

# Principles of Computer Programming I (CSCI 1301)

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Course webpage: <https://piazza.com/gru/spring2020/csci1301/home>

Prof. Eades's Office Hours: T: 8:00am - 10:00am (Cyber Center) and R: 5:00pm - 6:30pm (Allgood)

(Teaching Assistant) Mark Halcomb's Office Hours: M: 1pm - 3pm, T: 5pm - 6pm, and F: 1pm - 4pm in UH ???

Welcome! We begin with a quote:

We need to do away with the myth that computer science is about computers. Computer science is no more about computers than astronomy is about telescopes, biology is about microscopes or chemistry is about beakers and test tubes. Science is not about tools, it is about how we use them and what we find out when we do. –Michael R. Fellows

Computer science can be described as a field whose focus is the solution of computation problems. These are problems that can be solved using mathematics and logic, but with the additional constraint that our solutions make resolving our problems easier or even automatic. For example, computer science has solved the problem of traveling across the Earth over long distances. The problem is, how does one get from point A to point B as efficiently as possible? The solution came from a Dutch computer scientist Edsger Dijkstra in 1956; well before the invention of the GPS. His solution is known as “Dijkstra’s shortest-path algorithm” and is a mathematical solution to our problem. Later, in 1978 the U.S. Department of Defense began launching a constellation of 24 satellites into space for tracking the location of handheld devices known as the Global Positioning System (GPS). These satellites communicate with a handheld device on Earth by sending a constant stream of location data. Essentially, this location data is a ping reporting where on Earth the handheld device is located. It was not long before they realized that this signal gives point A to Dijkstra’s shortest-path algorithm, and then given a B one can use the shortest-path algorithm to find the best possible route to point B, furthermore, the GPS single will update your location along this route as the handheld device moves, and thus, the GPS systems we all use and love was born. The GPS is a combination of mathematics and technology. This combination is the very core of what computer science is.

The quote from above attempts to separate problem solving from the tools we use to make resolving problems easier or fully automated. As we all know, the GPS solved the problem of traveling around Earth once and for all. The solution to the problem is Dijkstra’s shortest-path algorithm, but then we took this solution and combined it with technology to fully automate resolving the problem.

In this course, you will begin your journey on becoming a computer scientist by learning the basics of computational problem solving, and the computer scientist’s primary tool, computer programming. Throughout this course we will solve problems by devising solutions, then implementing our solutions using the Python programming language, and finally, we will verify that our implementations correctly capture the solution to our problems.

## Course Goals

The goals of this course consist of global goals and specialized goals. The former is a set of goals that I believe will benefit the student in a wider area of life than this course, while the specialized goals are the goals of understanding the basic theory of computation.

## Global Goals

The global goals seek to help the student with broad knowledge that will help them throughout life. For example, in other courses and in their future – or current – jobs.

The global goals can be summarized as goals that aim to train the student in critical thinking, and mathematical and logical reasoning. Specifically, we will attempt to understand computational problem solving, composition, abstraction, and software verification.

## Specialized Goals

Specialized goals amount to the content of the course. I break these down into the list of topics as follows (these may change as the semester progresses):

- Computational Concepts:
  - Abstraction
  - Composition
  - Basic logic
- Programming Concepts:
  - Basic operations and types
  - Functions
  - Booleans
  - Lists
  - Loops
  - Arrays
  - Object oriented programming: classes, objects, methods, etc.
  - Recursion.
- Project Management Concepts:
  - Source code control using Git

## Course Materials

All course materials will be freely available in the course repository. The main resource is:

“Python for Kids A Playful Introduction to Programming” by Jason Briggs

## Attendance

Attendance is not mandatory, but highly encouraged. If you do not come to class there is a high probability that you will fail the course.

# Lecture Etiquette

**No one is allowed to use a cellphone, laptop, ipad, tablet, or any other technology during lecture.** This may seem odd, but let me tell you why this is important. If a student is using their device, then that student is not paying attention to the lecture and is losing valuable information. In fact, a study called “The Laptop and the Lecture”<sup>1</sup> conducted at Cornell University in 2003 showed that students disconnected from devices during class outperformed those that were connected<sup>1</sup>.

