## CSIS 2226: Foundations of Computer Science Spring 2014 Syllabus

**Instructor:** Dr. Vincent Cicirello **Office:** G-116

**E-mail:** Please use the course Blackboard mail **Phone (office):** 609-626-3526

**Office Hours:** Monday/Wednesday: 12:30-2:00pm (available other times by appointment)

Or, feel free to drop-in any time I'm in my office (if I'm there, I'd be happy to talk to you).

Course Time and Location: MWF 2:10-3:25, G108

Course Description: This course will review and build upon the major concepts introduced in MATH 2225 and examine additional mathematical topics needed for the study of computer and information science. A principal goal is the development of the ability to think mathematically about computer science problems and their solutions. Computer-based exercises using the Python language will provide students with additional experience with logic, induction and other methods of mathematical proof, and algorithms. Students will also learn to formulate conjectures and investigate possible answers through computational experiments in Python. Applications studied may include the verification of algorithms, the formal specification of software systems, semantics of programming languages, automata, circuit design, and parallel computing.

Q1 (Quantitative Reasoning Intensive): This is a math course. Sometimes informally referred to as "Discrete Math 2."

**Course Objectives:** The objectives of the course include:

- Gaining knowledge of applied discrete mathematics including the field's terminology and methods, and in particular in relationship to computer science (**IDEA Objective 1**).
- Learning the fundamental principles and theories of discrete mathematics and how they apply to computer science and information systems (**IDEA Objective 2**).
- Learning to apply topics of discrete mathematics to solving computer science problems (**IDEA Objective 3**).

CSIS Program Learning Outcomes: This course enables working toward achieving the CSIS Program outcomes:

- Outcome 1.1: Graduates will be able to implement a working program in a modern programming language.
- Outcome 1.2: Graduates will demonstrate an understanding of factual knowledge of computing terminology.
- Outcome 2.2: Graduates will develop an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.

**Prerequisites:** MATH 2225 with a grade of C or better or MATH 3325.

## **Required Textbooks:**

- Discrete Mathematics and Its Applications (7th Edition), by K. H. Rosen, ISBN: 0-07-338309-0.
- Python: Visual Quickstart Guide (3rd Edition), by T. Donaldson, ISBN: 0-321-92955-1.

## **Other Requirements:**

- Either one of these:
  - o Python 3.3.3. Can be downloaded from: http://www.python.org/
  - o Portable Python 3.2.5.1 (can be installed on a USB drive): http://portablepython.com/wiki/Download/
- Blackboard will be used for all e-mail correspondence regarding this course. Any e-mail that I may send regarding assignments, tests, etc will be via Blackboard. All assignment details will be posted in Blackboard. Some assignments will be submitted via Blackboard.

**Grading:** Exams (3) 48% (16% each)

Homework assignments / Problem sets 48% Participation 4%

**Grading Scale:** (Curves are possible and will be determined once the course is complete.)

A (at least 90.00)	A- (at least 89.00)	B+ (at least 88.00)
B (at least 80.00)	B- (at least 79.00)	C+ (at least 78.00)
C (at least 70.00)	C- (at least 69.00)	D+ (at least 68.00)
D (at least 60.00)	D- (at least 59.00)	F (less than 59.00)

Academic Honesty: Please familiarize yourself with Stockton's policy on academic honesty. All violations (including first violations) will result in a grade of F for the course. Stockton's policy on academic honesty does not allow withdrawing from a course to avoid a penalty for violating the academic honesty policy. Examples of violations include but are not limited to the following: cheating on an exam such as using an unauthorized resource or copying from another student, cheating on a homework assignment, any form of claiming the work of another as your own, helping someone violate the academic honesty policy such as helping someone cheat or allowing someone to copy your work, asking someone to help you violate the academic honesty policy even if they refuse to do so, etc.

**Exams:** Exam 1 will cover material from the beginning of class until exam day. Exam 2 will cover material after Exam 1 and up to Exam 2. Exam 3 will cover material after Exam 2 up until the day of Exam 3. The exams will be closed book and closed notes; however, you will be allowed 1 sheet of notes (on paper no larger than 8.5" by 11"). **A calculator may also be used during exams.** "Other aids" that are not allowed include cell phones (not even for calculator purposes), pagers, PDAs, and other communications devices.

**Make-Up Exams:** Make-up exams in general will not be given (i.e., if you miss an exam, you get a 0) with the following exceptions:

- 1) Documented medical excuse: please provide a doctor's note on the first class you return to after the missed exam.
- 2) Other institutional excuses: Situations may arise related specifically to Stockton that prevents you from being able to attend an exam. In most such cases, you should be aware of the conflict beforehand. Thus, I must be notified of this conflict one week prior to the missed exam. Send me e-mail via Blackboard with the details of the planned absence and provide written documentation (e.g., note from Stockton sports coach, note from faculty member sponsoring a field trip, etc).

