees** - Insertion, Deletion - Recursive Implementation of BTs	(2/27 Tue)Midterm Exam Project 1 is due
9	03/09/2026 - 03/15/2026	**Binary Trees** - BST different functions and their complexity analysis Balanced BSTs (AVL Trees) - AVL Trees properties and definitions(Height, Balance factor, etc.) - AVL Trees insertion, Deletion and search functions	Assignment 4: BST Project 2 : BST
10	03/16/2026 - 03/22/2026	**Spring Break**	
11	03/23/2026 - 03/29/2026	**Heaps** - Priority Queues - Min/Max heap implementation - Heapify Algorithm(Percolate up/down functions) - Heap Sort - Complexity analysis of Heaps/Priority Queues implementations	
12	03/30/2026 - 04/05/2026	**Tries** - Implementation, applications and complexity analysis **Graphs** - Different Representations **Graphs algorithms** - BFS, DFS	
13	04/06/2026 - 04/12/2026	**Graphs algorithms** - Minimum Spanning Trees - Graph Coloring	Assignment 5: Graphs
14	04/13/2026 - 04/19/2026	**Sorting Algorithms** - Insertion sort, - Selection sort - Heap sort	Assignment 5
15	04/20/2026 - 04/26/2026	**Sorting Algorithms** - Quick sort - Merge sort **Hashing** - Hash Functions - Different types of hashing - Collision	Project 3: Team project
16	04/27/2026 - 04/28/2026	**Hashing** - Resolving Collisions - Open Addressing - Rehashing Final Exam	

I reserve the right to modify this schedule as required by the progression of the class.

Important Dates		
Jan 19	M	Martin Luther King Jr. Holiday - **No Classes**
Feb 10	T	Career Day – **No Classes**
March 16-20	M-F	Spring Break- **No Classes**
April 17	F	Withdrawal Without Academic Penalty Deadline (W assigned)
May 13	W	Final Grades Available Online

Course Policies

Attendance

- Students in face-to-face courses are expected to attend all of their scheduled University classes and to satisfy all academic objectives as defined by the instructor. (University Policy, FPU-5.0010AP) (see also University Policy).
- *A+ Attendance* will be used to track attendance.
- Exceptions to any attendance requirements may be made on a case-by-case basis.
- Note: Falsifying attendance for yourself or for another student is an act of academic dishonesty and is considered a violation of the university's academic integrity policy.

Participation

Students are expected to participate in the classroom experience. The use of earbuds/headphones during class is specifically not allowed and students who engage in this behavior may be asked to leave the class for the day (noting exceptions for authorized accommodations). In addition, students who routinely do not bring materials to class that are required for participation, will not be given credit for class attendance, and if this becomes a pattern of behavior, may be asked to leave the class for the day. Persistent problems with participation may result in a code of conduct referral.

Late Work/Make-up work

No late submissions are allowed for assignments, projects or quizzes. In general, there is no make-up for assignments, projects and quizzes. Make-up for a missed exam will be provided, given that an official excuse is presented.

Grading Scale

A	above 93%
A-	90% - 92%
B+	87% - 89%
B	83% - 86%
B-	80% - 82%
C+	77% - 79%
C	73% - 76%
C-	70% - 72%
D+	67% - 69%
D	63% - 66%
D-	60% - 62%
F	below 60%

Assignment/Evaluation Methods

Assignment	**Percentage**
Projects	20%

Homework Assignments	20%
Midterm Exam	20%
Final Exam	20%
Quizzes	15%
Participation	5%
Total:	100%

- **Homework Assignments:** There will be several assignments and they will be posted on Canvas.
- **Projects:** There will be several projects (programming assignments) and they will be posted on Canvas.
- **Quizzes:** There will be multiple quizzes during the semester. All quizzes are pop up quizzes.
- **Participation:** It is important that you actively participate to learn the course subject.
- **Midterm Exam:** will test the subjects covered till mid semester.
- **Final Exam:** will test the subjects covered after Midterm Exam.

Civility and Collegiality

Faculty and students come to the university for the same reason, which is to participate in a highly professional educational environment. To that end, both students and faculty are expected to treat each other with mutual regard and civility. Communication, written, oral and behavioral, between faculty and students must remain respectful. Within and outside of the classroom, students must refrain from derogatory comments toward the faculty member and their fellow students, and faculty as well must refrain from derogatory comments toward their students. Faculty and students should address each other with respect, in accordance with the wishes of the faculty and the students: for example, no one should be addressed by their last name alone.

Faculty from the outset of a course can and should specify what constitutes activities and behavior that take away from, that diminish, the educational environment. An individual student's distracting behavior impedes the education of fellow students, which itself is a form of disrespect. Civility and collegiality also include respecting each other's time: for example, neither students nor faculty should arrive late to class (unless unforeseen, pressing circumstances prevail); faculty should be present at the posted office hours; and students and faculty should be punctual when meeting times are scheduled. In more general terms, collegiality means respecting the right of both faculty and students to participate fully and fairly in the educational enterprise.

University Policies

Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The University, through the Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations.

If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the ODS student portal and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive.
If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible.

The Office of Disability Services (ODS):
DisabilityServices@floridapoly.edu
(863) 874-8770
The Access Point
ODS website: www.floridapoly.edy/disability

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. You may speak to your professor, but your professors have an obligation to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discussion resources and options available.

Academic Integrity

The faculty and administration take academic integrity very seriously. Violations of academic integrity regulation include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in an academic integrity hearing and sanctions against the accused student if found in violation. Sanctions range from receiving a zero on the exam or assignment, to expulsion from the university. Repeat offenders are subject to more severe sanctions and penalties.

Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidently, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action).

*Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is **prohibited**.*

Sample Rubric for Homework and Lab Assignments

Programming assignments will be evaluated using rubrics similar to the one included below.

0%	**25%**	**50%**	**75%**	**100%**
Source code files were not provided. Problem solution was not submitted.	Significant assignment requirement ignored or violated. Program doesn't compile.	Output of the program was not shown. Lack of comments. Pour code readability (inconsistent indentation, variable naming, general organization)	Code uses a poorly chosen approach in at least one place, for example, hardcoding something that could be implemented through a for loop. Minor details of the program specification are violated.	Program works correctly and meets the requirements of the assignment. Code is clean, well-organized, and well commented.