

COMP190 – Tools and Techniques for Software Development
Dickinson College
Fall 2020
Prof. Grant Braught

Course Description: An introduction to the Unix command line environment, shell scripting, system administration, debugging tools and version control. Skills developed will be applied in the context of a Humanitarian Free and Open Source Software (HFOSS) project. Case studies of social, legal and ethical issues raised by computing and computing for the greater good will complement the technical skill development.

Prerequisite Knowledge: This course assumes at least a semester of prior programming experience in a high-level language. The nominal prerequisite is Dickinson COMP130 - Introduction to computing and at least concurrent enrollment in Dickinson COMP 132 - Principles of Object-Oriented Design.

Course Learning Objectives: Students will:

- gain proficiency with command line interaction with a Unix operating system including installation and configuration of software, shell scripting and basic system administration tasks.
- gain proficiency with modern software development tools and their common uses including a debugger and a version control system.
- deepen their understanding of social and ethical issues in computing and their appreciation of computing for the greater good.
- [WiD goal] develop their ability to produce clear, concise, technical writing for developers.

Format: On campus this course is scheduled as a ½ credit course that meets 1-day/week for 75 minutes. However, to adapt to the current COVID-19 related constraints the course will be offered this semester in a remote format using primarily asynchronous methods of delivery with ample opportunity for (and some required) synchronous interaction with the instructor and your peers.

While this course is primarily asynchronous, it will still be run on a one day per week schedule. New course materials will be posted on Wednesdays. Assigned work from each week will be due on the following Wednesday.

Materials: All course materials including, videos, readings and assignments will be delivered via the course Moodle. All work will be submitted, graded and returned in pdf format via the course Moodle. A complete outline for the course also appears in the course Moodle.

Communications: All communications will occur through Teams, which is accessible though the campus Gateway and via the Teams desktop or mobile apps. You will receive an e-mail invitation to join the course Team.

Office Hours: A list of my office hours and availability is provided on my home page (users.dickinson.edu/~braught/). If you have conflicts with my regularly scheduled office hours or would like to schedule a separate meeting please message me on Teams. All office hours and course related meetings will be held virtually in the Office Hours channel on Teams.

Instructional Elements: The instructional elements of the course are described below along with information about each.

- **Introductory Videos and Readings:** These videos, readings and slides introduce the day's topic, set the stage, and contextualize it within the course. They will prepare you to begin the Activities (see next bullet.) You should expect that the introductory videos and readings will require 20-30 minutes per class.
 - **I will:** Create and/or identify and curate these materials and post them to the course Moodle on Wednesdays.
 - **You should:** Set aside a specific time that works for you each Wednesday to watch/read these materials on the day that they are posted. Think of this as you would think of attending an in-person class. Take notes and review them as you would for the readings or lectures of any in-person class. Ask questions of your classmates and instructor on the course Teams and/or consult the instructor during office hours or individual appointments.
- **Activities:** Each topic will include a collection of activities that guide you through the development of the main ideas, techniques for solving problems and provide practice with the material. These activities will start from the introductory material but will also contain additional videos/readings and guide you through the learning of additional new material that builds on the introductory material. You should expect that the Activities will require up to 3 hours (Note: This is consistent with Dickinson's standard that every hour in class is accompanied by 3 hours of work outside of class).
 - **I will:** Post the Activities to the course Moodle on Wednesdays. I will post detailed solution sets to the Moodle following the due dates for the Activities. Activities will be reviewed for completeness and individual questions will be marked with feedback to facilitate self-assessment of your understanding in combination with the solution sets. Overall, each Activity will be marked as "Competent" or "Not Yet Competent." Any Activity marked "Not Yet Competent" may be revised and resubmitted.
 - **You should:** Begin the activities early and submit on time. The material in the course is cumulative and often an understanding of new material depends heavily on understanding the material from the prior day. Review the feedback provided on your submissions, compare your answers to those in the posted solutions, assess and improve your understanding and resubmit as necessary. Ask questions of your classmates and instructor on the course Teams and/or consult the instructor during office hours or individual appointments.
 - **Collaboration:** Sharing of code or answers to the actual Activity questions is not permitted. However, you may ask general questions on Teams and you may

work in pairs on Activities. If working in a pair, all work on the Activities should be completed synchronously and only one submission should be made per pair. When working in a pair, learning is a shared responsibility. You must ultimately ensure both your own and your partner's mastery of all of the material. You must be willing to ask for clarification and explanation from your partner and to provide clarification and explanation to your partner – freely and as often as is necessary.

