

CMP-233: DATA STRUCTURES AND ALGORITHMS

Time Stamp:

Tue Jun 11 2024 13:19:55 GMT-0500 (CDT)

Approval Path

- a. Sat, 01 Apr 2023 16:54:40 GMT
Colleen Bamford (cbamford): Approved for IT Chair
- b. Fri, 28 Apr 2023 18:32:35 GMT
Aslihan Cakmak (acakmak): Approved for BMET Dean
- c. Wed, 11 Oct 2023 16:53:55 GMT
Christine Kelly (ckelly): Approved for Curriculum Committee Chair
- d. Mon, 16 Oct 2023 12:36:18 GMT
Patrick Enright (penright): Rollback to IT Chair for VPAA
- e. Sat, 11 Nov 2023 18:42:41 GMT
Colleen Bamford (cbamford): Approved for IT Chair
- f. Sat, 11 Nov 2023 20:24:23 GMT
Aslihan Cakmak (acakmak): Approved for BMET Dean

History

- a. Aug 30, 2016 by mshepard

Date Submitted: Sat, 01 Apr 2023 16:42:39 GMT

Last approved: Tue, 30 Aug 2016 08:15:05 GMT

Last edit: Sat, 11 Nov 2023 18:42:27 GMT

Course Type:

Credit

Credit Type:

Institutional

Course Prefix:

CMP

Course Number:

233

Course Capacity:

20

General Education?

No

Department:

Information Technologies (IT)

Division:

School of Business, Mathematics, Engineering and Technologies

Course Title:

Data Structures and Algorithms

Abbreviated Course Title:

Data Structures & Algorithms

Effective Date:

Spring 2023

Credit Hours:**Lecture:** 3**Lab:** 0**Recitation:****Clinical:****Cooperative:****Studio:****TOTAL:** 3**Catalog Credits:**

3

Course Fee:

Yes

Catalog Course Description:

The course includes advanced computer science topics dealing with logical structures of data and the design and analysis of computer algorithms operating on these structures. The course concentrates on abstract data structures (ADTs) such as lists, queues, stacks, hash tables, dictionaries, and trees. Both iterative and recursive algorithms are explored with analysis of their efficiency for these ADTs. Problems and computer exercises implementing the above structures and techniques are assigned.

Catalog Prerequisites:

CMP-129 or equivalent and MAT-123 or higher

Crosslisted

No

Textbooks:

Title	Ed	Author(s)	Publisher	ISBN	Req/Rec
Data Structures and Abstractions with Java	current edition	Frank Carrano	Pearson		Required

Supplemental Materials:

A high capacity storage disk such as a USB drive.

Specialized equipment, supplies, facilities, for classes limited by enrollment or restricted by accreditation and/or equipment limitations:**(Information will be used to determine differential funding category.)**

This course requires specialized equipment with limited life cycle of one to five years. The equipment is expensive, subject to rapid obsolescence, and has high maintenance costs. The excess contact hours result from a catalog-stated requirement that students must spend additional time in a laboratory setting.

Course Content:**Topics**

Life cycle of software

Object oriented design

Abstraction

Information hiding

Recursion

ADTs: list, stack, queue, binary tree, binary search tree, dictionary, priority queue

Classes

Recursion

Processing ADTs recursively

Hashing

Sorting and Searching

Efficiency of algorithms and the big O notation

Statement of Course Learning Outcomes:**Learning Outcomes**

Use data abstraction and abstract data types (ADTs).

Demonstrate problem solving techniques using data abstraction and abstract data types (ADTs).

Analyze the operations of different ADTs such as lists, stacks, queues, dictionaries and trees.

Implement ADTs in an object-oriented programming language to solve a problem.

Use Big O notation to measure the efficiency of algorithms.

Analyze the use of iterative and recursive algorithms in ADTs.

Statement of Relation to Curriculum(s):

Required in the 2500 Computer Science

Required in the 3504 Game Development Option

Required in the 2501 Computer Science: Data Science option

Format for offering the course:**(check all that apply)**

Traditional

Hybrid-Main Campus

Virtual Campus

Key: 3124