

**This syllabus is a contract between the student and the instructor. Your continued enrollment in this course constitutes your acceptance of this contract.**

### **Instructor:**

Jason B. Shepherd, Ph.D.  
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Email: [shepherd@bvu.edu](mailto:shepherd@bvu.edu)

Instructor availability can be determined through Outlook. The instructor's schedule and office hours can be found at <https://jbshep.github.io/schedule/>. Students seeking office appointments beyond posted hours are *strongly* encouraged to send meeting appointments through Outlook.

### **Course Description:**

*From the BVU Academic Catalog:*

A survey of modern software engineering practices and theory. Emphasis on software development lifecycle models and processes, software specification, software design, agile methods, modeling, object orientation, frameworks, APIs, testing, project management, risk mitigation, and ethics. Special attention will be paid to software reliability and maintainability.

*Additional Narrative:*

The philosophy and milieu of software engineering has changed substantially, if not fundamentally, over the past ten to fifteen years. This shift is largely due to the introduction of agile software development methodologies and impressive toolchains and APIs. Ambitious software engineers can now build mature Web and mobile applications that consume and produce data from varied sources in a matter of months. Agile methods and the various frameworks and tools used within them may seem daunting to the "fresh-out-of-college" new engineer, especially given the ways they are applied in very large-scale projects.

Our class will be split into different software development teams that will operate according to agile software methods. Each team will have its own project. The instructor and one other student (to be chosen during the first week of class) will serve as the technical lead developers and project managers for each team. Each team will be broken into smaller sub-teams that will be responsible for the development of components within the system. Through this sub-team arrangement, we will be able to experiment with pair programming, programming by contract/API development, and integration resolution with other sub-teams. Functionality

**Course Description (continued):**

within the system shall be defined in consultation with our “clients” through the development of personas and user stories.

**Prerequisites:**

CMSC 182 Computer Science II: Data Structures

**Course Times and Locations:**

Lectures: TR, 1:30 P.M. – 2:45 P.M. in ESSC-139  
with stand-up planning meetings and lab in ESSC-130 and ESSC-134  
Finals Week Timeslot: 16 December 2021 from 2:45 P.M. to 4:45 P.M. in ESSC-139

**Course Objectives:**

1. Describe software development lifecycle (SDLC) models and their relative advantages and disadvantages given the circumstances surrounding a specific software project.
2. Elicit project requirements through the use of user stories and personas.
3. Describe how software can interact with a variety of systems and how design-by-contract helps facilitate this. Students will be able to articulate the effect design choices have on the reliability and maintainability of a software system.
4. Design and implement effective unit-level and system-level tests.
5. Demonstrate how to program in a team-based environment using build management, automated testing, agile methods, source control, and modern software tools and APIs.
6. Give oral presentations on a software project to both technical and non-technical audiences.

**Course Materials and Resources:*****Learning Management System (Canvas):***

<http://bvui.instructure.com>

Canvas learning management system – contains syllabus and grades. All scheduling information can be found in this syllabus, and any changes to the schedule will be communicated through Slack.

***Messaging Service (Slack):***

<https://bvcompsci.slack.com/>

Changes to the course schedule will be communicated on Slack channel softeng19. As the course progresses, each team will have their own assigned Slack channel as well.

***Class GitHub Repository:***

The class GitHub repository can be found at <https://github.com/jbshep/softeng21/>. This URL will not be accessible to students until after they have messaged their GitHub user ID to the instructor through Slack. The instructor will walk students through obtaining a GitHub user ID during the first day of class.

***Required Readings/Videos:***

Links to all assigned readings can be found on the class GitHub repository. The dates by which readings should be completed are given on the Course Schedule found in this syllabus.

***Required Software:***

By the start of the second day of class, students must have completed the following.

- Students must have created a GitHub user ID and must have messaged their ID to the instructor via Slack. Please send a direct message. Do not post your GitHub ID to the course Slack channel.
- Students must have the following software installed on their laptops: git, a recent version of Python 3, and virtualenv.

The instructor will give instructions for performing these tasks during the first day of class. We will use Python, git, GitHub, virtualenv, and Slack regularly in this course.

## Course Schedule:

The course schedule consists of three weeks of introductory material, then ten weeks of working through a software project, and finally a project launch activity. The table below lists topics covered as well as readings and assignments/milestones to be completed each day.

