Worcester State University
Department of Computer Science

CS 348   **Software Process Management**   **Fall 2021**

Credit and Contact Hours

3 credits

Lecture: 3 hours/week

Catalog Course Description

Project management including planning, progress measurement, estimation, and risk assessment. Functional and non-functional requirements. Software licenses, contracts and intellectual property.

Instructor

Ali Al-Faris

Office Location: ST 110C, Computer Science Department

Email: aalfaris@worcester.edu

Meeting Time and Location

Section: 01

Day/Time: M/W 2:00 PM - 3:15 PM,
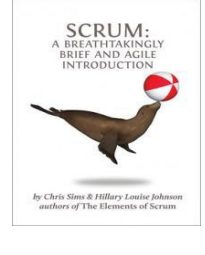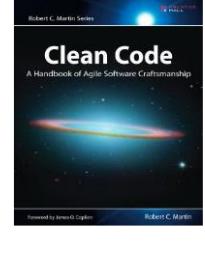
Location: Science & Tech, 103

Office Hours (Student Contact Hours)

Monday 10:00 – 11:00 am

Wednesday 9:00 – 10:00 am

Students should avail the scheduled "Student Contact Hours" for extra help and guidance. I will be glad to meet with you at other times (or Zoom times) if these times are not convenient to you. Students can contact me for requesting Zoom appointments outside of these times (provided it is not late in the evening, weekends, or holidays!!).

Textbooks

SCRUM: A BREATHTAKINGLY BRIEF AND AGILE INTRODUCTION *by Chris Sims & Hillary Louise Johnson authors of The Elements of Scrum*	Scrum: A Breathtakingly Brief and Agile Introduction Chris Sims and Hillary Louise Johnson Dymaxicon, 2012 ISBN-13: 9781937965044 Available as a $0.99 Kindle book Read the whole text online here
VERSION CONTROL by EXAMPLE ERIC SINK	Version Control by Example Eric Sink Source Gear, 2011 ISBN-13: 9780983507901 Free downloads available here
Clean Code: A Handbook of Agile Software Craftsmanship Robert C. Martin	Clean Code: A Handbook of Agile Software Craftsmanship Robert C. Martin Prentice Hall, 2009 ISBN-13: 9780132350884Website (See ACM Student Membership for a way you can get access to this textbook for no additional cost.)
It is strongly suggested that you have an ACM Student Membership. An ACM Student Membership costs only $19 and you get access to a large list of benefits, including Safari Books, which includes an electronic copy of Clean Code. The ACM is the world's largest educational and scientific computing professional society. As a soon-to-be professional in computing, you should be a member to keep up-to-date with advancements in the field. And it looks great on your resume!	

Where Does This Course Lead?

- CS 443 Software Quality Assurance and Testing

- CS 448 Software Development Capstone

- Your professional career

Course Workload Expectations

This is a three-credit course. You should expect to spend, on average, 9 hours per week on this class.

You should expect to spend, on average, at least 6 hours per week outside of class during the semester reading the textbook, accessing class preparation materials, studying, doing assignments, working on projects, and practicing in order to master the concepts and use of the language and modules covered in the course. (See Definition of the Credit Hour)

Definition of the Credit Hour

Worcester State University follow a modified Carnegie Foundation definition of the credit-hour, known as the "Carnegie Unit." For Worcester State courses, 1 credit hour is equivalent to 1 hour of classroom instruction coupled with a minimum of 2 hours of expected coursework outside of the classroom by the student, over a semester of approximately 15 weeks. Please note that "1 hour of classroom instruction" is actually 50 minutes. A 3-credit course would thus entail approximately 45 classroom hours of instruction (= approximately 37.5 actual hours in class) and a minimum of approximately 90 hours of work outside of class. This standard is maintained for a seven-week summer session and a two-week winter session, so that the 45 + 90 hours will be distributed over seven weeks or two weeks, depending on the session. Students receive one credit for each credit hour of courses taken.

Prerequisite

- **CS 140 Introduction to Programming**

This course has a prerequisite of CS 140 – Introduction to Programming. I expect that you should have a good knowledge of Java programs that involve core Java aspects. You should be able to perform testing on Java programs that involve inheritance and multiple files with simple JUnit tests. Additionally, you should have a basic idea of working with git.

Prerequisite or Corequisite

- **PH 134 Computing Ethics**

OR

- **UR 230 Technology, Public Policy and Urban Society**

This course has a prerequisite or corequisite of PH 134 – Computing Ethics or UR 230 – Technology, Public Policy and Urban Society. I expect that you understand the concept of intellectual property, including copyright and licensing. We will be reading and comparing software licenses, and determining what effect a software license has on how we can use third-party code, why it is important to license our own code and documentation, and what to consider when choosing a license for our own work.

