

SE390 – SE Capstone Design Project Planning, Fall 2023

Version history:

- Version 1, Sep. 6, 2023

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The goal of se390 is to define and begin your Capstone Design Project.

se390 Calendar Description: Students undertake a substantial customer-driven group project as part of the se390/490/491 design-project sequence covering all major phases of the software-engineering lifecycle. Lectures describe expectations and project-planning fundamentals. Students form groups, decide on a project concept, complete a project-approval process, develop high-level requirements for the project, perform a risk assessment, develop a test plan, and complete a first-iteration prototype. Social, legal, and economic factors are considered.

NOTE: “Customer-driven” is to be interpreted broadly as having clearly-identified team-external stakeholders benefiting from the project results. Examples include a contracting-style customer, new product users, advance technology users, or a research community.

Capstone Design Project

The intended learning objectives of the Capstone courses are, among others (see SE Capstone Handbook, §1, referenced in “Online course resources” for more detail):

- Project selection:
 - To identify problems worth solving
 - To identify personal tastes and preferences
 - To make strategic decisions
 - To be proud of your project
- Teamwork:
 - To implement effective teamwork strategies
 - To effectively plan and estimate project work
 - To identify the strengths, weaknesses, and styles of co-workers
 - To be proud of your team
- Results:
 - To create positive change in the world
 - To think big thoughts (i.e., to integrate and apply what you have learned in all of your other courses on a large team project)
 - To apply professional practices
 - To select and apply appropriate abstractions in communicating complex projects

The Capstone Design Project falls into one of the following categories (see SE Capstone Handbook, §2.2):

1. Contribute to an existing **Free/Open-Source Software**,
2. Collaborate with a professor to accomplishing publishable scientific **Research** results,

3. Develop, as a **Consultant**, some customer software for a specific external partner,
4. Develop a **New Product** for a clearly identified user group,
5. Create an **Advanced Technology** that combines knowledge from multiple technical elective courses and addresses an important and difficult problem (but does not necessarily have a business case component the way a new product does)

The criteria used to evaluate and grade your project at symposium time depend on the category and are specified in the SE Capstone Handbook, §14. **These grading rubrics are important to consider during project topic selection in se390.** For example, achieving grade A+ in the New Project categories requires “Thousands of light users *or* hundreds of heavy users *or* positive mention in mainstream/industry press *or* winning a reputable startup pitch competition” (see §14.2.1).

Note to students interested in grad school: Some of you may be considering grad school after graduation. A capstone project in the Research category, if successful, that is, if it results in a scientific publication, will give you an edge as an applicant. The collaborating professor would also be an ideal choice to write a reference letter. If creating a capstone team for a Research project turns out too difficult, you should consider doing an Undergraduate Research Assistantship (URA). I have seen many cases of students trying to get reference letters for grad school in their final term without any research experience. Course instructors (including myself) usually do not know about you enough to write a meaningful reference letter. You need to plan ahead to have letter writers who can talk about your research abilities, which can be professors working with you as advisors for a capstone project in Research category or as URA supervisors.

Course Objectives

The se390 course objectives are same as those listed for the Capstone project, with the focus on identifying a problem worth solving, establishing an effective project team and development practices, and accomplishing 15-20% of the project by the end of the term. To aid these goals, the course gives the students an opportunity to apply concepts and methods in strategic positioning, requirements engineering, software design, user-centric design, research literature study, project management, teamwork, and intellectual property management. It also gives an opportunity to try out more than one topic and project category, work as part of different teams to experience different team dynamics, and learn what a team can accomplish within a project iteration.

Course Structure

In order to accomplish the objectives, the course is structured into three iterations, allowing and encouraging switching topic and team compositions between the iterations. You don't have to switch if you feel strongly that you have the right project idea and an effective team. Consider that switching will likely give you more experience and opportunity to arrive at a strong project idea and team.

