CIS 3250 – Software Design III (Fall 2022), 0.5 credits

Lectures (hybrid): MWF 8:30am-9:20am, MCKN 121
(Lectures will also be livestreamed through Zoom; see CourseLink for connection details)
Laboratories (in person): **Section 1:** Thu 11:30am-2:20pm, THRN 2420
Section 2: Fri 11:30-2:20pm, THRN 2420

Instructor: Prof. Stacey D. Scott (she/her), Professor, School of Computer Science
Office: Reynolds 3308; Email: stacey.scott@uoguelph.ca; Phone: 519-824-4120 ext. 54153
Office Hours: Virtually, TBD (will be based on a poll of students' availability)

Teaching Assistants: Hillary Dawkins, Brandon Lit
Email: cis3250@socs.uoguelph.ca

Contact: Use cis3250@socs.uoguelph.ca email for all course-related concerns. Use course discussion boards for assignment or lecture content questions. For emergency issues, email Prof. Scott directly.

Course Delivery Notes:

Due to ongoing concerns and potential disruption due to COVID-19, this course will be taught in a mix of in-person (when safe) and virtual formats.

Lectures will be offered in a hybrid format (we'll try this!). Prof. Scott will teach in person in our assigned classroom, MCKN 121. The lecture will be livestreamed through Zoom from the classroom. Students can join in person or remotely. Prof. Scott will try her best to facilitate online student interaction in addition to in person engagement. Zoom chat will be the main vehicle for online student interactions during real-time lectures. All chat interaction MUST be kept appropriate and on topic. Any uncivil / in appropriate behaviour may result in a student being kicked out of the Zoom meeting, at Prof. Scott's discretion. To accommodate students with health concerns or life complications arising from COVID or otherwise, course materials will be posted online whenever possible.

Labs will conducted in-person, with necessary shifts to online/virtual as needed due to COVID disruptions.
- **Lab participation is mandatory.** Labs will provide a shared time and space for individuals and groups to meet with the instructional team and work on course deliverables. When applicable, groups will meet in person to facilitate group discussions and work sessions.

Midterms/Tests and Final Exam delivery format:

This course has two (2) scheduled midterms (tests) and one scheduled final exam that will be delivered in the following formats:
- Midterms will be conducted **in person in our regular classroom (MCKN 121)**. If you are at higher risk and are not comfortable writing a test in a typical "close contact" situation, let Prof. Scott know as soon as possible (at least TWO WEEKS before the scheduled midterm), and we will work together to find a suitable solution, or register with *Student Accessibility Services*.
- Final Exam will be a **TAKE HOME / online format**. As per University of Guelph policies, you will have 72 hours to complete the exam after it is released via CourseLink.

If you have health issues or life circumstances that that warrant **accommodation**, please contact *Student Accessibility Services* as soon as possible. Also, if your circumstances warrant complete virtual participation in this course, please contact me as soon as possible to discuss options for completing the course work, especially the teamwork aspects of the course.

Course Website: http://courselink.uoguelph.ca (Login with Central login ID and password)
The course website will be used to provide:
- *informational materials* (e.g., videos, lecture notes, assignment handouts, course updates)
- *electronic drop boxes* for non-programming course deliverable submissions
- *course discussion boards* for asking questions and discussing issues related to course material

Required Text: Steve McConnell (2004). *Code Complete, 2nd ed.*, Microsoft Press.

Course Communications:
1. For *lecture, assignment, or general course questions*, post to the *"CIS 3250 Course Questions" Discussion board* on the course website. Or talk to Prof. Scott or your TAs during lectures or labs.
2. For *personal issues*, email Prof. Scott or drop into her (virtual) Office Hours (via Zoom).

