

CMPSC 480
Software Innovation 1
Fall 2019

If innovation is about anything...it is about creating a future that does not exist in the present; it is about taking what is now intangible and rendering it tangible, taking the unseen and making it seen. Innovation is not *here*; it is *there*, in the future. Essentially, innovation is taking what is not true in the present and making it the true in the future.

—Henry Doss, “Innovation Emerges From Stories We Tell,” *Forbes*

Course Information

Discussion 1:30 - 2:20 R Alden Hall 101

Instructor Douglas Luman
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Student Hours

Monday 9:00 - 11:00; 1:00 - 2:30
Wednesday 9:00 - 11:00
Thursday 9:00 - 12:30
Friday 9:00 - 11:00; 1:00 - 3:00

To schedule an appointment, visit <http://cs.allegheny.edu/sites/dluman>. Should none of the above times work for your schedule, let me know: we can work out a better time either via email or our course’s Slack channel.

Required Texts

This course requires a wide variety of reading; I will supply either links to or reproductions of any material assigned.

Canonical Course Description

An introduction to the technical and communication skills needed to design, implement, and publicly release innovative software. In addition to establishing connections with professionals in the software field, students refine their writing abilities as they participate in online technical communities. During a weekly practical session, students use state-of-the-art tools to complete well-documented software that is useful to external collaborators, describing their systems through oral presentations and written documents featured on a web site.

Prerequisite Knowledge CMPSC 101
Distribution Requirements None

A Course on “Software Innovation”

Generally speaking, developers in the field who are in charge of hiring decisions reduce how they make those decisions to two factors:

1. Communications skills
2. Development skills

And many report these two factors in that order. As Douglas Crockford, developer of the JSON format, discusses with author Peter Seibel in *Coders at Work*:

SEIBEL: When you’re hiring programmers, how do you recognize the good ones?

...

CROCKFORD: ...I’m looking for quality of presentation...how effectively they can communicate, that’s a skill I’m hiring for....I would focus on the communication aspect.

So far, you’ve focused your academic career on acquiring the second of these two sets of skills. In CMPSC 480, we’ll shift our awareness to the way in which these skills interact and how writing and talking about your relationship to your development projects provides clarity for what we mean when we say “innovation.”

As a 2017 report by David J. Deming for the National Bureau of Economic Research (NBER) points out, the “unusual combination” of technical and so-called “soft” skills enjoys substantial currency. Most importantly, as author Austin Kleon reminds us, “[y]our work doesn’t exist in a vacuum...[w]hether you realize it or not, you’re already telling a story about [it].” It is this story where, as Henry Doss points out, innovation begins. Despite your trajectory—whether aiming for a career or graduate school—the world is interested in how you tell *your* narrative about *your* contributions. This course will help you recognize, create, and use these innovation narratives.

Learning objectives

By the end of this course, you will:

- Develop tools and skills to understand and relay your identity as a developer
- Create an online web presence which showcases that professional identity and the work which supports it
- Learn how to contribute to the on-going professional conversation about software development
- Understand industry standards, best practices, and ethics
- Begin the process of planning next steps toward opportunities in which you’re interested

Grading

Class Participation	20% (200 pts.)
Assignments	40% (400 pts.)
Web Project	40% (400 pts.)
Total	100% (1000 pts.)

Class Participation: One of the main learning vehicles for a discussion-based class is participation. The term “participation” should mean any of the following things in this course: active engagement in class activities, asking or answering questions, or involvement in the course’s Slack channel discussions. Attendance at each course counts for ten (10) points, and an additional four (4) points per course session will be added based on an individual student’s contribution during or after the course sessions.

Assignments: Each week will feature either new or ongoing assignments. These assignments play a crucial role in planning and developing various components of the course-culminating *Web Project*. Subjects for these assignments will range from personal skills inventories to participating in software review sessions. All assignments create opportunities to strengthen the ways that students interact with and present themselves to others in the software development discipline. The amount of points for each assignment is progressive, and reflects the difficulty inherent in the tasks required.

Web Project: The final course assignment brings together various components created during the semester’s assignments. While some assignments will feature tangible products (e.g. code, site copy, et al.) others may be more ambiguous, but no less influential in nature (e.g. personal narrative work, content structures, et al.). The final product, the web site, should function as both a résumé and portfolio, but feature its various components in a manner consistent with the professional identity intended.

Assignment Deadlines

Students may turn assignments in up to one (1) week late, though a 15% penalty applies to the final grade. In order to satisfy this condition, late assignments must be turned in *no later* than exactly one (1) week after the original deadline. Failure to meet the extended late assignment window will cause students to receive a zero (0) % for the given assignment.