If you do not have this background, you should not take this course.

Required Materials

In addition to access to the textbooks, to successfully complete this course, you will need:

1. **Laptop Computer:** You will need a laptop computer that you can bring to class sessions and can use at home. The brand and operating system (Windows, Mac OS, Linux) is unimportant – the software we will be using runs on all major operating systems and can be downloaded for free (except Chromebooks!). It

is expected that you will download and install required software as needed before or over the course of the semester.

2. **Internet Access:** You will need Internet access for access to:

   a) **Blackboard** – All course materials and announcements will be made available through the course site on Blackboard.

   b) **WSU Gmail** – You must check your WSU Gmail account on a regular basis. All communications to the class will be sent to your WSU Gmail account.

   c) **Tutorials and articles** – I will suggest, and you will research on your own, tutorials and articles for you to learn new technologies and techniques we need.

   d) **Zoom** – We may need to use Zoom (through your WSU login ID) to log

   e) **Google drive** – You will need access to Worcester Google drive (through your WSU login ID) to access team's POGIL (Process Oriented Guided Inquiry Learning) activities.

   f) Access to videos and tutorials on the Internet for class preparation materials.

Attendance

You are expected to attend every class. Past experience has shown that students who do not attend class do not do as well on exams and projects.

Since the class is activity based, it is particularly important that you attend class sessions and participate in developing the material and concepts with your group. Simply being present is not enough to really learn the material - you need to play your part.

During class time you are expected to participate in your group, to play your assigned role, and to contribute to your group's notes.

You will be using your computer within your group activities. You should only be using your computer for the classwork. You should not be checking sites that are unrelated to the course, or messaging friends. If I see that you are doing other things on your computer and not participating in your group, I will warn you. If I have to warn you a second time during that class, you will lose your participation points for that class.

For the full Worcester State policy on undergraduate student attendance, please go to https://catalog.worcester.edu/undergraduate/academic-policies-procedures/standards-progress/.

Course-Level Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- Elicit, organize, prioritize, and validate functional and non-functional requirements using a variety of techniques, and negotiate among different stakeholders in order to agree on a set of requirements

- Draft and evaluate basic software licenses, contracts, and intellectual property agreements, while recognizing the necessity of involving legal expertise
- Develop a comprehensive project plan, measure project progress and productivity, estimate costs, manage risk and change for a significant development effort
- Apply management techniques to projects that follow agile methodologies, as well as methodologies involve larger-scale iterations or releases
- Apply analysis techniques such as needs analysis, goal analysis, and use case analysis

LASC Student Learning Outcomes

This course does not fulfill any LASC Content Area requirements, but contributes to the following Overarching Outcomes of LASC:

- Demonstrate effective oral and written communication
- Employ quantitative and qualitative reasoning
- Apply skills in critical thinking
- Apply skills in information literacy.
- Understand the roles of science and technology in our modern world.
- Understand how scholars in various disciplines approach problems and construct knowledge.
- Display socially responsible behavior and act as socially responsible agents in the world.
- Make connections across courses and disciplines.

Program-Level Student Learning Outcomes

This course addresses the following outcomes of the Computer Science Major:

Upon successful completion of the Major in Computer Science, students will be able to:

1. Analyze a problem, develop/design multiple solutions and evaluate and document the solutions based on the requirements. (Emphasis)
2. Communicate effectively both in written and oral form. (Emphasis)
3. Identify professional and ethical considerations, and apply ethical reasoning to technological solutions to problems. (Emphasis)
4. Demonstrate an understanding of and appreciation for the importance of negotiation, effective work habits, leadership, and good communication with teammates and stakeholders. (Emphasis)
5. Learn new models, techniques, and technologies as they emerge and appreciate the necessity of such continuing professional development. (Emphasis)

Course Topics

The course outline will be covered on a best-effort basis, subject as always to time limitations as the course progresses.

- Version control
- Collaboration tools
- Project management
- Software process models
- Software testing
- Software licensing
- Documentation standards
- Software maintenance
- Team management
- Code review

Instructional Methods

This class will not be a traditional "lecture" class, and will incorporate some teaching methods that may be unfamiliar to you.

POGIL

Rather than lecturing about the course content, you and your classmates will "discover" the content for yourselves through small team work.

The team work will be a very structured style called Process Oriented Guided Inquiry Learning (POGIL). Through investigation of models of the concepts and answering questions that guide the team toward understanding of the models, your team will both learn the content and team process skills. In your POGIL teams each team member will have a specific role to play during the activity, and roles will be rotated so that everyone will get to experience a variety of process skills.

