A. Protocol

Course Name: Data Structures
Course Number: CSC 328
Credits: 3
Prerequisites: CSC 265 Object-Oriented Programming with C- or better

Maximum Class Size (face-to-face): 32
Maximum Class Size (online): N.A.

B. Objectives of the Course:
Upon completion of this course the student will be able to:

1) Discuss and illustrate the definition of a data structure.
2) Discuss the concepts of and write programs using pointers and linked lists.
3) Discuss, illustrate and write programs that use stacks, queues and trees.
4) Write functions that perform the basic stack, queue and binary tree operations.
5) Discuss the applications of specific data structures.
6) Introduce Big-Oh analysis.
7) Write programs to perform hash searches.
8) Discuss various hashing and collision resolution techniques.
9) Discuss various sorting algorithms.
10) Write large programs which exemplify good programming style, efficiency of code and proper documentation.
11) Discuss graphs as they relate to programming.

C. Catalog Description:
The design, use and programming of data structures such as stacks, queues, linked lists and binary trees will be discussed. Sorting and searching methods are also discussed in this course. The analysis of algorithms will be considered as well as the applications of the various data structures. Prerequisite: CSC 265 Object-Oriented Programming with C- or better. Three credits.

D. Outline of the Course:
1) Introduction to Data Structures
   a. Overview of data structures
   b. Definitions
   c. Initial examples
   d. Algorithm Analysis

2) Linked Lists
   a. Definition
   b. Implementation through dynamic storage allocation
   c. Implementation of lists through arrays
   d. Traversal
   e. Initialization and creation
   f. Insertion
   g. Deletion
   h. Multi-linked lists
3) Stacks
   a. Definition
   b. Operations (push, pop, initialization)
   c. Array implementation
   d. Linked list implementation
   e. Applications (postfix notation, subprogram calls, others)

4) Queues
   a. Definition
   b. Operations (insertion, deletion, initialization)
   c. Array implementation
   d. Linked list implementation
   e. Circular representation
   f. Applications (scheduling, others)

5) Searching Methods
   a. Hashing

6) Binary Trees
   a. Definition and terminology
   b. Searching
   c. Insertion
   d. Deletion
   e. Traversals (and use of traversals in sorting)
   f. Heaps

7) Sorting
   a. Techniques
   b. Radix, Shell, Quick, Heap and Merge sorts

8) Graphs
   a. Terminology
   b. Representation

E. Teaching Methodology:
   1) Traditional Classroom Methodology:
      This course will be taught using the lecture/discussion method and cooperative group
      method during appropriate sections of the course. Students will be expected to write fairly
      lengthy computer programs which implement the data structures studied. Class lectures
      will stress the design of algorithms.
   2) Online Methodology:
      This course will not be taught online.

F. Text
   Kelley/Pohl. C by Dissection
   ISBN 0201713748

G. Assessment Activities:
   1) Traditional Classroom Assessment
      The final grade will be determined as a percentage from the following evaluation methods
      with varying weights at the discretion of the instructor:
      a. Examinations
      b. Quizzes
      c. Assignments


d. Programs

e. Attendance

f. Performance

2) Online Assessment

No online assessments will be given.

H. Accommodations for Students with Disabilities:

Accommodations for Students with Disabilities

Students with disabilities:

- Reserve the right to decide when to self-identify and when to request accommodations.
- Will register with the Office for Students with Disabilities (OSD) each semester to receive accommodations.
- Might be required to communicate with faculty for accommodations, which specifically involve the faculty.
- Will present the OSD Accommodation Approval Notice to faculty when requesting accommodations that involve the faculty.

Requests for approval for reasonable accommodations should be directed to the Office for Students with Disabilities (OSD). Approved accommodations will be recorded on the OSD Accommodation Approval notice and provided to the student. Students are expected to adhere to OSD procedures for self-identifying, providing documentation and requesting accommodations in a timely manner.

Contact Information:

- Location: Azorsky Hall – Room 105
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