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Fall 9-1-2015

### CSCI 232.00: Data Structures and Algorithms

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**Instructor:** Yolanda Reimer

**Office location:** SS 416

**Office hours:** Monday 2-4pm; Wednesday 10:30am-12; & by appt.

**Email:** [reimer@cs.umt.edu](mailto:reimer@cs.umt.edu)

**Course Website:** Moodle (<http://umonline.umt.edu>)

### Texts:

1. (Required) Miller, B., and & Ranum, D. (2011). *Problem Solving with Algorithms and Data Structures using Python (2<sup>nd</sup> edition)*. Franklin, Beedle & Associates.
2. (Optional) Any good book on Python programming. (e.g., *Python Programming: An Introduction to Computer Science 2<sup>nd</sup> edition*, 2010. Franklin, Beedle & Associates.)

You may also find the following Web resources useful:

- <http://www.python.org/>
- <http://www.codecademy.com/tracks/python>

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### Objectives

A data structures course is the gateway to the rest of the computer science curriculum. In this class you will take the first significant steps from “programming” to “computer science.”

- Extending knowledge of one programming language to learn another, is common among computer scientists. You will leverage your knowledge of Java and your ability to access and utilize Web resources to learn the **Python** programming language.
- Every computer scientist must be familiar with the **standard “toolbox”** of data structures (stacks, queues, linked lists, trees, heaps, etc). You will learn what these are, how to code/extend them, and be able to choose the appropriate one for the task at hand.
- You will learn the mathematical tools needed to **analyze the correctness and efficiency** of algorithms and data structure implementations.

### Prerequisites

The prerequisites for this class are CSCI 136; M 225 (coreq); or consent of instructor. Note that if you are able to take this class without the necessary prerequisites, you do so at your own risk. The instructor is not responsible for getting you up-to-speed on knowledge or skills covered in the prerequisite or co-requisite classes.

### Rough Schedule, subject to change

- Python fundamentals [2.5 weeks]
- Algorithm analysis [1 week]
- Stacks, Queues, Deques, Lists [3 weeks]
- Recursion [1 week]
- Searching & Sorting [3 weeks]
- Trees [2 weeks]
- Graphs [2 weeks]

## Evaluation & Grading

**35%: Lab work:** Most weeks will include *lab assignments*. The lab assignments will test your understanding of the concepts introduced in class and in your text, but may also involve learning new materials as a team or independently.

**35%: Projects:** There will be approximately 4 or 5 individual projects given throughout the semester. These will be slightly more open-ended and will typically require implementation of some sort.

**30%: Exams:** There will be two exams given during the semester (weeks 7 & 14).

### Important Dates not to be missed

The two in-class exams will be given during your assigned lab period on 10/16 and 12/4. I am unable to offer alternate dates and times for these special exam periods, so please mark your calendar now and make sure that you will be able to attend those classes. If you miss an exam without prior approval from the instructor or required documentation, you will receive a score of 0.

### Late Assignments Policy

- Late **lab assignments** will **NOT** be accepted. One reason for this is that we will often post solution keys soon after the due date.
- Late **projects** are subject to a **20% per day penalty**, including weekends. Late projects will **NOT** be accepted once solutions are handed out.
- There are no exceptions to this late policy without prior approval and documentation deemed acceptable to the instructor.

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### Additional class policies and information:

- I expect you to come to class (including lab). While I do not officially take attendance in this class, I do notice who is there consistently and who is not. In my years of teaching, I have seen that class attendance and grades are often correlated in the sense that those students who come to class tend to do better than those who do not.
- If you miss a class, you and you alone are responsible for the material covered. This includes handouts, schedule changes, and lecture notes. Do not expect me to reiterate a class period that you missed, and please, don't ask me if you've "missed anything important" – everything we do in class is important, so the answer is always "Yes!"
- Key dates for various autumn term activities/deadlines, including adding and dropping a course, can be accessed at: [http://archive.umt.edu/catalog/14\\_15/academics/academic-policy-procedure.php](http://archive.umt.edu/catalog/14_15/academics/academic-policy-procedure.php)
- Review the University policy on **incompletes** (see link above). In particular, note that incompletes can only be assigned when the student has "been in attendance and doing passing work up to three weeks before the end of the semester." Incompletes will not be issued simply to prevent a failing grade.
- All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at [http://www.umt.edu/vpsa/policies/student\\_conduct.php](http://www.umt.edu/vpsa/policies/student_conduct.php)
- Students with disabilities will receive reasonable modifications in this course. Your responsibilities are to request them from me with sufficient advance notice, and to be prepared to provide verification of disability and its impact from Disability Services for Students. Please speak with me after class or during my office hours to discuss the details. For more information, visit the Disability Services for Students website at <http://www.umt.edu/disability>.

Questions? Email [reimer@cs.umt.edu](mailto:reimer@cs.umt.edu)