For more information on POGIL, see https://pogil.org/about-pogil/what-is-pogil

Grading Policies

I want everyone receiving a passing grade in this course to be, at least, minimally competent in the course learning outcomes and for that to be reflected in your course grade. Traditional grading schemes do a poor job of indicating competency.

As an example, imagine a course with two major learning outcomes: X and Y. It is widely considered that a course grade of C indicates that a student is minimally competent in achieving the course outcomes. However, if the student were to receive a grade of 100 for outcome X, and a grade of 40 for outcome Y, the student would still have a 70 (C-) average for the course. Yet the student is clearly not competent in outcome Y.

Therefore, the grading in this course will be handled in a different manner:

- All assignments will be graded on a *Meets Specification / Does Not Yet Meet Specification* basis, based on whether the student work meets the instructor- supplied specification.
- A minimum collection of assignments, indicating competency in the course learning outcomes, must be completed in a *Meets Specification* manner to earn a passing course grade (D).
- Higher passing grades (A, B, C) can be earned by completing more assignments and/or assignments that show higher-level thinking and learning skills.

Assignment Grading

- All assignments in this course will be graded exclusively on a *Meets Specification / Does Not Yet Meet Specification* basis.
- For each assignment, you will be given a detailed specification explaining what is required for the work to be marked *Meets Specification*.
- Failing to meet *any part* of the specification will result in the work being marked *Does Not Yet Meet Specification*.
- There will be no partial credit given.
- If you are unclear on what the specification requires, it is your responsibility to ask me for clarification.
- It will be possible to revise and resubmit a limited number of assignments with Does *Not Yet Meet Specification* grades (see Revision and Resubmission of Work below).

Course Grade Determination

Your grade for the course will be determined by which assignments/exams and/or how many assignments you complete in a Meets Specification manner.

Assignments

The assignments will give you a chance to apply the material to larger tasks. The assignments will vary in what you will be asked to do - programming projects, written assignments, analysis, etc.

Base Assignments

Every assignment will have a ***base assignment*** portion that must be completed for the assignment to be considered "**Meets Specification**". This will generally involve developing tests, determining suitable test inputs, and/or determining suitable test paths.

- Anyone working to earn a grade of C or higher must submit "**Meets Specification**" work for all Base Assignments.
- Anyone working to earn a grade of D or higher must submit "**Meets Specification**" work for **all but one** of the Base Assignments.

A more complete specification for an "Meets Specification" (passing) Base Assignment will be given during with each assignment.

Intermediate "Add-On"

Each assignment will also have an ***Intermediate Add-On*** portion that can be completed for anyone working for a course grade of C or higher. This will involve deeper understanding of the material or additional tasks.

- Differing numbers of Intermediate "Add-Ons" are required for different passing grades of C or higher. See the table under Course Grade Determination.

A more complete specification for "Meets Specification" (passing) Intermediate "Add- Ons" will be given during with each assignment.

Advanced "Add-On"

Each assignment will also have an **Advanced Add-On** portion can be completed for anyone working for a course grade of B or higher. This will involve even deeper understanding of the material or additional tasks.

- Differing numbers of Advanced "Add-Ons" are required for different passing grades of B or higher. See the table under Course Grade Determination.

A more complete specification for "Meets Specification" (passing) Advanced "Add- Ons" will be given during with each assignment.

Exams

There will be three exams, one of which will be a non-comprehensive final exam.

- Exam 1 is tentatively scheduled to be given in October, 2021.
- Exam 2 is tentatively scheduled to be given November, 2021.
- Exam 3 will be given during the scheduled final exam period:

Deliverables

All work must be submitted electronically through a variety of tools. The submission method, due date and time will be given on the assignment. The submission date and time will be determined by the submission timestamp of the tool used.

Please do not submit assignments to me via email. It is difficult for me to keep track of them and I often fail to remember that they are in my mailbox when it comes time to grade the assignment.

It is strongly recommended that you keep copies of your projects. Students are responsible for reproducing any lost work including unreadable files.

Graded assignments (with feedback) will be returned to you electronically. Please make sure that you review the comments/feedback, so that you can improve your future assignments. Ask me questions about the comments if you do not understand them.

Getting Help

If you are struggling with the material or an assignment / project please see me as soon as possible. Often a few minutes of individual attention is all that is needed to get you back on track.

By all means, try to work out the material on your own, but ask for help when you cannot do that in a reasonable amount of time. The longer you wait to ask for help, the harder it will be to catch up.