Calendar Description:
This course will examine the historical development of design methodologies and working with legacy systems. It will include an examination of programming paradigms and trends in software design from the past and present. The course has an applied focus and will involve software design and development experiences in teams, a literacy component, and the use of software development tools.
Prerequisites: CIS 2250, CIS 2500

Course Objectives:
CIS 3250 aims to provide students a strong foundation in **project management**, **teamwork**, and **essential design theory**, as well as **software engineering tools**. Achieving this goal requires learning *modern tools* to *manage team-based software projects and group communications.* You will gain experience with these concepts by working with **legacy software** in a **large team context**. By the end of the course, you should be able to:
- *Select* and *Use* effective practices and tools for managing software projects
- *Select and Use* appropriate methods and tools for tracking and controlling changes in software engineering projects (i.e. configuration management)
- *Describe* effective team behaviours and dynamics, and mitigation strategies for team breakdowns
- *Explain* and *Use* effective strategies for team communication and coordination in software projects
- *Explain and Use* effective strategies for programming in a team context
- *Explain* and *Use* effective strategies for generating and evaluating alternative design solutions at different stages of the software engineering process

Course Topics (tentative, subject to change, check CourseLink for updates):
- Course Introduction
- *Module I – Working in Software Teams*
  - Teamwork Basics
  - Communication and Coordination Skills and Tools
  - Team Diversity and Mutual Respect
  - Collaborative Construction
- *Module II – Project Management in Software Engineering*
  - Project Management Basics
  - Managing Construction & Configuration Management
  - Project Scheduling and Management Tools

- *Module III – Managing Complexity and Considering Alternatives in Software Design*
  - Planning, Design Alternatives, and Managing Complexity
  - Alternatives in Software Testing – Testing Basics
  - Alternatives in Programming Languages

Grading Scheme:
- *Theory (60% in total):*
  - Tests (2): 30% (15% each)
  - Final Exam: 30%
- *Practical (40% in total):*
  - Assignments (individual and team components): 35%
  - Peer Assessments: 5%

Midterm Tests and Final Exam
Midterm Tests

There will be two tests during the term to evaluating learning of concepts throughout the term, roughly after Module I and Module II. Tests will be conducted in person, during regular class time.

- Test I will be held during regular class time on Friday, October 14th.
- Test II will be held during regular class time on Friday, November 11th (note, Remembrance Day is not a holiday in Ontario)

Final Exam

The final exam will be given in take-home format. Submitted exams will be screened through Turnitin, integrated with the CourseLink Dropbox tool, to detect possible plagiarism, unauthorized collaboration or copying (see Turnitin section below for more details). **Prof. Scott reserves the right to conduct oral interviews with students after exams have been submitted to discuss their exam content. Students who cannot provide satisfactory explanations for their responses may have their Exam marks adjusted accordingly, potentially to 0.**

- Final exam will be issued on Wednesday, December 7th.
- Final exam will be due on Saturday, December 10th.

Assignments & Peer Assessments

There will be **five (5) assignments** in this course, worth 35% of the term grade, including team and individual components. Individual accountability reports are included in this grading component.

1. Project management and configuration management (2%) – due in lab week 2
2. Working with a large, shared code base in C: Part I – code review (5%) – due in lab week 4
3. Working with a large, shared code base in C: Part II – pair programming and team consolidation (5%) – due in lab week 7
4. Case Study of Software Project Gone Wrong, including peer critiquing (10%) – due in lab week 9 (team component), week 11 (indiv. component)
5. Unit testing (8%) – due in lab week 12

*Individual Accountability Reports (5% in total) – due with each team-based deliverable

Three (3) peer assessments will also be completed by groups throughout the term, worth a total grade of 5%.
Peer Assessments (5% in total) – due Oct 3, Nov 7, and Nov 28

*Note, for all team-based deliverables, each team member must submit an **individual accountability report** to describe their individual learning and contribution to the deliverable. The instructor reserves the right to apply a fraction of the team grade to an individual team member without sufficient evidence of contribution to the team effort. See Policies on Required Coursework below.*

Estimated Weekly Course Commitment (10-12 hours per week for this 0.5 credit course):
- 3 hours lectures
- 3-4 hours independent study (e.g. readings, academic tasks)
- 3 hours labs
- 1-2 independent lab preparation (video tutorials, readings, reviewing assignment instructions)

University of Guelph expects students to spend 10-12 hours per week on a 0.5 credit course. This time commitment represents student workload rather than contact hours. In CIS 3250, a key learning vehicle are the course assignments, and related lab activities. The weekly lab times will be primarily used for mini-tutorials, reviewing assignments, TA-mentored time to help individuals and groups complete assignment work. Thus, **LABS ARE MANDATORY. Individual accountability marks** will be given to assess **individual reflection, learning, and contribution to group deliverables**.