The iterations are referred to as Mini-Project 1,2,3 and each consecutive iteration is longer than the previous one. Mini-Project 1 is just three weeks long, and its short duration aids receiving

early feedback and getting the project and team structure into place quickly. Mini-Project 2 is four weeks long, and Mini-Project 3 is four-and-a-half weeks long. It is not necessary and also not very likely that the idea you select for Mini-Project 1 will be the same as what you will present on symposium day. Since Mini-Project 1 is just three weeks, pick a project idea that will allow you to learn about specific domain or technology you find interesting and also accomplish some meaningful results by the end of the iteration. The results can have different forms, including a software prototype, an evaluation of a user interface mock-up, or a literature review. The main objective of the iteration is to start working on a problem as a team and learn what you can accomplish within the three weeks. Throughout the iteration, your team should continue brainstorming and evaluating the capstone project ideas, which you will likely eventually start working on in Mini-Project 2 or 3.

Each iteration ends with a project review by the instructor. Most of the grade is awarded based on the project results and the professionalism and effectiveness of the team, with each consecutive iteration being worth a higher percentage of the final grade than the previous one.

Team Size and Composition

A standard team for the SE capstone has four members who are SE students in the same cohort. Under special circumstances, teams can also have more, that is, five or six members, or fewer, that is, three members.

- Two students is not considered a workable team.
- A team of three is likely the result of a team member leaving a team of four. While a project can continue with three members, starting with four rather than three members provides a safety margin.
- Teams can be formed also with students from other engineering programs working on their 4-th Year Design Projects; however, the diverging schedules may cause complications that should be identified and mitigated when forming such a mixed team. Students from other programs are normally expected to participate in the deliverable review meetings of their team with the instructor, but this is not mandatory given that they have a different schedule.
- An exchange student taking se390 should join an existing team of four SE students (i.e., not a team that would already have another exchange student) to form a team of five in anticipation of the team continuing with the four SE students in the future.
- SE students who are on exchange and wish to take this course will likely have to rely on Piazza to find a team. They are expected to coordinate with the rest of their team regarding meeting schedule and remote interaction to contribute to the team project. Their contributions will be judged similarly to the contributions by students on campus.
- Students who plan to go for a double coop, i.e., a back-to-back coop terms in Winter and Spring, should consider forming a 3+3 team, with three members going on a double coop and the other three students going on a single coop in Winter. That way the project can continue with at least three members in se490 in Spring and Fall.

The shifts from Mini-Project 1 to 2 and 2 to 3 provide an opportunity to change the team composition. Some members may decide to switch teams, and some teams may disband.

Textbook

The official textbook for this course is “SE Capstone Design Project Handbook” by Prof. Derek Rayside (available from the course website, see below). The main body of the textbook contains material on concepts, methods, and past experience that you will work through and apply to your project, as outlined in the course schedule below.

Online course resources:

The course uses

1. Course website for the handbook and past project abstracts and videos
https://ece.uwaterloo.ca/~se_capstone/;
2. Piazza for daily communication;
3. Gitlab repo for team abstracts, presentation slides, and peer reviews (use your UW credentials): <https://git.uwaterloo.ca/secapstone/se2025-390>
NOTE: Everyone in the class has a Developer status in this repo. This will maximize sharing of ideas and collaboration, which is intended. It also means that you need to take care not to inadvertently delete someone else’s work. Further, you are not allowed to share information about another team’s project outside of this class.
4. LEARN to post recordings of guest speaker sessions and this course outline.

Contacting the instructor:

Use Piazza. If the topic is relevant to your peers, make a general posting. Otherwise use a private message.

You’ll find it here: <https://piazza.com/uwaterloo.ca/fall2023/se390>

Interaction with the Instructor, team work, and additional guest sessions and recordings

The focus of the course is on your team work and the individual interaction between your team and the instructor for guidance, feedback, and evaluation, rather than meetings in class setting. Thus, most of the time you invest in this course will be the project teamwork.

The first two lecture slots will be in-person and will offer an opportunity to network to form teams and ask the instructor questions in person. The lecture slot is scheduled on Thursdays, 12:30 pm – 6:20 pm, in MC 4020.

There are four mandatory online meetings between each team and the instructor: Mini-Project 1, 2, and 3 reviews, and one status “check-in” meeting in the middle of Mini-Project 1; optional “check-in” meetings in the middle of Mini-Projects 2 and 3 and additional meetings can be requested with the instructor as needed.

