CIS*3760 Software Engineering

Fall 2022 Section(s): C01 School of Computer Science Credit Weight: 0.75

Course Details

Calendar Description

This course is an examination of the software engineering process, the production of reliable systems and techniques for the design and development of complex software. Topics include object-oriented analysis, design and modeling, software architectures, software reviews, software quality, software engineering, ethics, maintenance, and formal specifications.

Pre-Requisites: CIS*2750, CIS*3750

Course Description

Students will work as a team to design and create software systems based on the instructor's specifications and guidelines, keeping each other on track, setting and meeting milestones, and choosing appropriate software (open source libraries to assist development, version control, documentation, etc.).

Timetable

The lecture and lab periods will be used to present course material, project requirements, and for meetings between the student teams, the instructor, and TAs. These meetings will include presentations, demos, sprint retrospectives, and code reviews. The instructor will schedule the retrospective meetings with teams during scheduled lecture and lab times.

Final Exam

No final exam.

Instructional Support

Instructional Support Team

Instructor: Greg Klotz, Ph.D. cis3760@socs.uoguelph.ca

Teaching Assistants: cis3760@socs.uoguelph.ca

Office Hours: TBA on CourseLink

Learning Resources

Required Resources

CourseLink (Website)

https://courselink.uoguelph.ca

Meeting information: all meeting schedules, including dates, times, and teams will be posted online.

Evaluation details: the details on all evaluation components for this course will be made available on the course website.

Learning Outcomes

By the end of this course, you should be able to:

1) Explain and use the procedures involved in software design and development.
2) Select and use suitable modeling techniques for planning and designing a software project.
3) Analyze problem specifications and integrate into suitable software requirements and design models.
4) Select and use suitable software architectures and design patterns for common software problem.
5) Select and use suitable testing methods for verifying and validating a software project.
6) Identify sources of risk in software projects, and select and use mitigation strategies in solution designs.
7) Describe effective project management and team behaviours and evaluate your contributions.

Teaching and Learning Activities

Assessments

Marking Schemes & Distributions

Teams will use https://git.socs.uoguelph.ca to plan the sprint and work on deliverables. Code, designs, tests, plans, etc. will be added to the team project and tracked with a burndown chart and comments.

Assessment Details

9 Weekly Sprints (100%)

Teams will work together creating deliverables for 9 sprints. Sprints start at 12:00PM Monday when the sprint goals for that week are shared on CourseLink. Sprints end at 11:00AM Monday the week after. The sprint is frozen on GitLab, and a new sprint is started. The instructor or Tas will meet with each team for a sprint retrospective in the week the sprint ended to discuss design decisions, do code reviews, etc. There are 9 sprints instead of 10 or 12 because we are not starting a sprint during the first week or right before the Study Break week. Graded sprints will be held on weeks starting Sept 12, Sept 19, Sept 26, Oct 17, Oct 24, Oct 31, Nov 7, Nov 14, and Nov 21; and graded the week following during sprint retrospective.

- **Each sprint is worth 100 / 9 of the final grade.**
- Grading for the sprint will be assigned using University of Guelph grading policies
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- For example, if the sprint task for the week is to complete task A and the team completes the bare minimum of task A and it works, the grade will be a D (53 to 56%). **This is grade X.** The team can increase the grade by adding extra features to A, add great test

coverage for their code, ensure their code is well documented, the project is well documented, code works cross platform (Windows, Mac, Linux), easy to install, etc.

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- At the start of the sprint, each team will create tasks to complete for the week with assigned weights on Gitlab. A weight of 1 means that for most 3rd year Computing students that task requires 30 minutes of work. Team members should aim to complete 20 weights of work each week (ten hours). Tasks should be broken up into reasonably small tasks, at most weight 4 so all team members have a chance to work on a variety of tasks. All team members need to attend team retrospectives and be prepared to discuss their work. **The weight of completed tasks by a student divided by 20 is multiplier Y.**
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- **A student's sprint grade is: the team's sprint grade X * multiplier Y.**
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- For example, if the team had a great sprint and the team sprint grade is 8/10, and the student completed 10 weights of tasks, their grade is 8 * (10/20), so 4. Another student on the team who completed 20 weights has a grade 8 * (20/20), so 8.
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- **Unless a student is making up approved work missed due to illness the maximum Y multiplier is 1.0. If a student completes 40 tasks during that sprint their grade is still 8, not 16.** If your team is repeatedly in this situation it suggests the team is not working well together and a new team will be assigned.
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- **If a student does not participate in their team retrospective their sprint grade will be adjusted: grade as above * 0.6.** Using the example above, 8 * (20/20) * 0.6 = 4.8. **If you can't participate in the retrospective due to illness etc. and you inform your team and grader ahead of time, the grader will try to schedule a one on one retrospective with you at an alternate time.**
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- **You will also lose grades for being late for the retrospective.**
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- At the instructor's or TAs discretion grades may also be lost during sprint retrospective for presenting badly organized or commented code, designs, etc. or for not being prepared for the presentation and discussion.
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- The instructor or TA can also change task weightings at any time, even retrospectively. If a student completes a task with weight 4 (2 hour task) but most 3rd year Computing students could complete it in half an hour, it will be re-weighted to 1 even if the student spent two hours on it. (I don't expect this to actually happen often, but you need to assign task weightings appropriately.) All completed weighted tasks must have deliverables attached on GitLab: code, documentation, readme.txt, research notes, meeting minutes, etc.
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- **The team lead for the week is responsible for ensuring tasks are weighted properly, and can lose grades if they are not. They do not assign work.**
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- Only completed tasks are counted. If you start a task weight 2 but don't complete it by the end of the sprint that is assigned a weight of 0, not some fraction of 2.

Course Statements

Teams and Weekly Team Leads

Teams and weekly team leads will be assigned by the instructor. Teams may be changed at any time by the instructor. The team lead for the week will spend most of their time supporting the team, making sure sprint planning happens, issues with weights are created on day one, facilitating meetings, making sure everyone is working effectively, ensures the burndown chart is up to date, and prepares for the demo and retrospective. Everyone will be team lead at least once. All team members submit a slide to the team lead for the retrospective presentation highlighting their work and completed points. **Team leads to not assign tasks.**

Making up work missed due to illness

If a student misses course work due to illness or other academic consideration reasons they will be graded for missed work as usual. For example, if a student does not participate in Sprint 3 their grade multiplier will be 0, and they will get 0 on that sprint. After discussion with the team and instructor, the student can take on extra work in Sprints 4, 5, and 6 to increase their grade multiplier up to 1.3 for those sprints.

Task weights during the sprint

Teams will create tasks and assign weights to them at the start of the sprint. A task with weight 1 means that most 3rd year Computing students would need 30 minutes to complete that task. The instructor or teaching assistant reserves the right to change task weights at any time, even after the sprint is over. For example, if a student assigns a weight of 4 (2 hours) for a task that most 3rd year Computing students can do in 30 minutes, that task will be re-weighted to 1 even if the student spent 2 hours working on it. The team lead for the week is responsible for ensuring tasks are weighted properly and can lose grades if they are not.

It’s also possible for a 4 point task to become much larger after you start. You would want to break it up into multiple tasks with new weights after discussing it as a team and include other team members on the work.

University Statements

Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Graduate Calendar - Grounds for Academic Consideration
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml

Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

For Guelph students, information can be found on the SAS website
https://www.uoguelph.ca/sas

Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars
https://www.uoguelph.ca/academics/calendars

Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings and academic schedules. Any such changes will be announced via CourseLink and/or class email. All University-wide decisions will be posted on the COVID-19 website (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.