SYLLABUS - CSE 222

DATA STRUCTURES

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 **here**.

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 linux.engrcs.com; additional 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

Topics to be covered (other topics may be covered as well)

- struct statement, typedef, malloc, free, memory organization, pointers and pointer de-referencing, pass by value vs. pass by reference, pointers to structures (→), valgrind, arrays of structures, sizeof
- order of complexity, linked lists, sentinel nodes, circular and doubly-linked lists
- gdb
- object-oriented programming, abstract data types, information hiding, encapsulation, interfaces,
- stacks, queues, hashes
- trees, binary search trees, insertion, deletion, searching, recursion, tree traversals (LNR, LRN, NLR, breadth-first), use of stacks and queues for traversal, recursive algorithms for trees, height, depth, balance, N-way trees, tries, AVL trees, red/black trees
- sorting: bubble sort, insertion sort, selection sort, merge sort, quick sort, radix sort, heaps, heap sort
- graphs

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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.

Support Services

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 me as soon as possible.

Accommodations. Reasonable accommodations are available for students who have a documented disability. Disability Support Services (DSS) coordinates reasonable accommodations for students with disabilities and/or temporary health conditions (could include a temporary injury or pregnancy). Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Disability Support Services office as soon as possible to better ensure that accommodations are implemented in a timely manner. All accommodations must first be approved through Disability Support Services. Disability Support Services is located in PUB 013, which is on the lower level. For an appointment or information, please visit www.clark.edu/dss or contact 360-992-2314 (voice) or 360-991-0901 (video phone) or email dss@clark.edu. Once you have established accommodations with Disability Support Services, please contact me as soon as possible to discuss your needs in this course.

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.

Code of Student Conduct: See http://www.clark.edu/about/governance/policies-procedures/student_code.php for Clark College's Code of Student Conduct.

Additional Information

Be sure to read the "Additional Information" section of Canvas for important section-specific information about this course.

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

Engineering and Computer Science Course Policies

Visit ECS Course Policies for additional information and supporting materials.