Another study called “The Pen is Mightier Than the Keyboard: Advantages of Longhand Over Laptop Note Taking” showed that note taking by hand increased memorization of the content even though students with computers can record more precise and a greater amount of content than those taking notes by hand<sup>2</sup>.

Computers distract others not just the user. A study called “Laptop multitasking hinders classroom learning for both users and nearby peers” found that any student within direct view of a laptop or cellphone is being distracted, because the students within view of the device are – on average – watching what the user of the device is doing<sup>3</sup>.

Any student with an university recognized excuse will be allowed to use their required technology during lecture. Please see the professor for arrangements.

## Graded Work

A perfect score is 900 total points:

- (11%) 5-point lecture video quizzes, due every lecture
- (9%) 8 10-point homework assignments, due 01/16, 01/30, 02/13, 02/27, 03/12, 03/26, 04/16, 04/30
- (9%) 4 20-point quizzes, due the weeks of 01/24, 02/07, 03/20, 04/23
- (19%) 34 5-point pass/fail lab assignments, due by the end of lab every week,
- (22%) An in-class midterm exam worth 200 points on 02/20: You must take the midterm at this time unless you have an university recognized excuse.
- (30%) A final exam worth 270 points on 05/01 between 5:00pm - 7:00pm: You must take the final at this time unless you have an university recognized excuse.
- **No late homework will be accepted.**
- **No make up quizzes will be allowed.**

No scores will be curved. Please use the following scoring table:

A : 88 - 100	C : 68 - 77	F : 0 - 57
B : 78 - 87	D : 58 - 67	

## 1 Labs

There is a weekly lab just after the lecture in AH E365. Attendance is not mandatory, but the completion of lab assignments is required. All labs will be released via the students Git repositories, and will be required to be turned in by the end of the lab time which is 4:50pm. The student teaching assistant will be in charge of lab, and there to help students as needed.

<sup>1</sup>[https://web.stanford.edu/dept/CTL/ClassroomLaptops/wikiupload/1/17/Multitasking\\_Hembrooke.pdf](https://web.stanford.edu/dept/CTL/ClassroomLaptops/wikiupload/1/17/Multitasking_Hembrooke.pdf)

<sup>2</sup><http://pss.sagepub.com/content/early/2014/04/22/0956797614524581.abstract>

<sup>3</sup>[http://ac.els-cdn.com/S0360131512002254/1-s2.0-S0360131512002254-main.pdf?\\_tid=8037f3ac-8d3e-11e4-9cea-00000aacb35e&acdnat=1419626210\\_98179c1bbec23f403d7be21fd8868f1b](http://ac.els-cdn.com/S0360131512002254/1-s2.0-S0360131512002254-main.pdf?_tid=8037f3ac-8d3e-11e4-9cea-00000aacb35e&acdnat=1419626210_98179c1bbec23f403d7be21fd8868f1b)

## 2 Pre-Lecture Videos

One really boring aspect of teaching mathematics and computer science is all the wasted time, that could be used for questions and examples, the professor spends writing out simple definitions on the board.

To fix this problem I have incorporated videos into this course. Before every lecture a video will be posted to Youtube and every student will be required to watch the posted video before attending lecture. Then before the lecture begins a quick five minute quiz will be proctored that covers the video.

The videos will introduce you to basic definitions and a few initial examples. Then during lecture we will expand on these definitions and do further examples.

It is crucial that every student watch the videos, because I will not reintroduce these concepts. During lecture questions are encouraged, but I will assume everyone has watched the video before coming to lecture.

## Getting Help

Professors like students have many duties and commitments, and so to be better prepared to help the students outside of class I have the following office rules that must be adhered to:

- If a student needs help, and the question is small – takes at most five minutes to answer – then the student may visit my office at any time, but
- if the question takes longer than five minutes – or has multiple questions – then the student is required to make an appointment by email, or attend office hours.

