

UNION COUNTY COLLEGE MASTER COURSE SYLLABUS

COURSE NUMBER & NAME: CST 261 – Data Structures

LECTURE/LAB HOURS 4 lecture hours per week

CREDITS 4 credits

PREREQUISITES: CST 162

COURSE DESCRIPTION: This course investigates abstract data types (ADTs), recursion, algorithms for searching and sorting, and basic algorithmic analysis using an object-oriented language. Data structures to be covered include, but not limited to strings, arrays, stacks, queues, trees, and heaps. Students also will explore the use of a variety of data structures and useful algorithms, such as searching and sorting, in the context of modeling and simulation.

COURSE LEARNING OUTCOMES:

Upon completion of this course, students should be able to:

- 1) Illustrate the basic concepts of various data structures, such as arrays, unsorted lists, sorted lists, stacks, queues, linked structures, binary trees, and binary search trees.
- 2) Apply object-oriented methods of data abstraction, encapsulation, inheritance, polymorphism to computer programming.
- 3) Differentiate between recursive computer programming and iterative computer programming.
- 4) Construct computer programs in a high-level programming language using an integrated development environment (IDE), which includes an editor, compiler, and debugger.
- 5) Create computer programs using a high-level programming language that implement file stream input and output (I/O).
- 6) Create computer programs using a high-level programming language that implement Abstract Data Types (ADT).

REQUIRED COURSE MATERIALS:

- 1) *Data Structures Essentials with Java* zyLabs subscription available from [zyBooks.com](https://zybooks.com).

REQUIRED COMPUTING MATERIALS:

- ✓ Union County College email address required for zyBook subscription
- ✓ Internet access to login to the Canvas LMS
(available in UCC computing labs, libraries, and WiFi network)
- ✓ USB drive or cloud storage, such as Microsoft OneDrive or Google Drive, to save all assignments. It is important to save all work until your final grade has been received.

LOCATION, MEETING DAYS & TIMES:

- ✓ TBD

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COURSE REQUIREMENTS:

- ❖ Consistent class attendance and participation.
- ❖ Successful completion of all homework and programming assignments.
- ❖ Successful completion of all quizzes, semester and final examinations.

Union County College does not discriminate and prohibits discrimination, as required by state and/or federal law, in all programs and activities, including employment and access to its career and technical programs.

Experiential Learning:

Students must complete an experiential learning activity that connects course content to career applications. This activity may be a content specific assignment or practical skill that is applied within a course assignment. This assignment supports the general education learning outcomes of scientific/critical thinking and quantitative reasoning; oral and written communication; and information literacy/technological competency.

Americans with Disabilities Act (ADA):

Union County College offers reasonable accommodations and/or services to persons with disabilities. Any student who has a documented disability and wishes to self-identify should contact the Coordinator of Disability Support Services at (908) 709-7164, or email disabilitysvc@ucc.edu. Accommodations are individualized and in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1992. In order to receive accommodations, students must be registered with Disability Support Services. Students should register with the office as soon as possible. Accommodations are not official until the Faculty Accommodations Alert Form(s) are issued from the student to his/her instructor(s).

Family Educational Rights and Privacy Act (FERPA):

The FERPA Statement can be found at <https://www.ucc.edu/admissions/the-family-education-rights-and-privacy-act/>

An essential element of this course includes information literacy. “Information Literacy” is the evaluation and assessment of integrated information. An understanding of its ramifications and implications through the critical use of information literacy will be included. Students must be able to locate, discern, and effectively use information to solve issues and/or problems.

EVALUATION METHODS:

Review Questions (RQ, Canvas)	15%
zyBooks Activities	15%

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Programming Assignments	20%
Semester Exams	20%
Final Exam	20%
Class attendance & participation	10%

COLLEGE GRADING SCALE:

A	90 or above	C	70-76
B+	87-89	D+	67-69
B	80-86	D	60-66
C+	77-79	F	below 60

LAST DATE TO WITHDRAWAL: TBD

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ATTENDANCE POLICY:

Your participation in this course is very important to your success. In fact, 10% of your final semester grade is based on your attendance and class participation.

INCOMPLETE POLICY:

Students will not be given an incomplete grade in the course without sound reason and documented evidence as described in the Student Handbook. In any case, for a student to receive an incomplete, he or she must be passing and must have completed a significant portion of the course.

ACADEMIC INTEGRITY POLICY:

Students are expected to uphold the College's standard of conduct relating to academic honesty. Students assume full responsibility for the content and integrity of the academic work they submit. The guiding principle of academic integrity shall be that a student's submitted work, quizzes, examinations, reports, and projects must be that of the student's own work. Any student violating the College's policy on academic integrity is subject to receive a failing grade for the course and may be subject to disciplinary action as described in the Student Handbook.

For this programming class, it is permissible to assist classmates in general discussions of computing techniques. General advice and interaction are encouraged. Each person, however, must develop his or her own solutions to the assigned homework and laboratory exercises. A student may NOT use or copy (by any means) another's work (or portions of it) and represent it as his or her own. If you need help ask me, your professor.

UNION COUNTY COLLEGE MISSION STATEMENT:

Transforming Our Community...One Student at a Time

UNION COUNTY COLLEGE MASTER COURSE SYLLABUS

Instructor Information:

Email:

Office Phone:

Office Location:

Office Hours:

COURSE SCHEDULE: (check Canvas course throughout the semester for possible adjustments)

Unit/Content	Estimated Week	Readings & Assignments
Course Introduction Review LMS	1	Review course syllabus. Purchase required zyBooks subscription. Logon to Canvas.
Searching Algorithms	2	zyBooks, Introduction to searching; Review questions
Linear search	3	zyBooks, Linear search algorithm; programming assignment
Binary Search and Big-O Notation	4	zyBooks, Binary search algorithm; programming assignment
Sorting Algorithms	5	zyBooks, Sorting algorithms; programming assignment
Exam: Searching and Sorting Algorithms	6	
List data structure	7	zyBooks, Lists; programming assignment.
Linked List data structure	8	zyBooks, Lists; programming assignment; Review questions
Queue data structure	9	zyBooks, Queues; programming assignment.
Stack data structure	10	zyBooks, Stacks; programming assignment.
Exam: Data Structures	11	
Hash tables and linear probing	12	zyBooks, Hash tables; Review questions
Binary trees	13	zyBooks, Binary trees; programming assignment
Graphs and heaps	14	zyBooks, Graphs; Review questions
Final Exam	15	

NOTE: The instructor reserves the right to modify the course requirements, assignments, grading procedures and other related policies as circumstances may dictate during the semester.