Homework Assignments / Problem Sets: A significant part of your grade in this class comes from performance on homework assignments. The type of homework assignment will vary. Some will involve programming in Python or some other mathematically-oriented programming language covered in the course. No prior experience with Python is necessary. Other homework assignments will consist of sets of problems pertaining to the course topics. Most homework assignments are to be worked on individually. There are a small number of assignments for which I will allow you to work in small groups. I will provide details of this for the assignments in question.

**Due Dates:** Depending on the nature of the homework assignment, they will either be due: (a) at the beginning of a class session; or (b) electronically via Blackboard for assignments involving Python, or some other computing system. Any assignment that is due strictly electronically will be due by midnight on the date due. Most problem sets will be due by classtime on the date due (even if I give you the option to submit electronically). Late assignments will be penalized by 50% of the grade that would have been obtained if submitted on time, but will not be accepted if more than 1 week late. **The first time you are late with an assignment, if less than a week late, I will waive the late penalty (first time late only).** 

**Participation:** A small portion of your overall grade will come from participation (4%). This will include general participation elements such as contributing to class discussion, etc. To receive the full 4%, you must hand in all homework assignments on time; fully participate in all in class exercises, especially any lab exercises I may assign. You must also avoid distracting behavior, such as (but not limited to) sleeping in class (unless it's not a distraction, but it typically is), noisily entering (or leaving) while class is in progress, answering or making phone calls, playing games (unless it's a course activity), etc.

**Incomplete Policy:** In general, no grades of incomplete will be given. The only exception to this rule is an institutionally documented medical emergency that necessitates your complete absence from Stockton for a period greater than two continuous semester weeks. Additionally, you must be caught up on all work up to the point where your medical emergency began and currently in the "C" range or better overall at the point where the emergency began.

## Tentative Schedule: (This is Approximate and is Subject to Change)

This schedule is subject to change. Changes will be announced via Blackboard (and in class). If tentative exam dates change, they will be announced at least one week prior.

Date	Text and Topic	
January 22	Introduction and Overview	
24	Review of Sets and Functions (Chapter 2: 2.1, 2.2, 2.3, 2.5)	
27	Review of Sets and Functions (Chapter 2: 2.1, 2.2, 2.3, 2.5)  Review of Sets and Functions (Chapter 2: 2.1, 2.2, 2.3, 2.5)	
29	Review of Sets and Functions (Chapter 2: 2.1, 2.2, 2.3, 2.5)  Review of Sets and Functions (Chapter 2: 2.1, 2.2, 2.3, 2.5)	
31	The Python language (various chapters in Python book)	
February 3	The Python language (various chapters in Python book)	
5	The Python language (various chapters in Python book)	
7	Combinatorial Optimization (supplements, not in textbook)	
10	Combinatorial Optimization (supplements, not in textbook)	
12	Combinatorial Optimization (supplements, not in textbook)	
14	Combinatorial Optimization (supplements, not in textbook)	
17	Slack and/or Review for Exam	
19	EXAM 1	
21	Boolean Algebra, Logic Gates, and Circuits (Chapter 12)	
24	Boolean Algebra, Logic Gates, and Circuits (Chapter 12)	
26	Boolean Algebra, Logic Gates, and Circuits (Chapter 12)	
28	Boolean Algebra, Logic Gates, and Circuits (Chapter 12)	
March 3	Boolean Algebra, Logic Gates, and Circuits (Chapter 12)	
5	Algorithms, Growth of Functions, and Complexity of Algorithms (Chapter 3)	
7	Algorithms, Growth of Functions, and Complexity of Algorithms (Chapter 3)	
10	NO CLASS: Spring Break	
12	NO CLASS: Spring Break	
14	NO CLASS: Spring Break	
17	Algorithms, Growth of Functions, and Complexity of Algorithms (Chapter 3)	
19	Review of Induction and Recursion (Chapter 5)	
21	Recursive Algorithms (Section 5.4)	
24	Program Correctness (Section 5.5)	
26	Slack and/or Review for Exam	
28	EXAM 2	
31	Graphs (Chapter 10)	
April 2	NO CLASS: Preceptorial Advising Day	
4	Graphs (Chapter 10)	
7	Graphs (Chapter 10)	
9	Graphs (Chapter 10)	
11	Relations (Chapter 9)	
14	Relations (Chapter 9)	
16	Relations (Chapter 9)	
18	Trees (Chapter 11)	
23	Trees (Chapter 11)	
25	Trees (Chapter 11)	
28	Trees (Chapter 11) Slack and/or Review for Exam	
30	NO CLASS (Modified Class Schedule)	
May 2	EXAM 3: 2:30 – 5:00 (Modified Class Schedule)	
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