Additionally, we will have selected guest speakers, who will present in some of the lecture slots. The guest speakers will include SE capstone alumni and other invited experts, on topics such as

identifying important problems, effective teamwork, and intellectual property management. The sessions and their modality (in-person or synchronous online) will be announced on Piazza, and you are encouraged to participate in them, so that you can ask questions to the guest speakers. The sessions will also be recorded for offline viewing.

Each student will review several other Mini-Projects 2, which will give generate useful peer feedback (graded) and insight what other teams are working on.

Finally, some of the course concepts will be delivered as video recordings for offline viewing via Learn and YouTube and reading. This includes assigned viewing of video recordings from past SE Symposia and other events, and assigned reading of selected handbook chapters, as they become relevant to the project.

Schedule

The following table gives an approximate distribution of the work activities over the course of the term. Note that dates of guest lectures may need to move until confirmed with the guest speakers.

As you start working on Mini-Project 1, you should read handbook sections that will be relevant to your project activities, and in particular the sections on Prototyping (see Handbook §5.4), Requirements (§7), Design (§8), User-Centered Design (§10 and §11), and Literature Review (§6.8), and plan to finish the reading in week 3.

Plan your effort for each week based on the schedule given in the table. Keep a time log of your project activities and compare it with the your plan (learning to keep a time log is an important productivity skill, see §5.3). Be prepared to summarize the use of your time during check-ins with the instructor and project reviews.

In this schedule, each week starts on Thu and ends on Wed.

Week	Activities for the week	Instructions	Deliverables (see the next table for deadlines and details)
w1 (Sep 7)	Setup Mini-Project 1 team and topic	<ol style="list-style-type: none"> 1. Establish project team (see §2.4); use the in-person class to network; to find additional members after the class, post on Piazza 2. Establish regular team meetings (e.g., semi-weekly scrum + ad hoc meetings), a communication platform 	<ol style="list-style-type: none"> 1. Mini-Project 1 abstract in team subdir on in the course gitlab according to instructions 2. Be prepared to discuss with the instructor your established meeting schedule, the

		<p>(e.g., MS Teams, slack), and a project repository (e.g., github or gitlab)</p> <ol style="list-style-type: none"> 3. Watch the SE alumni panel with their advice of how to run a successful capstone project (on LEARN) 4. Brainstorm project topics (see §2, §2.1 - §2.5, §4, §6.3-4, §6.6 for brainstorming advice); try at least two brainstorming techniques from §4 (e.g., Crazy 8s; think / pair /share; and six thinking hats) 5. Add Mini-Project 1 team subdir and abstract to course gitlab 	<p>brainstorming techniques you've applied, and the key insights from the SE alumni panel</p>
w2 (Sep 14)	<p>Work on Mini-Project 1;</p> <p>Course concepts: success criteria, risk management, and related-work research;</p>	<ol style="list-style-type: none"> 1. Continue working on Mini-Project 1 2. Explore abstracts of past projects and watch past symposium videos (see course website); 3. Watch the guest lecture by Prof. Larry Smith with advice on how to select an impactful project idea (on LERAN) 4. Establish project success metrics for your project (see §5.2) 5. Brainstorm project risks and plan mitigation strategies (see §6.5) 6. Sign-up for the check-in meeting with the instructor 	<ol style="list-style-type: none"> 1. Be prepared to discuss the past symposium videos you watched and how your idea relates to any similar past capstone projects, but also related work or competitors in the field; 2. Be prepared to discuss your success metrics and the main risks for your project and how you plan to mitigate them
w3 (Sep 21)	<p>Work on Mini-Project 1;</p>	<ol style="list-style-type: none"> 1. Continue working on Mini-Project 1 2. Read about Prototyping (see §5.4), Requirements 	<ol style="list-style-type: none"> 1. Check-in meeting with the instructor (start of this week)

