ESSEX COUNTY COLLEGE
DEPARTMENT
COURSE OUTLINE

COURSE DESIGNATION: CSC 225
COURSE TITLE: DATA STRUCTURES

NUMBER OF CREDITS: 3

CONTACT HOURS: 4 LECTURE: 2 LAB: 2 OTHER (Specify):

PREREQUISITES: Grades of "C" or better in CSC 122 or placement
CONCURRENT COURSES: N/A
COREQUISITES: N/A

CATALOG DESCRIPTION: This course is designed to present the fundamentals of data structures from an object-oriented perspective. The course introduces students to the design and implementation of abstract data types using an object-oriented programming language. The course includes introduction to algorithm analysis, recursion, and internal and external sorting/searching methods. The fundamental concepts of inheritance and virtual functions are also examined. Students are required to complete a series of programming projects that demonstrate their understanding of lecture topics.

GENERAL EDUCATION GOALS: N/A

COURSE OBJECTIVES:

Upon successful completion of this course, students should be able to do the following:

1. construct object-oriented applications using ADT;
2. design applications, which implement various searching and sorting algorithms;
3. construct dynamic and static data structures within an application; and
4. apply the basic principles of object-oriented programming.

COURSE CONTENT OUTLINE:

Based on the suggested text book: Data Abstraction and Problem Solving with C++: Walls and Mirrors (7th edition) by Frank M. Carrano, Pearson, 2016.

Week (3 meetings @ 80 minutes)	**Topic/Chapter**
1 – 2	Data abstraction
3 – 4	Recursion Pointers, Polymorphism and Memory Allocation
	First Examination

Week (3 meetings @ 80 minutes)	Topic/Chapter
5 – 6	Linked-Based Implementation Recursion as a Problem Solving Technique
7 – 8	Stacks Exceptions
9 – 10	Lists & List Implementation Sorted Lists and Their Implementation
	Second Examination
11	Algorithm Efficiency Sorting Algorithms and Their Efficiency
12	Queues and Priority Queues
13	Trees & Tree Implementation
14	Heaps
15	Graphs
	Final Examination

NOTE: 10 or more programming projects are assigned on an ongoing basis throughout the semester to correspond to the topics being discussed in class. Roughly one programming project is due each week (with the exception of exam weeks).

METHODS OF INSTRUCTION:

(e.g., lecture, discussion, group projects, labs, role playing, demonstration/return demonstration, independent study, research project)

Instruction will consist of lectures, laboratory demonstrations and assignments, and programming examples.

COURSE REQUIREMENTS:

(e.g., minimum number of assignments, exams, papers, etc.)

All students are required to:

1. Maintain regular attendance and take part in class discussions.
2. Complete assigned homework and projects on time.
3. Take all exams as scheduled.

METHOD OF EVALUATION:

(Specific method required should be explicitly listed)

Final course grades will be computed as follows:

% of

Grading Components	final course grade
• Homework, class participation and attendance Students must practice skills on their own by doing homework to be able to master course objectives. Homework assignments relate to these objectives. Attendance and class participation are necessary for students to benefit from the guidance of the instructor.	10%
• **10 or more programming projects** (dates specified by the instructor) Programming projects will show evidence of the extent to which students meet course objectives. Students should show that they have synthesized a combination of concepts. (See page 6 for programming project guidelines.)	**35%**
• **2 or more Exams** Exams will provide evidence of the extent to which students have mastered course objectives.	**25%**
• **Final Exam** The same objectives apply as with exams, but it is anticipated that students will provide increased evidence of synthesizing a combination of concepts.	**30%**

NOTE: The instructor will provide specific weights, which lie in the above-given ranges, for each of the grading components at the beginning of the semester.

ACADEMIC INTEGRITY:

"Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the college. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the ECC community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at
http://www.essex.edu/academic-policies/
Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Student Affairs. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Student Life & Development at slade@essex.edu"

STUDENT CODE OF CONDUCT:

"The ECC Code of Student Conduct serves to protect the college community and its property from inappropriate behavior(s) that could result in physical or emotional harm. The college outlines inappropriate behavior(s) and provides steps of disciplinary action for students whose acts violate the standards of conduct set by the institution. It is our expectation that students will abide by the Code of Conduct that is found at
http://www.essex.edu/wp-content/uploads/2019/01/LifeLine-2019-2020.pdf
For more information, please contact the Student Life and Activities Office located in

the Clara E. Dasher Student Center, Room 101, (973) 877-3208."

DIFFERENTLY-ABLED SUPPORT SERVICES:

"Essex County College welcomes students with disabilities into all of the college's educational programs. It is the policy and practice of Essex County College to promote inclusive learning environments. If you have a documented disability, you may be eligible for reasonable accommodations in compliance with college policy, the Americans with Disabilities Act, Section 504 of the Rehabilitation Act, and/or the New Jersey Law Against Discrimination. Please note, students are not permitted to negotiate accommodations directly with Professors, Academic Chairpersons, and Deans. To request accommodations or assistance, please self-identify with the Coordinator of Differently-abled Support Services. The office is located in the Student Development and Counseling Office at the Main Campus in Room 4122-I, and on Tuesdays at the West Essex Campus, Advisement Center. Contact us by telephone at 973-877-3071 or by email at disability@essex.edu."

MEMORANDUM

TO: Dr. Charles Reid
Chair/College Curriculum Committee

FROM: Gwendolyn C. Slaton
Director/Library

DATE: May 15, 2019

RE: PROPOSED CHANGE IN COURSE: CSC 225 DATA STRUCTURES
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We have reviewed our collection and determined that it (check one)

[X] can

[ ] cannot

adequately support the requirements of the course/program .

The faculty of the department/division has reviewed the bibliography of our holdings and (check one):

[X] agree that the current collection is adequate

[ ] request that additional titles be purchased

At this time the library (check one)

[X] has

[ ] does not have

sufficient funds to purchase auxiliary materials. Sufficient funds are expected to be available during the ensuing academic year.