COSC 282 Data Structures and Algorithms — Syllabus

Administrative Details

- Number & Title: COSC 282 Data Structures and Algorithms
- Days & Rooms: MWF 9:10 - 10:10 F 243
- Instructor: Gene Rohrbaugh, PhD
- Email: grohrbau@messiah.edu <mailto:grohrbau@messiah.edu>
- Phone: Extension 2145
- Office Hours: Frey 123 | Spring 2010 | MWF 10:10 - 11:10 | R 2:00 - 2:50
- Website: www.tigerram.com <http://www.tigerram.com>

Course Description

Catalog:

Data and procedural abstraction for larger programs. Using the Java language for programming, topics include analysis of algorithms, strings, linked lists, queues, trees, and networks. Applications include simulations, parsing, searching, sorting, and others.

Prerequisites:

COSC 182 Programming II

Topics:

Arrays, Simple Sorting, Stacks and Queues, Linked Lists, Recursion, Advanced Sorting, Binary Trees, Red-Black trees, Heaps, Graphs, and Weighted Graphs.

Textbook:

Lafore, R. 2003 *Data Structures and Algorithms in Java (Second Ed).* Sams Publishing ISBN: 0-672-32453-9

Learning Objectives

Students who successfully complete this course will be able to:

- design and implement Java applications, both individually and as a member of a team
- propose and implement appropriate data structures and algorithms for specific problems.
- evaluate alternative data structures and algorithms for a given problem.
- implement these data structures and algorithms in a modern programming language (Java)
- analyze the time complexity of recursive and iterative algorithms and express that complexity using Big-O notation
- classify the performance of an algorithm based on empirical data
- design and implement empirical tests for program efficiency

- produce thorough, accurate, and concise internal and external documentation for computer programs

Grading

- 35% exams and quizzes (at a minimum, there will be a midterm and a comprehensive final)
- 45% homework assignments
- 10% semester project (programming)
- 10% preparation & participation

A ≥ 93		A- ≥ 90
B+ ≥ 87	B ≥ 83	B- ≥ 80
C+ ≥ 77	C ≥ 73	C- ≥ 70
D+ ≥ 67	D ≥ 60	
F < 60		

Expectations

Attendance

Regular attendance and active participation is crucial to your success in this class. In part, this is because we will devote the majority of the class time to the most important and challenging course topics. The best way to master the material is in the context of a learning community — interacting with peers and with the instructor on a regular basis. Sometimes you will find you can contribute to the collective understanding; sometimes you will benefit from what others have to share. In your education at Messiah College, you should aspire to more than mere technical mastery of the material. If you miss class for any reason, speak to a fellow student to find out what was covered in class that day. *Participation* refers to factors such as timeliness, attitude, engagement, initiative, collaboration, and attentiveness. *Preparation* refers to completion of reading and other assignments before class on the day they are due.

Timeliness

All assignments must be completed and submitted before the due date. Any student who falls behind in reading or other assignments can no longer actively participate in the daily learning activities of the course, to the detriment of everyone. To make allowance for unforseen circumstances, each student may submit up to three assignments late during the semester, with the following penalties: within the first 24 hours after the due date, a 10% reduction in points; within the next 24 hours, with a 25% reduction in points. After 48 hours, no assignments will be accepted. Once a student has received credit for three late assignments, no further late assignments can be

submitted.

Communication

Messiah College email will be used for official communication relating to the class. In order to avoid missing important messages, please check your Messiah email at least once a day Monday-Friday. Any email you send me MUST have a subject line that identifies the course and the specific subject of your inquiry (examples: "COSC282 linked list homework due 2/15," "COSC171 question on class lecture for 2/22," "ENGL230 absence on 3/5 due to family emergency") Email sent without a subject line or with a generic subject line will be treated as SPAM (examples: "today's homework," "question for you," "missing class").

Assignments

All assignments are to be submitted in accordance with the instructions provided. Assignments that call for electronic copies must submitted be via Sakai -- no emailed work will be accepted. Assignments that call for hard copies must be submitted at the beginning of class on the due date -- after class begins, no work will be accepted.

Collaboration

In general, it is a good idea to complete learning activities with other students. Unless I specify otherwise, you are encouraged to work collaboratively, with the following provisions: (1) share ideas and thought processes, but not answers; (2) turn in your own individual submission; (3) indicate any such collaboration. Unless explicitly instructed to, NEVER SHARE CODE with another student, even after you have completed the class. Doing so is a violation of academic integrity, and could result in sever penalties, both to the other student and to you EVEN AFTER YOU'VE COMPLETED THE CLASS.

When collaboration is explicitly called for, each student will be asked to evaluate the participation of her/his peers. Make sure your contribution to the project is sufficient.

Academic Integrity

Academic integrity is taken very seriously. Violations will result in severe consequences, including failing the course. For a complete policy, see the current Student Handbook. Violations include (but are not limited to):

Plagiarism: Examples: failing to cite a reference, failing to use quotation marks where appropriate, misrepresenting another’s work as your own.

Cheating: Attempting to use or using unauthorized material or study aids for personal assistance in examinations or other academic work. Examples: using a cheat sheet, altering a graded exam, looking at a peer’s exam.

Fabrication: Submitting altered or contrived information. Examples: falsifying sources and/or data, etc.

Facilitating Academic Dishonesty: Examples: working together on an assignment where collaboration is not allowed, doing work for another student, allowing one's own work to be copied.

ADA

Messiah College welcomes students with disabilities. If you have a documented disability and wish to discuss needed academic accommodations for this specific course, please speak with the instructor within the first week of class (or within the first week following the documentation of your disability). Campus policy states that disability accommodations must be pre-approved through the Office of Disability Services, located in Hoffman 101/102 (extension 5382).

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