	<p>Course concepts: requirements, prototyping, and literature review;</p> <p>Mini-Project 1 presentation slides preparation;</p>	<p>(§7), Design (§8), User-Centered Design (§10 and §11), and Literature Review (§6.8) activities</p> <ol style="list-style-type: none"> Plan Prototyping, Requirements, Design, User-Centered Design, and Literature Review activities according to your project needs (see table in §2.3) Prepare Mini-Project 1 presentation (see §13.1-7) Sign-up for the presentation 	<ol style="list-style-type: none"> Be prepared to discuss your Prototyping, Requirements, Design, User-Centered Design, and Literature Review plan according to your project needs Be prepared to discuss how your experience so far relates to any of the advice from the alumni panel Mini-Project 1 presentation in course gitlab due end of this week
w4 (Sep 28)	<p>Present Mini-Project 1;</p> <p>Start Mini-Project 2;</p>	<ol style="list-style-type: none"> Mini-Project 1 presentation to the instructor (and optional video recording) Set-up Mini-Project 2 topic and team; this can be continuation of Mini-Project 1 topic or a new topic or team or both (pivoting – see §2.6 and §2.7); prepare a revised or new abstract (see §13.9) Start working on Mini-Project 2 	<ol style="list-style-type: none"> Present Mini-Project 1 results to the instructor (start of the week) Set up Mini-Project 2 team subdirectory with revised abstract in course gitlab
w5 (Oct 5)	<p>Work on Mini-Project 2;</p> <p>Course concepts: teamwork;</p>	<ol style="list-style-type: none"> Continue working on Mini-Project 2 Watch teamwork presentations on LEARN and prepare a team contract for your team (also see §3 for teamwork strategies) 	<ol style="list-style-type: none"> Put your team contract into your Mini-Project 2 team subdirectory in course gitlab
w6	Reading week	No assigned activities	

(Oct 7-15)			
w7 (Oct 19)	Work on Mini-Project 2; Course concepts: strategic positioning; (Midterm week)	<ol style="list-style-type: none"> 1. Continue working on Mini-Project 2 2. Reevaluate strategic positioning of your project moving forward (see §6.4) 	<ol style="list-style-type: none"> 1. Be prepared to discuss the strategic positioning of your project and how the guest lecture by Prof. Larry Smith might have impacted your thinking about project ideas
w8 (Oct 26)	Work on Mini-Project 2; Mini-project 2 presentation slides preparation;	<ol style="list-style-type: none"> 1. Continue working on Mini-Project 2 2. Prepare Mini-Project 2 presentation slides and recording, upload the recording as a private video to YouTube and practice the presentation for delivery 	<ol style="list-style-type: none"> 1. Mini-project 2 presentation slides and presentation recording due by the end of this week
w9 (Nov 2)	Present Mini-Project 2; Start Mini-Project 3; Provide feedback on Mini-Project 2 to peers;	<ol style="list-style-type: none"> 1. Mini-Project 2 presentation to the instructor 2. Set-up Mini-Project 3 topic and team; this can be continuation of Mini-Project 2 topic or a new topic or team or both (pivoting – see §2.6 and §2.7); prepare a revised or new abstract (see §13.9) 3. Start working on Mini-Project 3 4. Provide feedback on Mini-Project 2 to selected teams based on their slides and presentation recording 	<ol style="list-style-type: none"> 1. Present Mini-Project 2 results to the instructor 2. Sign-up for teams to critique 3. Set up Mini-Project 3 team subdirectory with revised abstract in course gitlab 4. Put your written feedback to selected teams into their Mini-Project 2 team subdirs
w10 (Nov 9)	Work on Mini-Project 3; Course concepts:	<ol style="list-style-type: none"> 1. Continue working on Mini-project 3 2. Read about Intellectual Property (IP) management (see §15) 	<ol style="list-style-type: none"> 1. Be prepared to discuss the main concept from the IP lecture and how they might apply to your

	intellectual property (IP);	3. Participate in or watch guest lecture on IP 4. Sign-up for check-in meeting with the instructor (optional)	situation during Mini-Project 3 review
w11 (Nov 16)	Work on Mini-Project 3; Check-in with the instructor (optional);	Continue working on Mini-Project 3	Check-in with the instructor on progress (optional)
w13 (Nov 23)	Work on Mini-Project 3; Mini-Project 3 presentation slides preparation;	1. Continue working on Mini-Project 3 2. Prepare Mini-Project 3 presentation slides (and video)	Mini-Project 3 presentation slides due the day before final review
w14 (Nov 30)	Present Mini-Project 3;	1. Mini-Project 3 presentation to the instructor	Present Mini-Project 3 results to the instructor

