



# SYLLABUS - CSE 222

## DATA STRUCTURES

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### Course Information

**Description:** Fundamentals of data structures and advanced programming techniques used in high-level languages such as C.

**Topics:** Linked lists, trees, heaps, hash tables, sorting, searching, recursion and algorithm analysis.

**Prerequisite:** A grade of C or better in CSE 121 and CSE 224 or consent of instructional unit.

**Credits:** 5

**Class hours/location, instructor information and other important details:** See "Additional Information" in Canvas for section-specific details.

### Text and Materials Needed:

**Required Text:** Open Data Structures, by Pat Morin, available for free at [www.engr.cs.com/courses/cse222/cse222text.pdf](http://www.engr.cs.com/courses/cse222/cse222text.pdf)

#### Recommended Texts:

- Introduction to Algorithms, Third Edition, by Cormen, ISBN-10: 0262033844 ISBN-13: 978-0262033848 Published by MIT Press
- C Primer Plus, 5th Edition, by Prata, ISBN-10:0-672-32696-5, Published by Sams Publishing
- A Practical Guide to Linux Commands, Editors, and Shell Programming, 2/E, by Sobell ISBN-10:0131367366 Published by Prentice Hall

**Required Supplies/Materials:** Access to CTEC; alternative C/Linux access (Cygwin, Ubuntu, etc.) will also be helpful, but is not necessary.

### Course Outcomes

OUTCOMES	ASSESSMENT	SUPPORTED PROGRAMS
Be familiar with common Abstract Data Types, their applications, and typical algorithms and data structures used in implementation.	Computer-assignments In-class assignments Tests	AST2-A
Select and implement fundamental algorithms and data structures such as Ordered Collections, Queues,	Computer-assignments In-class assignments Tests	AST2-A&C



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Stacks, Directed Graphs, Trees, Hash Tables, Linked Lists.		
Design, code, test and debug recursive functions; Compare and contrast recursion with iterative strategies.	Computer-assignments In-class assignments Tests	AST2-B&C
Analyze and contrast fundamental sorting and searching algorithms with respect to execution time and memory requirements.	Computer-assignments In-class assignments Tests	AST2-A
Demonstrate the ability to work effectively in a team.	Group-assignment In-class assignments	AST2-C

### Course Policies

**Academic Honesty and Plagiarism:** You are expected to do your own work. Copying or rewriting someone else's online or offline work, having someone else do your work, or cheating in any fashion will result in zero point for that test or assignment in addition to penalties prescribed by college policies. A second offense will result in an automatic 'F' for the class. **If you are in doubt as to what constitutes cheating, as your instructor for further clarification.**

**Late Paper/Assignment Policy:** Points are only awarded for tests, quizzes, assignments and projects that are completed and delivered on the assigned due dates and times. In all other instances, zero points will be awarded unless the student has made prior arrangements with the instructor.

**Missed Exam/Assignment Policy:** Points are only awarded for tests, quizzes, assignments and projects that are completed and delivered on the assigned due dates and times. In all other instances, zero points will be awarded unless the student has made prior arrangements with the instructor.

**Computer or Equipment Misuse:** Students are expected to obey the Equipment and Computer Usage Guidelines. Students who misuse the equipment or computers will be expelled from the class and/or lab.



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### Support Services

**ADA Accommodations:** If you have emergency medical information, which should be shared, or if you require assistance in case the building should be evacuated, please make an appointment to see your instructor as soon as possible. Any student with a disability who may require accommodation in order to fully participate in this class should contact the Disability Support Services Office at (360) 992-2314 or (360) 991-0901 (VP) or stop by GHL 137.

### College-Wide Policies

**Non-discrimination Policy:** Clark College affirms a commitment to freedom from discrimination for all members of the college community. The college expressly prohibits discrimination against any person on the basis of: Race, color, national origin, disabled veteran status, sex, sexual orientation, age, gender identity, creed, gender expression, Vietnam-era veteran status, religion, marital status, and presence of physical, sensory or mental disability. The responsibility for, and the protection of, this commitment extend to students, faculty, administration, staff, contractors, and those who develop or participate in college programs. It encompasses every aspect of employment and every student and community activity.

### Additional Information

All grades are posted on Canvas, along with additional details on exams, assignments, etc.



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### Tentative Schedule

The following is subject to change. See Canvas for the detailed list of assignments, exact dates for exams, and other details.

**Week 1:** Introduction to the course and to data structures; C struct statement; pass by value vs. pass by reference; pointers to structures; malloc() and free(); arrays of structures; linked lists; doubly linked lists

Project #1 due (warm-up: pointers to structs, arrays of pointers, passing structs by reference)

**Week 2:** Stacks and queues. Order of complexity  $O()$

Project #2 due (linked lists)

**Week 3:** Recursion; Binary trees; Tree traversal

Project #3 due (stacks and queues)

**Week 4:** More binary trees; Balanced binary trees; B-trees

Project #4 due (binary trees)

**Week 5:** Tries; Hashes

Project #5 due (binary tree deletion)

**Week 6:** Stacks and Queues;heaps

Project #6 due (hashes)

**Week 7:** Introduction to Algorithms: Sorting and searching

Project #7 due (sorting)

**Week 8:** More sorting and searching

Project #8 due (searching)



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**Week 9:** Graphs; depth- vs breadth-first traversals; Traveling Salesperson (TS) problems

Project #9 due (TS problem)

**Week 10:** Abstract Data Types; advanced topics and wrap-up; final review.

**Week 11: Final Exam** (cumulative)

### Student Conduct Guidelines

- **Be sure to read the "Additional Information" section of Canvas for important section-specific information about this course.**
- Come to every class, and arrive on time.
- Be an active participant in the class.
- Ask questions! All content-related questions are welcome.
- Use the resources available. Use the ctec server to try C features and functions – create prototypes – create “throw away” code.
- Get to know the students around you. Form study and work groups if possible.
- It is recommended to exchange ideas and work with peers. Note however that unless it is a team project, all assignments must be completed individually and independently.
- It is not all right to copy part or all of a program from the web and call it your own.
- Do all assigned work, and complete it on-time.

### Class Cancellation

In the event of bad weather conditions or other events, check the local radio & TV stations, newsflash or the Clark College website, to see if Clark College is delayed or closed:

[www.clark.edu](http://www.clark.edu)

### Engineering and Computer Science Course Policies

Visit [http://www.engrcs.com//courses/ECS\\_Course\\_Policies.pdf](http://www.engrcs.com//courses/ECS_Course_Policies.pdf) for additional information and supporting materials.