**CSC 304 Section A**

**Computer Science I**

**Fall 2016**

# Instructor Information

* Dr. Dorian P. Yeager, 121 ASC, email dorian\_yeager@georgetowncollege.edu.
* Office Hours: TR 11:00 – 11:50 am, 5:00 – 5:50 pm.

# Course Description

Study of algorithms such as advanced searching and sorting algorithms, graph and numerical algorithms, hashing, pattern matching, and others. Complexity and recursion. Prerequisites: CSC215.

# Text and Materials

*Problem Solving with Algorithms and Data Structures using Python*, by Brad Miller and David Ranum. Accessible via <http://interactivepython.org/runestone/static/pythonds/index.html>.

In-class notes may provide additional information which is testable, and may make reference to additional (readily-available) sources.

# Course Objectives

* To understand, define, and properly use the computer science terms associated with the study of algorithms and data structures.
* To recognize by name and informally describe the purpose and performance characteristics of some of the more important algorithms
* To translate algorithms into Python programs and successfully debug, execute, and test those programs with carefully designed data, interpreting the results in the light of the algorithm’s performance characteristics
* To properly interpret graphical illustrations of the performance of major algorithms
* To describe the meaning of “big-O” notation, and to analyze algorithms in terms of their order-of-magnitude complexity
* To describe the commonly employed complexity functions and to describe the difference between polynomial and non-polynomial complexity
* To understand the problem of NP-completeness and to be able to appreciate its significance

# Course Requirements

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| **Percentage Range** | **Letter Grade** |
| 92.5% - 100% | A |
| 87.5% - 92.4% | AB |
| 82.5% - 87.4% | B |
| 77.5% - 82.4% | BC |
| 70% - 77.4% | C |
| 60% - 69.9% | D |
| Below 60% | F |

Your grade will be determined by your scores on homework (25%), two in-class exams (15% each), a group project (20%), and the final exam (25%). The resulting percentage will then be used to determine your grade according to the table at right.

The *final exam* is cumulative and will be given at the date and time fixed by the college, namely Friday, December 9, from 3:00 to 5:00 pm, in the computer lab (our classroom).

# Course Schedule

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| Week 1: August 23, 25 | Introduction | Chapter 1 |
| Week 2: August 30, Sep 1 | Basic data structures | Chapter 2 |
| Week 3: Sep 6, 8 | Basic data structures continued | Chapter 2 |
| Week 4: Sep 13, 15 | Analysis | Chapter 3 |
| Week 5: Sep 20, 22 | Recursion | Chapter 4 |
| Week 6: Sep 27, 29 | Sorting and searching | Chapter 5 |
| Week 7: Oct 4, 6 | Review, **Test 1** |  |
| Week 8: Oct 11, 13 | Sorting and searching continued | Chapter 5 |
| Week 9: Oct 20 (Tuesday is fall break) | Trees and tree algorithms | Chapter 6 |
| Week 10: Oct 25, 27 | Trees and tree algorithms continued | Chapter 6 |
| Week 11: Nov 1, 3 | Graphs and graph algorithms | Chapter 7 |
| Week 12: Nov 8, 10 | Graphs and graph algorithms continued | Chapter 7 |
| Week 13: Nov 15, 17 | Review, **Test 2** |  |
| Week 14: Nov 22 (Thursday is Thanksgiving) | Complexity classes and polynomial reduction | Notes |
| Week 15: Nov 29, Dec 1 | NP-Completeness | Notes |
| Week 16: Dec 6 (Last day of classes) | Review for final |  |

# Attendance and Classroom procedures

Attendance is required. If you must be absent, arrange to turn in homework or tests early, since late assignments are penalized. If you must be absent for a test, you have to make every reasonable effort to inform me ahead of time. Usually we can make arrangements for you to take the test separately from the class, but in some cases it may be necessary to make your final count correspondingly more, instead.

Class time will be used for lectures and presentations by the instructor, for classroom exercises as individuals and/or in teams, and for student presentations. We are meeting in a computer lab, so there is a natural tendency to get distracted by the monitors and keyboards around you, or by your own laptop. Using a computer when it is inappropriate to do so, or in a manner that is inappropriate, is rude and disruptive to the classroom. Please use computers only (1) in the ways expressly requested by the instructor, as part of the class, or (2) to take notes. Other than laptop computers (real ones with a real keyboard and display), NO MOBILE DEVICES are to be used in class, so cell phones in particular are to be silenced.

**Honor System**

Please read and adhere to the college’s Academic Honesty Policy as given under the heading **Honor System** in the Student Handbook, accessible via the link <http://www.georgetowncollege.edu/studentlife/honor-system/>.

# Programs

# Homework will be assigned and collected regularly. Homework should be completed independently by each student (see Honor System above). That doesn't mean you cannot discuss concepts related to assignments with each other, but you need to do your own work. You should NEVER copy other students’ work, or let other students write your programs, or download programs online and submit them as your own work.

# Work submitted less than a week late will be accepted but is worth at most 70% and is likely not to be graded in as timely a manner nor as thoroughly as homework submitted on time. Do not expect homework to be accepted more than a week late.

**Disability Statement**

If you are registered to receive accommodations for a disability, please discuss them with the course instructor during the first week of class. You will need official documentation form the Wellness Center (x7074).

# Disclaimer

I hope that the foregoing has given you a good idea of what the course will be like. It should not, however, be construed as a contract or legal document of any sort. In particular, the course content and policies mentioned herein are subject to reasonable modification in response to changing circumstances and events. I will, however, endeavor to notify you well in advance of any needed changes.