Deliverables

There is only one individual deliverable (peer critique); the remaining deliverables are prepared by teams. Additionally, each individual team member is responsible for being familiar with the assigned reading and guest lectures.

During each of the four meetings with the instructor, be prepared to show

2. your code repository,
3. log of your commit activity,
4. samples of development artifacts (e.g., user stories, mock-ups, issue tracker, code),
5. list of your team meetings, and
6. demo implemented functionality.

For the MP1 and MP3 review meetings with the instructor, you are **highly encouraged to record a 5-min video** of your presentation to streamline the meeting. **The 5-min presentation video is mandatory for MP2 to facilitate peer critiques.**

Deliverable	Description	Due date
Mini-Project 1 abstract	Create abstract.md file that includes a title, project category (one of the five), name and	Due by the end of September 15

	UW id of each team member, and the abstract (see advice on LEARN under “Project blast-off and abstract writing” and §13.9). Put the file into your Mini-Project 1 team subdirectory (see Submission logistics for details).	
Check-in with the instructor	A ten-minute meeting with the instructor to discuss the abstract, and your effort and progress so far.	The check-in meetings will take place throughout the day on September 21 on MS Teams. A sign-up sheet will be provided.
Mini-Project 1 results, slides, and presentation	Prepare a five-minute presentation of your Mini-Project 1 results (see §13.1-7). Assume that the audience is familiar with the abstract. Focus on what you were able to accomplish in the three weeks, lessons learned, and how you plan to improve in the next iteration and the applicable Prototyping, Requirements, Design, User-Centered Design, and Literature Review activities according to your project needs (see table in §2.3). Be prepared to discuss success criteria and risk management for your project.	Slides are due in course gitlab by the end of September 27. Providing a YouTube link to a 5-min video recording of the presentation in the sign-up sheet is encouraged. Presentations will run on September 28 on MS Teams. A sign-up sheet will be provided.
Mini-Project 2 abstract	Create updated or new abstract.md file and put it into your Mini-Project 2 team subdirectory (see below for details).	Due by the end of October 6
Team Contract	Based on the teamwork material posted on LEARN under “Teamwork” and §3.2 in the handbook, prepare a team contract for your team and submit to course gitlab (see Submission logistics for details).	Due by the end of October 6 Team contract template will be provided in LEARN.
Mini-Project 2 results, slides, video, and presentation meeting	Prepare a five-minute presentation of your Mini-Project 2 results. If Mini-Project 2 is a continuation of Mini-Project 1, assume that the audience is familiar with the abstract. Focus on what you were able to accomplish in the four weeks, comparison to competition, lessons learned, and how you plan to improve in the next iteration. Meet with the instructor to present and discuss your results (the meeting duration is ten minutes). Be prepared to discuss your team contract and the project strategic	Slides in course gitlab and the YouTube video link in the sign-up sheet are due by the end of November 1. Presentations will run on November 2 on MS Teams. A sign-up sheet will be provided.