If a student comes to my office unannounced and the question takes longer than five minutes – or has multiple questions – then that student will be instructed to make an appointment or to come back during office hours.

Appointments are to be scheduled via email and must contain the following:

- The students name,
- a brief description of what the problem is, and
- and a time the student would like to meet.

In this class we will be using the Piazza website for both course announcements as well as getting help. All students should try to participate. Everyone should have received an email from Piazza for them to create a profile.

## Turning in Homework

Version control systems are ubiquitous in computer science, academic research, and in the industry. So we will be using this technology in this course to gain experience for the future.

In this course we will be using the Git (<http://git-scm.com/>) version control system to both disseminate course materials as well as for turning in homework. Everything we need to know about Git and version control will be introduced as part of this course.

**Every student must use git to turn in all homework assignments.** No homework will be accepted if turned in by any other means.

If you need help doing this please see me during my office hours.

# **AUGUSTA UNIVERSITY POLICIES**

The Augusta University faculty and administration believe that, for students to be prepared for career success, it is important for them not only to know the subject matter in their majors, but also to demonstrate professional, ethical, and responsible business and social behavior. Whether a person is interviewing for a job, participating in a business or academic social event, or attending class, there are some important characteristics of personal behavior that are expected by colleagues and administrators. In the business work environment, employees can be dismissed for behavior that is distracting or disruptive to other employees, customers, or administrators.

## **Class Attendance**

If the student has been absent for more than the equivalent of 10 percent of class time, regardless of cause, then the professor may withdraw the student from the class for excessive absences. It is important to note that the instructor may—or may not—withdraw a student from class based upon attendance. In any case, a student should not assume that the instructor has initiated the withdrawal form. A student not withdrawn from a course who stops attending class (or who never attends class) is subject to receiving a grade of WF or F for the course. Please reference the Class Attendance section of the Augusta University Student Manual for further details.

Each student is expected to attend class regularly, to arrive on time, and to remain until class is dismissed. Tardiness and leaving class early are disruptive for other students and the faculty and are behaviors that are not acceptable in a classroom or business setting. Students who do not arrive promptly or leave early may be noted as absent, at the faculty member's discretion. Absences in excess of the maximum prescribed in the course syllabus may result in the faculty member's withdrawing the student from the course.

## **Code of Conduct**

Please review the Student Code of Conduct in the Augusta University Student Manual. It outlines your responsibilities as students and those of a faculty member to maintain the integrity of the learning environment. As outlined in the handbook, disorderly or distracting conduct may result in expulsion from the class. Moreover, any form of academic dishonesty will not be tolerated. Should you be caught cheating or plagiarizing the work of another the procedures as outlined in the handbook and catalog will be followed.

The classroom should be considered a place of business - academic business. Distracting behavior such as uninvited casual talk among students, use of cell phones and beepers, sleeping, or inappropriate behavior toward fellow students or faculty will not be tolerated any more than they would be in a business setting. Faculty have the right and the responsibility to maintain a classroom free of such distractions. Students who persist in such behavior may be asked to leave the class and may be counted absent for the session. Persistent disruptive behavior may result in the faculty member's withdrawing the student from the course.

## **Disabilities**

Students with disabilities must contact the Office of Testing and Disability Services (706-737-1469) before the start of the semester. If you require special accommodation, the office will send a classroom accommodation form to affected faculty. Should you require special accommodations, please contact me at the beginning of the semester to determine how they will be implemented. Please reference the Testing and Disability Services section of the Augusta University Student Manual for further details.

## **Academic Dishonesty**

In an academic community, honesty and integrity must prevail if the work done and the honors awarded are to receive their respect. The erosion of honesty is the academic community's ultimate loss. The responsibility

for the practice and preservation of honesty must be equally assumed by all of its members. Any type of dishonesty in securing those credentials therefore invites serious sanctions, up to and including, a WF in the course, and expulsion from the institution. Examples of dishonesty include actual or attempted cheating, plagiarism, or knowingly furnishing false information to any university employee. Please reference the Academic Honesty section of the Augusta University Student Manual for further details and specific definitions of cheating and plagiarism.