Policies on Required Coursework:

Chat Etiquette in Virtual Lectures and Labs
To create an effective and professional learning environment using the online Zoom platform, all students must follow the below-listed class rules. Students who don't follow these rule may be removed from the meeting to minimize class disruptions:
- Login with a Zoom account linked to your **uoguelph.ca** account.
- Use your **real name** (i.e. the name that would appear in CourseLink). If you have a preferred nickname, use both (e.g. Yu-ling (Betty) Chang), where "Betty" would be your preferred name. You can use the "Rename" option beside your account name in the Participants panel/tab (e.g. select "More" beside your name in the desktop Zoom, or tap your name in the mobile app).
- Use professional, non-abbreviated language in the chat. **Chat should be treated as if you were speaking, out loud, in class,** for example, when asking a question to the instructor, or responding to a question posed to the class. Please treat this as professional communication with your class community, not casual chatting with your friends.
- Only post chat messages relevant to the class.
- No profanity.

Accommodation: When You Cannot Meet a Course Requirement
- When you find yourself unable to meet a course requirement because of illness or compassionate reasons, please advise Prof. Scott (or the TAs) in writing, with your name, id#, and e-mail contact. **See the undergraduate calendar for information on regulations and procedures for Academic Consideration.**

Late or Missed Assignments/Deliverables:
- **0%** will be given for any late or missed assignments or deliverables. **No extensions** will be given after a submission date.

Missed Exam:

- **0%** will be given for a missed **midterm exam**. If accommodation is warranted (see "Accommodation" policy above), the midterm mark allocation (15%) will be redistributed to the final exam (i.e. the final exam will then be worth 45% instead of its original 30%).
- If you miss the **final exam**, you must talk with your academic counsellor and follow University of Guelph policies on this matter. Prof. Scot cannot do anything in this situation.

Marking of Team-Based Deliverables:
- By default, marks for all team-based deliverables will be applied to all group members. However, the **instructor reserves the right to assign individual students a fraction of the total group mark** on any team-based deliverable without sufficient evidence of a student's contribution to the group effort. The **onus is on each individual student** to provide evidence of their individual contribution to the team effort. The instructor reserves the right to apply fractional grading **retroactively at the end of the term** to one or more team deliverables if **individual accountability reports**, **peer assessments**, or **team deliverables** lack sufficient evidence of contribution to team-based deliverables.
- If a team feels that lack of effort by one or more group members is negatively impacting the group's ability to meet the expected outcomes for the course, the situation **MUST be identified to the course instructor or TAs PRIOR to any impacted deliverable** to be considered for accommodation in deliverable grading. Otherwise, default grading criteria will be applied (e.g., the submitted deliverable will be assessed on the basis of a full team effort). Group members must submit a written request for accommodation, PRIOR to the deliverable deadline, detailing the situation. Note that submission of an accommodation request is not in and of itself approval.
- **It is the responsibility of ALL team members to ensure the accuracy and quality of all aspects of submitted team-based deliverables**. Therefore, any academic integrity offences arising from a team-based deliverable will impact ALL group members.

Re-grading of Marked Components:
- Any request for re-grading of a marked course component must be **submitted in writing no later than 1 week** following return of the marked component. A detailed rationale for the request must be included in the written request. The instructor reserves the right to re-grade the entire deliverable component, not just the requested component.

Accommodation:
- If you are unable to meet a course requirement due to medical, psychological, or compassionate reasons, please make an appointment to meet with Prof. Scott. Please see below for specific details and consult the undergraduate calendar for information on regulations and procedures for Academic Consideration: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml
- If you are unable to meet a course requirement due to religious obligations, please email Prof. Scott **within two weeks of the start of term** to make alternative arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

Calculation of Final Grade / Failed Final Exam or Individual Portion of the Course:
You must achieve a passing grade (**50% or more**) in each of the **Theory** and **Practical** sections to pass this course. A failing total in either of the above two sections will result in a final grade in the course equal to that failing total, to a maximum of 45%. Otherwise, your final grade is the weighted sum of all marked coursework as shown in the **Grading Scheme** section of this document.