- **Outside Sources:** There are often calculators and tools that will generate answers to computational problems, places where answers can be looked up, or where others can be asked for solutions. For some problems you will be expected to use these types of resources and that will be explicitly indicated. Otherwise, the expectation is that you should be able to answer the question based on what you already know combined with careful and creative thought and diligent effort. Always keep in mind that you are responsible for ensuring your own mastery of the material.
- **Quizzes:** There will be a short Moodle quiz roughly every week that will revisit material from the prior weeks. This will include material from the most recent week, but may also include material from the earlier in the course.
 - **I will:** Post the quizzes to Moodle each week.
 - **You should:** Obtain 100% on the quiz. Quizzes will be auto graded with immediate feedback and you will be permitted as many attempts as you like.
 - **Collaboration:** Quizzes are individual work and must be completed on your own. You may not discuss the questions with anyone else.
 - **Outside Sources:** You may use any non-human outside sources during the quizzes. So, you may use all course materials, notes, and even google searches when taking the quizzes.
- **Engagement:** Engagement with the course material is an important part of learning and can be particularly challenging with remote instruction. Engaging with the instructor and your classmates are effective ways to improve and assess your understanding of the material. Thus, demonstrating engagement will be a required part of this course.
 - **I will:** Regularly monitor the course Team for questions and provide responses as necessary, maintain regularly scheduled office hours (in Teams) and be available for scheduled individual appointments outside of regular office hours.
 - **You should:** Ask questions of your classmates and instructor on the course Teams and/or consult the instructor during office hours or individual appointments.
- **WiD:** This course is part of the WiD thread in the Computer Science Major. Students completing the Computer Science Major satisfy the WiD graduation requirement by maintaining a portfolio of assignments from the courses on the Writing in the Discipline Thread (see: www.dickinson.edu/homepage/402/computer_science_curriculum). To satisfy the WiD goal for this course one of the Activities will include a writing

assignment. You will receive feedback from your peers and/or instructor on a first draft of the assignment, which you will then use to revise your work. Both the draft and the revision must be uploaded to your WiD repository on GitHub. Instructions for creating and uploading your work will be provided in the Activity.

Grading: This course is graded credit/no credit for all students using the criteria outlined below.

To receive credit for the course you must:

- Receive a “Competent” score on each Activity.
- Score 100% on all Moodle Quizzes.
- Have a demonstrated Engagement with the course at least once per week. This could include:
 - Responding to a classmate’s question on Teams.
 - Asking a question of your classmates or the instructor on Teams.
 - Participating in a regularly scheduled office hour.
 - Having an individually scheduled appointment for a specific purpose.

Academic Integrity: Please take the time to read Dickinson’s position on Academic Integrity in the [Advising Handbook](#). Violations of this policy are considered serious transgressions, so you should be especially certain that you understand your rights and responsibilities under it. The specific collaboration policies for this course have been outlined in detail in the Instructional Elements section above. If you are unsure about whether or not certain kinds of collaboration are permissible in this course, ask your instructor. Students suspected of academic dishonesty will be referred directly to the [Student Conduct Process](#).

Intellectual Property Rights: Audio or video recording of class meetings, lectures or discussions is prohibited without explicit permission of the instructor. Photographic records of whiteboards, projected slides or other visual media is also prohibited without explicit permission of the instructor. In any case where permission is given for audio/video/photographic records to be made they are for personal use only. They may not be shared or redistributed and must be destroyed at the end of their usefulness or within one week following the termination of this course, whichever comes first.

Students may not share, edit, send, post, publish, make public, or duplicate any recordings without the written authorization of those recorded. Failure to abide by these rules is a breach of privacy and a violation of copyright laws. It is furthermore considered a serious violation of Dickinson College Community Standards and subject to disciplinary action. Unless informed otherwise, students are to destroy any recordings shared by their professors at the end of the semester. Thank you for your compliance.

Accommodations for Students with Disabilities: Dickinson values diverse types of learners and is committed to ensuring that each student is afforded equitable access to participate in all learning experiences. If you have (or think you may have) a learning difference or a disability –

including a mental health, medical, or physical impairment – that would hinder your access to learning or demonstrating knowledge in this class, please contact Access and Disability Services (ADS). They will confidentially explain the accommodation request process and the type of documentation that Dean and Director Marni Jones will need to determine your eligibility for reasonable accommodations. To learn more about available supports, go to www.dickinson.edu/ADS or email access@dickinson.edu.

If you've already been granted accommodations at Dickinson, please follow the guidance at www.dickinson.edu/AccessPlan for disclosing the accommodations for which you are eligible and scheduling a meeting with me as soon as possible so that we can discuss your accommodations and finalize your Access Plan.

Life Happens: Sometimes stuff just happens, even more so in the challenging situation in we currently find ourselves. Sometimes it is an unexpected sudden event such as an illness or family emergency. Other times it may be an ongoing issue or concern or an accumulation of smaller issues. Any of these things may affect your (or my) ability to focus or perform up to your (or my) potential through no shortcoming or fault of your (my) own. Dickinson is a kind and caring community and we want to see you achieve at your full potential. So, if you are experiencing life events that are affecting your performance please don't hesitate to talk to your instructor, your advisor or your class Dean. They will all be willing to talk with you, help to formulate a plan and/or connect you with others that may be able to assist. If I am experiencing such events, I will communicate them to you as well and we will adapt.