COURSE DESCRIPTION

Dept., Number	CSci 433	Course Title	Algorithm and Data Structure Analysis
Semester hours	3	Course Coordinator	Dawn E. Wilkins, Associate Professor

Current Catalog Description

Study of the design and analysis of algorithms and data structures. The topics include analysis techniques, sorting, searching, advanced data structures, graphs, string matching and NP-completeness.

Textbook

Richard Johnsonbaugh and Marcus Schaefer. *Algorithms*, Pearson/Prentice Hall, 2004, ISBN: 0-02-360692-4

References

Class website: http://www.cs.olemiss.edu/~dwilkins/CSCI433/spr08/CSCI433.html

Course Outcomes

Upon successful completion of this course, students:

1. understand data structures, including stacks, queues, trees and graphs,
2. are familiar with algorithmic techniques such as brute force, greedy, and divide and conquer,
3. can develop algorithms for reasonably difficult computational problems,
4. are able to reason about the efficiency and correctness of algorithms,
5. possess improved problem-solving skills,
6. are more proficient programmers.

Relationship between Course Outcomes and Program Outcomes

1. Understand data structures, including stacks, queues, trees and graphs. Outcomes (a), (c) and (j)
2. Be familiar with algorithmic techniques such as brute force, greedy, and divide and conquer. Outcomes (a), (c), (j) and (k)
3. Be able to develop algorithms for reasonably difficult computational problems. Outcomes (a), (c), (j) and (k)
4. Be able to reason about the efficiency and correctness of algorithms. Outcomes (a), (c),

(j) and (k)
5. Have improved problem-solving skills. Outcomes (a), (c) and (j)
6. Be more proficient programmers. Outcomes (a), (c), (j) and (k)

Prerequisites by Topic

The prerequisites are CSci 211 (Computer Science III) and Math 301 (Discrete Mathematics)

Major Topics Covered in the Course

- Algorithmic basics
- Analysis of algorithms
- Review of data structures
- Analysis of algorithms
- Searching
- Sorting
- Graphs
- Solution techniques
- Divide and conquer
- Greedy algorithms
- Text searching
- NP-completeness

Assessment Plan for the Course

A comprehensive, 30-question exam constructed by a faculty committee is administered to each offering of CSci 433. Student performance is analyzed question-by-question to identify needed adjustments in the topics, textbook, lectures, or assignments.

How Data in the Course are Used to Assess Program Outcomes (unless adequately covered already in the assessment discussion under Criterion 4)

Estimate Curriculum Category Content (Semester hours)

Area	Core	Advanced	Area	Core	Advanced
Data Structures		1	Algorithms		2