Day	Work to be Done	Day	Work to be Done
08/31	Syllabus, Schedule, SDLC	10/28	Intro to Rendezvous milestone (M4), <b>M3 Due (incl. tests)</b>
09/02	Version Control. Read Ruparelia (2010) and Shah (2016). <b>"Required Software" Instructions Due.</b> <b>A1 Due.</b>	11/02	Stand-up 4, Rendezvous, Lab 4
09/07	Version Control. Read up through Section 2.4 "Undoing Things" of the book <i>Pro Git</i> . <b>A2 Due.</b>	11/04	Rendezvous continues, Lab 4
09/09	Code Conventions, SW Design	11/09	Rendezvous continues, Lab 4
09/14	SW Design, <b>A3 Due</b>	11/11	Rendezvous continues, Lab 4
09/16	SW Design	11/16	Rendezvous continues, Lab 4
09/21	Stand-up 1	11/18	Rendezvous continues, Lab 4
09/23	Lab 1	11/23	Stand-up 5, <b>M4 Due</b>
09/28	Stand-up 2, <b>M1 Due</b>	11/25	NO CLASS: Thanksgiving Break
09/30	Lab 2	11/30	Lab 5
10/05	Testing, <b>M2 Due</b>	12/02	Lab 5
10/07	Testing	12/07	Stand-up 6, <b>M5 Due</b>
10/12	Stand-up 3, <b>A4 Due</b>	12/09	Lab 6
10/14	Lab 3	12/16	Launch (2:45 P.M. – 4:45 P.M. in ESSC-139), Final Presentations, <b>M6 Due</b>
10/19	Lab 3		
10/26	Lab 3		

Software design mini-lectures ("SW Design") will be given throughout the course after the introduction on 09/14 and 09/16. Students will be notified via Slack.

The Rendezvous milestone starting in late October is an activity where two or more project teams will "merge" into one team in an effort to build out more advanced project features. Your instructor will also join the project teams at this point as well. The Rendezvous is a significant activity in helping students achieve Course Objective #3 and is unique to BVU's Software Engineering course. No other software engineering courses in the world are known to include this type of learning activity.

## **Academic Honesty Policy:**

Buena Vista University believes that personal integrity and academic honesty are fundamental to scholarship. We strive to create an environment where the dignity of each person is recognized, and an atmosphere of mutual trust exists between instructors and students.

Accordingly, honesty in all academic matters is expected from all students. Actions contrary to academic integrity will not be tolerated. Any attempt to cheat, misrepresent someone else's work as one's own, receive credit for work one did not do, obtain an unfair advantage over other students, or aid another student to do the above will be considered a breach of academic integrity. The faculty have confidence in the integrity of students and encourage students to exercise good judgment in fulfilling this responsibility.

Activities that have the effect or intention of interfering with learning or fair evaluation of a student's work or performance are considered a breach of academic integrity.

Examples of such activities include, but are not limited to:

- **Cheating** (intentionally using or attempting to use unauthorized material, assistance, or study aids in any academic work). For example, using a cheat sheet for a test, looking at another student's paper during an exam, stealing or buying all or parts of an exam or paper, altering and resubmitting work for a better grade without prior approval to do so, etc.
- **Plagiarism** (representing another's ideas, words, expressions, or data in writing or presentation without properly acknowledging the source). For example, misrepresenting another's work as one's original work, using someone else's idea without giving proper credit, failing to cite a reference, or failing to use proper documentation, using works of another gained over the internet and submitted as one's own work, etc.
- **Falsification and/or misrepresentation of data** (submitting contrived or made-up information in any academic exercise). For example, making up data, citing non-existent sources, etc.
- Facilitating academic dishonesty (knowingly helping or attempting to help another violate any provision of the academic honesty policy). For example, working together on a take-home exam or other assignment when the option has not been made available, giving your paper/assignment to another student for his/her use, etc.
- **Computer crimes** (damaging or modifying computer programs without permission). For example, software piracy, hacking, constructing viruses, knowingly introducing viruses into the system, copying programs, and/or data belonging to others, etc.
- **Multiple submissions** (submitting, without prior approval from the instructors involved, any work submitted to fulfill academic requirements in another class). For example, submitting the same paper for two different classes, etc.

**Academic Honesty Policy (continued):**

- **Misrepresentation of academic records** (knowingly misrepresenting or tampering with any portion of official records of the university or transcripts). For example, forging a change of grade slip or registration form, tampering with computer records, etc.
- **Unfair advantage** (trying to gain an unauthorized advantage over fellow students). For example, gaining or facilitating unauthorized access to exam materials (past or present); interfering with another student's efforts in an academic exercise; lying about the need for an extension on a paper or assignment; destroying, hiding, removing, or keeping, library materials, etc.