I am here to help you understand the material and be successful in the course.

Contacting Me

You may contact me by email (aalfaris@worcester.edu), or see me during my office hours (by appointment).

If you email me, please include "[CS 348]" in the subject line, so that my email program can correctly file your email and ensure that your message does not get buried in my general inbox. DO NOT reply to my announcements. Always compose a fresh email with proper subject line.

If you email me from an account other than your WSU Gmail, please be sure that your name appears somewhere in the email, so that I know who I am communicating with.

You may expect a response within 24-48 hours of your email (with the exception of weekends and holidays), although you will likely hear from me much sooner.

Student Responsibilities

- Contribute to a class atmosphere conducive to learning for everyone by asking/answering questions, participating in class discussions.
- Seek help when necessary.
- Start assignments as soon as they are posted. Do not wait until the due date to seek help/to do the assignments.
- Make use of the academic success center (see below).
- Expect to spend at least 9 hours of work per week on classwork.
- Each student is responsible for the contents of the textbook readings, handouts, exercises, quizzes, and homework assignments.
- Each student is responsible to constructively collaborate in their teams.

Student Accessibility Services

WSU is committed to providing equitable access and appropriate reasonable accommodations within courses and programs for students with disabilities. If you have a disability that requires reasonable accommodations, please visit the Student Accessibility Services' website https://www.worcester.edu/Student-Accessibility-Services/ , or contact us at SAS@worcester.edu , or call 508-929-8733, or stop by the office, Suite 131 in the Administration Building. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

Academic Success Center

The Academic Success Center is available to students who have advising and registration questions. The ASC works closely with Faculty Advisors to ensure students are supported with major and LASC information. The ASC also provides workshops for students to deliver academic advising information. Tutoring Services for a variety of courses are hosted in our area. We also offer testing services related to CLEP and Accuplacer Placement Test. General information about the ASC is available at https://www.worcester.edu/Academic-Support-Services/ The interactive ASC webpage is available through the student portal, "MyWSU."

The Writing Center

Worcester State University's Writing Center, staffed by friendly student consultants, is a space where students can have productive conversations about their writing. Student writers can take advantage of 30-45-minute synchronous or asynchronous appointments.

To set up an appointment, students can

- fill out the electronic asynchronous session Google form or
- drop in, call, or email the Writing Center for an in-person session.

For more information about our mission, policies, and employment opportunities, visit https://wooforwriting.wordpress.com/ . All services are offered free of charge.

Location - Sullivan 306

Typical Daily Hours - Monday thru Thursday 9am-6pm, Friday 9am-1pm

Semester Hours (fall and spring only) - Open at the beginning of the third week. Close the day before Reading Day.

Email - writingcenter@worcester.edu

Office Phone - (508) 929-8112

The Math Center

The WSU Math Center provides services to enhance student learning and success in any course with mathematical content, including Business, Computer Science, Psychology, and Math Courses up through Calculus II (MA 201). Placement test materials and preparation support are also available. The trained tutors have taken the course they tutor for and understand the material well. Tutoring will be in the WSU Math Center located in Sullivan 140 for fall 2021 semester and will be overseen by Math Professor Eileen Perez. Tutoring will begin the Monday of the first full week of each semester and will be published by the center at https://www.worcester.edu/SP-Math-Center/ . The schedule is also available from your professor in these courses or by emailing the math department admin at etracy1@worcester.edu . Contact Professor Perez if you have questions or need assistance (eperez2@worcester.edu).

COVID-19 Mask Requirement

Because of the continuing challenge of the COVID-19 pandemic, every student, faculty, and staff member at Worcester State is required to wear a mask or face shield that covers both nose and mouth at all times in buildings. You will not be allowed to enter any campus building, including to attend class, if you are not wearing a mask or cloth covering. If you have a medical condition where a mask cannot be worn, you will need to ensure that your class schedule is made up of classes in which you can participate fully online. This requirement is in place to protect you, your fellow students, your professor, and other members of our community from COVID-19. Failure

to comply with state, local and University health directives and precautions jeopardizes the health and safety of the University community and is a violation of the University's Code of Conduct. Violations may result in sanctions up to and including expulsion from the University. For more details on this and other COVID-19-related issues, go to https://www.worcester.edu/SafeReturn/#technology

Statement on Use of Course Materials

Unless otherwise indicated, all course materials, including but not limited to video recordings, audio recordings, transcripts, physical documents, electronic documents, and creative works, are the intellectual property of the instructor and/or Worcester State University. Course materials can be used only for individual educational purposes within the course, as defined by the instructor. Without authorization, no copying or dissemination of course materials is permitted.