In summary, your final grade will be calculated as follows:

> **if (you fail the Practical section of the course)**
>> **then** final grade = (weighted sum of Practical components in Grading Scheme) * / 40 * 100, to maximum of 45%
>
> **else if (you fail the Theory section of the course)**
>> **then** final grade = (weighted sum of Theory components in Grading Scheme) * / 60 * 100, to maximum of 45%
>
> **else** // (you passed Practical AND Theory sections of the course)
>> **then** final grade = weighted sum of all components in Grading Scheme

Communications Policy:

All course communications should follow the following guidelines:

- As per university regulations, all students are **required to check their <uoguelph.ca> e-mail account regularly**. E-mail is the official route of communication between the University and its students.
- **Always use your uoguelph.ca account** when emailing Prof. Scott or the TAs (i.e. when emailing cis3250@socs.uoguelph.ca). This provides an authentic email address. Also, always **include the course number (CIS 3250)** along with a relevant topic in the subject line.
- Address your email appropriately (i.e. "Dear Prof. Scott / Professor / Hillary / Brandon …")
- Sign your email with your first and last name, and your student number. If you have a nickname, include that also, e.g., Yu-Ling (Betty) Chang.
- Use **professional, respectful language**. Email containing crude or coarse language will not be answered.
- Allow 24-48 hours for a response to your email or questions posted to the course Discussion Boards.
- Email should be used for brief questions that can be answered quickly. Please use office hours, or a scheduled appointment with Prof. Scott or a TA for detailed discussions.

Roles, Responsibilities, and Expected Behaviour

Recording and sharing of course materials

Presentations which are made in relation to course work—including lectures—**cannot be recorded or copied without the permission of the presenter (instructor, classmate, or guest lecturer); see below for implicit permission given for recording of voluntary discussion participation**. Material recorded with permission is restricted to use for that course unless further permission is granted.

Do not redistribute recorded interactive discussions that involve any member of our course (instructor, your TAs, your classmates). This includes advising times and question and answer sessions with the instructor/TAs.

Online activities such as advising times, question and answer sessions, and interactive lectures may be recorded by the instructor or TAs and posted to CourseLink. **By taking this course you are agreeing that your participation in these activities can be used in this manner. If you do not wish to have your image or voice recorded as part of these activities, then either do not take this course OR do not ask questions during these activities. Note, the recordings of livestreamed lectures will show a view of the FRONT of the classroom only (the instructor, the white/chalk board, the presentation slides).**

Instructional Team's Role and Responsibility to Students

The instructional team's (instructor and TAs) role is to develop and deliver course material in ways that facilitate learning for a variety of students. Selected notes will be made available to students on the course website but are not intended to be stand-alone. During lectures and labs, the instructional team will expand and ex-

plain the content of notes and provide example problems that supplement posted notes. Scheduled classes and labs will be the principal venue to provide information and feedback for exams and assignments. The instructional team is also responsible for providing a safe and inclusive learning environment. See Code of Conduct below.

Students' Learning Responsibilities
Students are expected to take advantage of the learning opportunities provided during lectures, labs, and advising times. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed as early as possible. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

Students are expected to keep copies of all course deliverables they have submitted. Students may be asked to resubmit deliverables at a later time.

Mental Health
University of Guelph course instructors and student services cooperate to assist in helping students manage course and life stressors. Help is also available through counselling services. Please see the Mental Health Resources page for details: https://wellness.uoguelph.ca/counselling/mental-health-resources.

Accessibility
The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact Student Accessibility Services (SAS) as soon as possible.
For more information, contact SAS at 519-824-4120 ext. 56208 or visit the SAS website.

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

Copies of out-of-class assignments
Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

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

Ethical Behaviour[1]
Ethical conduct in the (physical or virtual) classroom and in academic work are critical to a healthy learning environment. Ethical conduct in all areas of University work is taken very seriously at the University of Guelph.