Any violation of this policy will be treated as a serious matter. The instructor has primary responsibility for classroom behavior and maintaining academic integrity. Instructors are encouraged to specify clearly at the beginning of each course what constitutes violations of academic honesty and the consequences for academic dishonesty. In cases of repeated or flagrant violations, a student may be dismissed from the university. Depending on the nature and severity of the offense, the university reserves the right to exact maximum penalty, even in the case of a first offense.

**In this course**, on the first offense, you will fail the exam or homework and you will be reported to both the Office of Academic Affairs and your academic advisor. Two or more offenses will be handled more severely with penalties including, but not limited to, failing the homework/exam, reduction of the final grade by a full letter grade, official letters written to the Office of Academic Affairs and to your academic advisor, and/or expulsion from the university.

Students should go online and read the University's Academic Honesty Policy:  
<https://www.bvu.edu/policies/academic-honesty>

**Expectations:**

Check the `softeng21` Slack channel daily. It is your responsibility to stay current with the course schedule and any changes in course plans.

Know the contents of this syllabus, especially the various course policies. This syllabus serves as your contract in this course.

All students in this course are college students, and as such I expect you to perform college level work. Take handwritten notes in class. There will be moments during class where the instructor will share vital information verbally, and this information will not be shared again on Canvas, GitHub, or in a PowerPoint slide. You are still responsible for this information. Take pride in your work. Start early on assignments and do not leave them until the last minute. Any written homework should be done neatly, and any typed homework should be well organized. Craft your work as if you intended to show it to a potential employer or graduate school in the future. If you have an assignment that requires you to generate prose, you should use standard formal English and write in a tone appropriate to the assignment and course.

Reading assignments must be completed before class. You should ready your mind before class and not use the time to check social media Web sites. Ask good questions. Try out examples from the reading and see if you can modify them. Try to go one step beyond the requirements for an assignment. Force yourself out of your comfort zone and into the realm of the independent learner. Attending class lectures is important, but true mastery of the material can only come from your hard work outside of class. In most cases, you will need to spend two to three hours (or more) outside of class for every one hour you spend in class. Simply coming to class and trying to learn the material solely in the classroom will be woefully inadequate.

Beyond receiving a grade, students often ask their instructors for letters of recommendation at some point during their academic careers. You should ask yourself whether your work and participation merits a good recommendation. You must **earn** good recommendations from your instructors, and this should be in the back of your mind as you compose your work and conduct yourself in the classroom.

## **Communicating with your Instructor:**

When I am not in class, you can usually find me in my office unless I have a previously scheduled meeting. If I am not physically available, you are welcome to send me email. I will make every effort to respond to email within 24 hours.

The way you format email messages is important. Your undergraduate education should prepare you to succeed in your career, and a significant part of your education should be practicing how to communicate clearly and professionally. I expect you to format your emails as if you were addressing your supervisor in a professional environment. The first email message in each **new** conversation thread **must** include a professional greeting (e.g., “Hello, Professor Shepherd”) and a proper closing (e.g., “Best regards, Chris Smith”). Subsequent messages in an ongoing conversation need not include these formalities. All messages should demonstrate command of the English language by exhibiting proper spelling, punctuation, and capitalization. I will respond to messages that are not professional and respectful with a suggestion to reformat your message before I respond to your request (e.g., starting your message with “Hey” is unacceptable). I am not doing this for my benefit. I am doing this because I want you to practice the good habits of a successful professional. An awareness of the difference between how you communicate with friends versus how you communicate with professors/supervisors/etc. is an important byproduct of your education.

Students often ask how they should address their instructors in both lecture and conversation. I would suggest you refer to me as “Professor Shepherd” or “Dr. Shepherd.” Frankly, I don’t care all that much if you call me by my first name or by a more formal title. However, you will encounter some people in your chosen career that do care a great deal about how others address them. Again, if we are to practice good habits of communication, you should err on the side of caution and address people in a formal manner until they advise you otherwise (e.g., “No please, call me Jason.”). I would strongly suggest that you refer to all your instructors as “Prof. So-and-so” until you are told otherwise, and that way you also don’t have to guess as to whether someone is a Dr., Mr., Ms., etc.

As stated above in the **Instructor** section, my availability can be determined through Outlook. I am **always** available **by appointment**. If my advertised availability in Outlook does not present a convenient time, please call or email me to set up a different time to meet. I have always and will always do everything I can to meet with students who need assistance.