The final assignment, the Web Project, is not eligible for this extension.

Note on Attendance

Class attendance is mandatory. That written, you may encounter circumstances which require absence during a given class period. Generally, I require notification one (1) week in advance of an absence. Should you be absent due to an emergency, notify me as soon as is practical. Students who accumulate more than five (5) unexcused sessions will have their course grade reduced one (1) letter grade. Frequent or prolonged absences due to illness should be documented by the student’s doctor, the Health Center, the Dean of Students office, or the Student Disability Services.

Class Preparation

I expect students to arrive to class prepared. Here, “prepared” means having completed reading assignments, compiled questions, and being ready to engage in thought-provoking discussion predicated on current concepts and material. In order to assist students’ preparedness efforts, I will provide a schedule with reading assignments and will accompany all discussions with slides or summaries of class activity.

Classroom Ethics

The discipline of computer science, like many others, encourages its members to act according to discipline-specific ethics. I encourage you to take time to review the Association for Computing Machinery (ACM) **Code of Ethics**. The Department of Computer Science maintains a brief poster version of this code on the first floor of Alden Hall.

The Allegheny College Statement of Community

Allegheny College also expects students and faculty to act according to its Statement of Community:

Allegheny students and employees are committed to creating an inclusive, respectful and safe residential learning community that will actively confront and challenge racism, sexism, heterosexism, religious bigotry, and other forms of harassment and discrimination. We encourage individual growth by promoting a free exchange of ideas in a setting that values diversity, trust and equality. So that the right of all to participate in a shared learning experience is upheld, Allegheny affirms its commitment to the principles of freedom of speech and inquiry, while at the same time fostering responsibility and accountability in the exercise of these freedoms. This statement does not replace existing personnel policies and codes of conduct.

Keep both of these standards in mind as you exercise your academic inquiry in this course. These serve as our fundamental “first principles” in pursuit of our shared academic goals.

Seeking Assistance

Assistance with course concepts

Students who struggle to understand knowledge and skills defined in this course are encouraged to seek assistance from the course instructor. To meet with me, consult my available office hours (above) and make an appointment.

tl;dr: historically, students who are successful in my courses visit and discuss questions and concerns about course concepts with the instructor early and often.

Assistance outside of the course

If you find yourself in difficult circumstances which affect your ability to participate in or complete course work, let me know immediately. Full stop.

Do not wait until the end of the semester. Part of my role as a course instructor is to make sure that students receive the assistance they need. Do not hesitate to let me know if there is anything I can do with respect to your ability to handle your work.

In some situations, it may be helpful to consider the following resources:

The Maytum Learning Commons +1 814-332-2898

<http://sites.allegheny.edu/learningcommons/tutoring/>

Allegheny College Counseling Center	Schultz Hall	+1 814-332-4368
The Winslow Health Center	Schultz Hall	+1 814-332-4355
Student Life	Campus Center	+1 814-332-2800

Special Needs and Disability

Students with disabilities who need accommodations in this course are encouraged to contact Disability Services at +1 814-334-2898. Disability Services is part of the Learning Commons, located in Pelletier Library. Should you need accommodations, contact this office as soon as possible to ensure that approved accommodations are communicated and implemented as quickly as possible. This serves both you and I in providing the best environment for learning and support.

Honor Code

All students and faculty at Allegheny College are bound by the Honor Code. Everyone expects that your behavior reflects this commitment. Given the eminently shareable and reproduceable nature of code, the Department of Computer Science adds the following statement to the general college policy:

Department of Computer Science Honor Code Policy

It is recognized that an important part of the learning process in any course, and particularly in computer science, derives from thoughtful discussions with teachers, student assistants, and fellow students. Such dialogue is encouraged. However, it is necessary to distinguish carefully between the student who discusses the principles underlying a problem with others, and the student who produces assignments that are identical to, or merely variations on, someone else's work. It will therefore be understood that all assignments submitted to faculty of the Department of Computer Science are to be the original work of the student submitting the assignment, and should be signed in accordance with the provisions of the Honor Code. Appropriate action will be taken when assignments give evidence that they were derived from the work of others.

As the nature of "plagiarism" and constituents of "fair use" change often, the department encourages you to periodically review the specific tenets of the general college Honor Code provided in the latest course catalog and in the *Compass*.

The above statement, of course, also applies to online forums such as Stack Overflow, et al.