BUENA VISTA
U N I V E R S I T Y

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.
Office: ESSC-104
Phone: 712-749-2281
Email: shepherd@bvu.edu
Also available as **jbshep** on social media and Slack.

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: 11 December 2019 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://bvu.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/softeng19/. 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
08/27	Syllabus, Schedule, SDLC	10/22	Stand-up 5, Rendezvous begins, *M4 Due (incl. tests)*
08/29	Version Control. Read Ruparelia (2010) and Shah (2016). *"Required Software" Instructions Due.* *A1 Due.*	10/24	NO CLASS: Fall Break
09/03	Version Control. Read up through Section 2.4 "Undoing Things" of the book *Pro Git*. *A2 Due.*	10/29	Rendezvous continues, Lab 5
09/05	Code Conventions, SW Design	10/31	Rendezvous continues, Lab 5
09/10	SW Design, *A3 Due*	11/05	Stand-up 6, *M5 (Rendezvous) Due*
09/12	SW Design	11/07	Lab 6
09/17	Stand-up 1	11/12	Lab 6
09/19	Lab 1	11/14	Stand-up 7, *M6 Due*
09/24	Stand-up 2, *M1 Due*	11/19	Lab 7
09/26	Lab 2	11/21	Stand-up 8, *M7 Due*
10/01	Testing, *M2 Due*	11/26	Lab 8
10/03	Testing	11/28	NO CLASS: Thanksgiving Break
10/08	Stand-up 3, *A4 Due*	12/03	*M8 Due*
10/10	Lab 3	12/05	Clean-up
10/15	Stand-up 4, *M3 Due*	12/11	Launch (2:45 P.M. – 4:45 P.M. in ESSC-139)
10/17	Lab 4		

Software design mini-lectures ("SW Design") will be given throughout the course after the introduction on 09/10 and 09/12. Students will be notified via Slack.

The Rendezvous milestone listed 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:

First and foremost, you are required to have read the university's Academic Honesty Policy. This policy is stated in the BVU Student Handbook and the BVU Undergraduate Academic Catalog.

Do not cheat. If you feel like you are falling behind in the course, and because of this you feel compelled to cheat, please come and talk to me. Cheating will not be tolerated in this course.

Cheating consists of many things, including, but not limited to:

- Copying another student's work or allowing another student to copy your work. You are encouraged to talk with your classmates about solutions, but the final programming or written work should be your own.
- In this course, you are working on a team. You may only work within your own team. You may not work with other teams or view another team's work unless directed by your instructor.
- Copying work from other sources, include sources found on the Internet. Even if you copy another author's work from the Internet and change the names of variables and the arrangement of the code or mathematical expressions somewhat, it is still considered plagiarism even if the code or expressions do not match exactly. Consider the following analogy from a course in another discipline. Suppose you are in a creative writing course and you copy Shakespeare's Romeo and Juliet but you change the names of the title characters to "Ron" and "Julie." This is an example of plagiarism in much the same way that copying code or mathematical expressions and changing variable names and structure is plagiarism.
- During an exam, engaging in any form of communication with individuals or entities other than the instructor or a proctor designated by the instructor. These include written, oral, signing, signaling, electronic, mechanical, and other forms of communication.

If you are found to be in violation of the university's Academic Honesty Policy, the situation will be handled as follows. 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 according to the Academic Honesty Policy 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.

Expectations:

Check the `softeng19` 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.

	+/- Letter	P/F
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 minimum of two team presentations during the course. The dates for these presentations will be shared during the semester via Slack, and the requirements for the presentations will be posted to the course GitHub repository. The intent of the presentations 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 .   Please contact Donna Musel, Director of the Center for Academic Excellence (CAE) to begin this 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.