**Attendance:**

Your regular attendance in this class is extremely important. All new course material builds on – or is related to – previous material, so missing class will make it difficult to succeed in this course. Students are expected to arrive to class on time and be in a seat at the start of class. If you arrive late, please try to select a seat that will disrupt class as little as possible. During class time, make every effort not to leave the classroom. Leaving the classroom is distracting to both your instructor and to other students. Take care of any personal needs before you enter the classroom (e.g., use the restroom *before* class time, bring facial tissue if you have a cold, etc.).

If you must miss class, you must let your instructor know (a quick email message will suffice). When you miss class, it is *your* responsibility to get caught up. You should talk to other students enrolled in the class to get their notes and see what you missed. Any material that we work on in class will be posted electronically, and you are expected to download that material—and try to understand it—prior to the next class period.

Failure to comply with the attendance policy will result in a warning. Routine violation of the attendance policy may result in dismissal from the class.

**Exams and Quizzes:**

There are no exams or quizzes in this course.

**Grading:**

Students may elect plus/minus letter grading or pass/fail grading. The grading scale in this course is as follows.

	<u>+/- Letter</u>	<u>P/F</u>
93% - 100%:	A	P
90% - 92.99%:	A-	P
87% - 89.99%:	B+	P
83% - 86.99%:	B	P
80% - 82.99%:	B-	P
77% - 79.99%:	C+	P
73% - 76.99%:	C	P
70% - 72.99%:	C-	P
67% - 69.99%:	D+	P
63% - 66.99%:	D	P
60% - 62.99%:	D-	P
0% - 59.99%:	F	F

Your final grade will be based on points from assignments, project milestones, and presentations.

In assignments, students will be required to read material and either reflect deeply on the material or perform a task using knowledge encountered in the material.

In project milestones, student teams will use an agile software methodology to conduct a project “sprint.” During the sprint, teams will program solutions to issues in their backlog. These solutions will exist in git branches and will be reviewed and merged through GitHub’s Pull Request mechanism. Milestones will be evaluated based on quality of coding work and adherence to process. Further requirements for completing milestones will be posted to the class GitHub repository once the project portion of the class begins.

There will be a team presentation during the finals week period. The requirements for the presentation will be posted to the course GitHub repository. The intent of the presentation will be to share a status report of your project to both technical and non-technical audiences.

**Assigned Collaborative Group Work:**

The collaborative team nature of most of the graded activities in this class deserves special consideration. On occasion, a student will not pull his or her own share of the effort. Because of this, each team member will be asked to evaluate themselves and each other group member after the work is completed. The instructor will take these evaluations into account when assigning the final grade to each team member. If certain team members did not pull their own weight, their grades will be reduced accordingly

**Materials:**

Unless directed by the instructor, you must bring with you to each class period: your laptop, writing utensils (preferably #2 pencils), and notebook paper. You must be prepared to use these materials in class.

**Technology:**

Every student is required to have a laptop with a recent version of Windows or macOS installed. Laptops with Linux installed may be used but students must confer with the instructor first. The instructor will instruct you as to whether you should start class with your laptops open or closed. Laptops, tablets, and all other electronic devices will be used for class-related activities only. Mobile phones (a.k.a. “cell” phones) must be inaudible during class (i.e., turn their ringer off). You may not answer your mobile phone in the classroom. You may not communicate with others via your mobile phone during class (e.g., texting). Listening devices may not be used (e.g., headphones, ear-buds, iPods, etc.) unless proper accommodations have been made (see **Accommodations** section).

If you choose not to abide by this policy, you will be warned. Repeated violations of this policy may result in you being asked to leave the classroom and possibly even being dismissed from the course altogether.

**Disability Student Services and Accommodations:**

Buena Vista University provides reasonable accommodations through an organized process. Students desiring accommodations must follow the University's process. Forms are available at: <https://www.bvu.edu/bv/cae/disability-services>. You can complete the form and return it with your documentation to Donna Musel at [museld@bv.edu](mailto:museld@bv.edu). Please contact Donna Musel, Director of the Center for Academic Excellence (CAE), if you have questions or need assistance with the process.

**Academic Services:**

Buena Vista University provides academic services through the Center for Academic Excellence (CAE) which serves as the university's academic support unit. Students may access tutors in the CAE. Students are able to schedule regular appointments or drop in as needed. Some tutoring sessions may be offered through Zoom.

**COVID-19 Safety:**

Let's keep each other safe! As the COVID-19 pandemic continues to evolve, we remain committed to keeping members of the BVU community healthy. All Faculty and staff may require masks. If a faculty or staff member requests that you mask in their classroom, office, or when interacting with them, you must comply. Failure to do so is a Student Conduct policy violation and will be referred to security and is subject to student conduct penalties.