Unethical behavior of students in any form is not acceptable and will not be tolerated. Academic dishonesty (see definitions in the following sections) - cheating on exams, plagiarism of the work of others, unapproved collaboration on graded work, and the like - will be dealt with immediately and with clear consequences. Depending on the nature and severity of the problem, a student who is guilty of any such violation may be: 1) withdrawn from the course with a grade of WF (counted as an F in the GPA); 2) given a grade of zero on the assignment; 3) given a grade of F in the course; or 4) otherwise penalized, at the discretion of the faculty member. Two occurrences of a WF grade for academic dishonesty will result in a student's being expelled from the University, per current University policy as described in the University Catalog.

## Student Appeals and Grievances

Any student who believes that he or she has been treated unfairly under these guidelines should first address the matter with the faculty member responsible for the class. If the problem is not resolved, the student may meet with the Dean or follow procedures outlined in the Academic Grievance Policy section of the Augusta University Student Manual.

## Campus Carry Law

The USG guidance on House Bill 280, commonly known as the "campus carry" legislation, effective as of July 1, 2017 – <http://www.usg.edu/hb280>.

## ACADEMIC DISHONESTY DEFINITIONS

Any attempt to present intentionally the work or knowledge of others as your own on a graded test or assignment constitutes academic dishonesty. The following illustrations do not include every possible variation of academic dishonesty, but they are examples of the kinds of infractions that will be considered academic dishonesty violations. If you have questions about academic dishonesty, please ask any faculty member or any administrator in the School of Computer and Cyber Sciences. It is your responsibility to recognize and avoid initiating or contributing to academically dishonest behavior.

## CHEATING ON A TEST, EXAM, OR ASSIGNMENT

- **Closed-book, closed-notes tests.** The use of any materials except those provided by the faculty member or provided for in test instructions is considered cheating. The use of prepared notes, electronic aids, assistance from others, or the use of any information obtained from others (with or without their permission) during the test is considered cheating.
- **Open-book, open-notes tests.** Assistance from others or the use of any information obtained from others (with or without their permission) during the test, without the permission of the instructor, is considered cheating.
- **Independent projects or papers.** If the faculty member's instructions require independent, unassisted work on a project or paper, no portion of the assignment may be prepared by anyone else. Having any part of the assignment prepared by someone else, or in collaboration with someone else, is considered cheating unless the instructor's instructions specifically call for such collaboration.

- **Assisting others with test information.** Because many courses are taught at multiple times, it is important that students in one section of a course not provide information about a test to any student in another section who will take the same or a similar test at a later time. To do so will be considered cheating.

## 2.1 PLAGIARISM

- **Failure to give credit to others.** On individual and group assignments – projects, papers, presentations, research studies, and the like – no portion of the work may contain quotations of or paraphrasing (rewording) of the work of others unless each such reference is clearly identified with an appropriate footnote or bibliographical reference to the original source and author. To not give credit to others in each such instance is to present the work of others as if you had written it yourself. That is considered plagiarism. Style manuals (such as the American Psychological Association manual) provide guidelines for footnoting, quotations, and other means of giving credit for the work of others. Your instructor may prefer some particular style. If no guidelines are provided, it is your responsibility to use a standard style or ask the faculty member for guidance.
- **Ghost writing.** It should go without saying that having someone else write some or all of a paper or do a project for which you are individually responsible constitutes academic dishonesty. Whether the author is a friend, a paid writer, or a person who offers such services on a web site, the result is an intention to present someone else's work as your own and will be treated as an academic dishonesty infraction.

## 3 Extra Resources

The Reese Library's Cyber Resource Center: <http://guides.augusta.edu/friendly.php?s=cyber>.