Code of Conduct
Our learning environment must be a friendly, safe, and welcoming environment for all, regardless of ethnicity, gender, sexual orientation, ability, socioeconomic status, and religion (or lack thereof). As we wish to facilitate and encourage the fullest participation from everyone, this code of conduct outlines the expectations for all participants (including the instructor and other staff). This code of conduct is aligned with the University of Guelph's policy on Non-Academic Misconduct (https://www.uoguelph.ca/secretariat/office-services/student-judicial-services/non-academic-misconduct/policy-non-academic-misconduct).

Expected Behaviour
- Participate in an authentic and active way. In doing so, you contribute to the health and value of this community.
- Exercise consideration and respect in your speech and actions.
- Attempt collaboration before conflict.
- Refrain from demeaning, discriminatory, or harassing behaviour and speech.
- Be mindful of your surroundings and of your fellow participants. Alert community leaders (for example, your instructor) if you notice a dangerous situation, someone in distress, or violations of this Code of Conduct, even if they seem inconsequential.

Citizenship and Participation
Communities mirror the societies in which they exist and positive action is essential to counteract the many forms of inequality and abuses of power that exist in society. If you see someone who is making an extra effort to ensure our community is welcoming, friendly, and encourages all participants to contribute to the fullest extent, we want to know.

Unacceptable Behaviour
Unacceptable behaviours include: intimidating, harassing, abusive, discriminatory, derogatory or demeaning speech or actions by any participant in our community, either in person, online, at any related events, or in one-on-one communications carried out in the context of community business. **Harassment includes**: harmful or prejudicial verbal or written comments related to race, religion, disability, gender, sexual orientation; inappropriate use of nudity and/or sexual images in public spaces (including computer labs and presentation slides); deliberate intimidation, stalking or following; harassing photography or recording; sustained disruption of talks or other events; inappropriate physical contact, and unwelcome sexual attention.

Consequences of Unacceptable Behaviour
Unacceptable behaviour from any community member, including the course instructor and those members with decision-making authority, will not be tolerated. **Anyone asked to stop unacceptable behaviour is expected to comply immediately.** If a community member engages in unacceptable behaviour, action will be taken to ensure that such behaviour ends, beginning with action on the part of the course instructor, and es-

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[1] This "Ethical Behaviour" section is based on content developed by SoCS's professor Dr. A. Hamilton-Wright, which was in turn developed based on the citizen code of conduct available via http://citizencodeofconduct.org, and is distributed under a Creative Commons Attribution-ShareAlike license (http://creativecommons.org/licenses/by-sa/3.0/).

calating if necessary. Additional information on University policy regarding harassment, conduct and human rights is available at the following web page: https://www.uoguelph.ca/diversity-human-rights/

If You Witness or Are Subject to Unacceptable Behaviour
If you are subject to or witness unacceptable behaviour, or have any other concerns, **please notify the course instructor as soon as possible**. If you feel that the course instructor cannot or will not provide remedy for the situation, please contact any of these alternate resources:
- Associate Director (Undergraduate) <ugraddir@socs.uoguelph.ca>
- Director of the School <director@socs.uoguelph.ca>
- Associate Dean (Academic) <kgordon@uoguelph.ca>
- Office of Diversity and Human Rights <dhrinfo@uoguelph.ca> or extension 53000
- Campus Community Police at extension 52245

Academic Integrity & Academic Misconduct
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 discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

It is **your responsibility to read and be familiar with the academic regulations** of the University as presented in the Calendar. Ensure you have a complete understanding of the concepts as described in the "Academic Misconduct" subsection within Section VIII "Undergraduate Degree Regulations and Procedures" in the Calendar: https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures. It is your responsibility to accurately and clearly indicate the work of **any and all contributing people**, including yourself, in all presented and submitted materials. By handing in any work for this course, unless you have specifically identified any other authorship, **you are claiming that the sole authorship is your own**.

Please note: Whether or not you intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse you from responsibility for verifying the academic integrity of your work before submitting it – this includes submitted team-based deliverables. If you are in any doubt as to whether an action on your / your team's part could be construed as an academic offence you should consult with your course instructor.

Turnitin (Plagiarism detection software)
In this course, your instructor will be using Turnitin, integrated with the CourseLink Dropbox tool, to detect possible plagiarism, unauthorized collaboration or copying as part of the ongoing efforts to maintain academic integrity at the University of Guelph. All submitted assignments will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site.