

48-0100

Action Date:

Approval Date:

Apr 4/19/19

# RESEARCH PLAN

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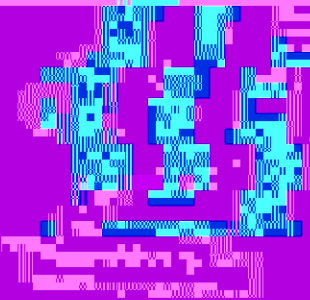
26. Appendix

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Program Director

Program Manager

Program Coordinator

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See Attachment A the new syllabus of record.

2. Summary of the proposed revision

The principal revision of course description and syllabus from COSC 310 Data Structures to COSC 310 *Data Structures and Algorithms* are contained in Attachment A, the new syllabus of record.

3. Justification of the revision

Since the department does not offer a separate course on Algorithm Analysis and Design, it is now necessary to revise and change the course contents of COSC 310 and rename it as *Data Structures and Algorithms*. Concepts of algorithms are essential for our students, who want to be software developers or programmers. Many colleges and

universities such as DePaul, University of Pittsburgh, James Madison University, VA, University of Illinois at

**NEW COSC 310 Syllabus of Record**

**Attachment A**  
**3 class hours**  
**0 lab hours**  
**3 semester hours**  
**3c-01-3sh**

**I. Catalog Description**

**COSC 310 Data Structures and Algorithms**

**Prerequisite: COSC 210**

4. Graphs

(6 hours)

b. graph traversals- depth-first and breadth-first search

c. greedy method- single-source shortest path and all-pairs shortest paths

d. Applications of graphs- spanning tree, minimum spanning tree

(Prim's and Kruskal's algorithms)  
e. graph algorithm efficiency analysis

VII. Bibliography:

1. [REDACTED]

2. [REDACTED]

I. Catalog Description

COSC 310 Data Structures and Algorithms 3 credits

Pre-requisite: COSC110

Basis concepts of data storage systems and structures: lists, arrays, strings, hashing techniques, searching and

sorting techniques; data structures in programming languages; string processing. Programming in an object

- f. circular lists and multi-lists
- g. implementations of linear objects using several actual data structures

3. Sorting (6 hours)

- a. elementary sorting techniques (exchange, selection, and insertion)
- b. recursion as a programming technique
- c. advanced sorting techniques (merge and quick)
- d. algorithm efficiency analysis (big O notation)

4. Hierarchical Data Structures (9 hours)

- a. general trees
- b. binary trees
- c. array and pointer implementations of binary trees
- d. preorder, postorder, inorder traversals

- f. heap sort
- g. other trees (AVL, b-trees, 2-3-trees)

5. Graphs (3 hours)

6. Hash tables (3 hours)

None - the needed resources are already in place.

Joseph Bergin, Data Abstraction, McGraw-Hill, 1994.

William Ford and William Topp, Data Structures with C++, Prentice Hall, 1995.

James F. Korsh and Leonard J. Garrett, Data Structures, Algorithms, and Programming Style using C, PWS-Kent, 1988.

Johnsonbaugh, Richard, and Kalin, Martin. Object-Oriented Programming in C++. Prentice Hall. 1995.