Sharing Course Materials Online Is Prohibited

A number of websites offer students opportunities to share course materials from their classes and to access course materials posted by others. Unless another copyright holder is indicated, all hardcopy and electronic course materials are copyrighted by the course instructor and/or Worcester State University, whether this is stated on a given material or not. Any sharing of course materials through a website or other means outside of the approved activity of the course as determined by the instructor and without the instructor's express written permission is prohibited and may subject the individual sharing that material to legal action and discipline pursuant to the Worcester State Student Code of Conduct.

Help for Students from the Counseling Center

The Worcester State University Counseling Center is here to provide confidential, therapeutic support to students with mental health concerns and/or facing pressures unique to college students. Services are also provided to students that are in crisis. Your instructor is available if you would like guidance in seeking services. Your instructor may also consult with a Counseling Center staff member and/or make a referral on your behalf. You can contact the center directly via email counseling_WSU@worcester.edu or via telephone at (508) 929-8072.

Academic Honesty

Academic Honesty is an important foundation of a teaching and learning community and taken very seriously by Worcester State University. For the full statement of the Academic Honesty Policy, please go to https://catalog.worcester.edu/undergraduate/academic-policies-procedures/academic-honesty/ . Among other elements, this policy includes definitions of relevant terms such as "plagiarism" and student appeal procedures.

Please note that there are three main ways that academic dishonesty is dealt with at Worcester State. First, instructors may impose sanctions within a course, which might include such things as mandatory rewrites or reduced or failing grades. Second, in conjunction with what they do in class, instructors may file reports of academic dishonesty instances in the Academic Central File. Such reports form a record of conduct that is tracked at the university level, and allows both instructors and the Worcester State administration to determine if a student has been reported for multiple violations. While having a report filed in the Academic Central File about one's academic dishonesty does not in itself carry any penalty for the student, reports in the file can be used for evidence in formal judicial processes. In addition, faculty members can request to be told if a student has a prior report on file and the Worcester State administration can institute formal judicial processes based on Academic Central File reports.

Worcester State University Laptop Requirement

Worcester State University requires all full-time undergraduate students to have laptop computers. Through the Laptop Purchase Program, you can take advantage of special pricing on hardware from Apple and Dell that we have vetted for durability, reliability, and supportability. When you purchase a laptop through this program, we provide on-campus support free of charge and a complete-care warranty for the length of the manufacturer's warranty. Go to https://www.worcester.edu/Laptop-PurchaseProgram/ for more information.

IT – Information Technology Services

If you need help with a computer, email, Blackboard, or another technology issue, IT is there for you! Help Desk: Located in the Learning Resource Center Room: LRC-310, Phone: 508-929-8856

IT Services: If you need any assistance, you may submit a ticket to the IT Help Desk, by going to http://www.worcester.edu/it and clicking the "Submit a Help Desk Ticket" button. You can also find help desk office hours for the semester at this link.

Laptop Support: If your laptop needs repairs, you can drop it off at the Laptop Repair Depot, located on the 3rd floor of the LRC. It typically takes 24 to 48 hours to complete a repair.

myWSU Portal: Classes, OneCard, WebAdvisor, Gmail, and, soon, Self-Service with Student Planning are all accessible through this portal.

Free Software Download: Available for download at https://apps.worcester.edu/MSDNAA_E5/Prompt.aspx Windows 8.1, and 10. The Adobe Creative Suite can also be obtained at low cost here.

Microsoft Office: This software can be downloaded at www.office365.com for FREE. Click "Sign In" at the top righthand corner of the screen and use your WSU email address and password, in order to gain access to the download.

Worcester State University Library

Contact or visit the Library for research help. The Worcester State University Library, located on the second and third floors of the Learning Resource Center, provides access to print materials and items on course reserve. Access a wide variety of full-text online resources including e-books, journal articles, newspapers, and magazines via the Library's website, https://www.worcester.edu/library/ . Articles and book chapters not available from the Library may be obtainable from other libraries by using Interlibrary Loan (ILL), https://www.worcester.edu/Interlibrary-Loan-Desk/ .

WSU librarians can help you identify research strategies, develop research questions, search for relevant and reliable information and data, select sources, and cite information. A librarian can visit your class, or meet with you one-on-one or in groups (in-person and online). While all librarians help students with projects in any discipline, each academic department has a designated liaison librarian who provides customized services to students in that department. Locate liaison librarians and make an appointment by visiting the Ask a Librarian page, https://libguides.worcester.edu/askus. See the Library's Safe Campus page, https://libguides.worcester.edu/SafeReturnLibraryServices , for the most up-to-date information about Library services.