	<p>positioning during the meeting with the instructor.</p> <p>Prepare a five-minute video with your slides and narration for on-demand viewing. Provide a link at which the video can be viewed (as a private video on YouTube) and include it in your abstract.</p>	
Peer reviews (individual)	<p>Read the abstract and watch the presentation video of five selected teams and provide written constructive feedback (approximately between half and one page). The feedback should provide a short summary of the project (two-three sentences), a list of strengths and weaknesses wrt. strategic positioning, proposed technical solution, and development approach, and suggestions for improvements. Submit the reviews to course gitlab (see below for details)</p>	<p>Sign up for five teams on November 3. A sign-up sheet will be provided.</p> <p>The reviews are due by the end of November 9.</p>
Mini-Project 3 abstract	<p>Create updated or new abstract.md file and put it into your Mini-Project 3 team subdirectory (see below for details).</p>	<p>The abstract is due by the end of November 6.</p>
Check-in with the instructor (optional)	<p>A ten-minute meeting with the instructor to discuss your effort and progress so far. Be prepared to also discuss the peer feedback you have received.</p>	<p>The check-in meetings will take place on November 16 on MS Teams. A sign-up sheet will be provided.</p>
Mini-Project 3 results, slides, and presentation meeting	<p>Prepare a five-minute presentation of your Mini-Project 3 results. If Mini-Project 3 is a continuation of Mini-Project 2. Focus on what you were able to accomplish in the five weeks, how well you have worked as a team, lessons learned, and how you plan to improve in the next iteration.</p> <p>Meet with the instructor to present and discuss your results (the meeting duration is ten minutes). Be prepared to discuss how the Intellectual Property concepts from the guest lecture might apply to your project.</p>	<p>Slides in course gitlab are due by the end of December 3. Providing a YouTube link to a video recording of the 5-min presentation in the sign-up sheet is encouraged.</p> <p>Meetings with the instructor will run on December 4 on MS Teams.</p> <p>A sign-up sheet will be provided.</p>

Submission logistics

You will put all deliverables (except your project code) into the SE capstone repo for this class as described below:

<https://git.uwaterloo.ca/secapstone/se2025-390/>

When submitting deliverables, please create a merge request for the main branch, which I will review and merge. Make sure to always commit your work to the respective team's directory. I reserve the right to subtract points for corrupting the course repository. Please create a single merge request per deliverable and give it a description that starts with the team name, so I can search for it.

Abstract

Once you establish a team and start working on a mini-project, create a team subdirectory in the corresponding mini-project directory in course gitlab and put abstract.md into it. Please use a short team name and ensure that you spell it same way in the subdir name, when signing-up for review meetings with the instructor, and in the pull-request description.

For example, team "leafs" working on Mini-Project 1 would create the following directory:

<https://git.uwaterloo.ca/secapstone/se2025-390/mini-project1/leafs>

I reserve the right to subtract points for not following these instructions.

Presentations

Your team will have five minutes to present each of your mini-projects to the instructor. This is not much time. It will take some work for you to figure out what is important to say in such a limited time. To be on a safe side, it has worked best to have a private YouTube video recording of your presentation for the instructor to view.

Please put the presentation in your team subdirectory in the corresponding mini-project directory in course gitlab (i.e., next to the abstract).

There will be a sign-up sheet provided before the presentation day(s). **Make sure to follow the sign-up instructions given in the sheet, or penalty points may be subtracted.** For example, there I give precise instructions how to sign up each student with the eight-character UW ID, one per line. I rely on this format to transfer marks.

Presentation video(s)

You will create a five-minute video that presents your Mini-Project 2 (MP2) slides with recorded audio, so that it can be used by your peers to provide feedback. As already said, you are encouraged to create a video for your 5-min presentation of MP1 and MP3 and use the video during the review meetings with the instructor to streamline the meeting. The videos should be posted to YouTube and the links provided in the sign-up sheets. This way the instructor can play

it at the beginning of the meeting and then follow up with questions. Also put the link to the video(s) into the mini-project abstract(s).

You can use Open Broadcasting Studio (<https://obsproject.com>) or any other software of your choice to create the video. You will need to provide a link to the video for on-demand viewing. The desired option is to upload it as a private video to YouTube, other publishing options often resulted in technical difficulties during the review meetings in the past.

Team Contract

Put the filled-out team contract form into your Mini-Project 2 team subdirectory.

Peer review

Put each of the reviews into the respective Mini-Project 2 team's subdirectory under reviews and name the file using your UW id:

https://git.uwaterloo.ca/secapstone/se2025-390/mini-project2/REVIEWED_TEAMNAME/reviews/YOUR_UW_ID.md

Grading policy

Marking scheme

- Mini-Project 1 (Team)
 - Process – 2%
 - Results – 2%
 - Presentation – 1%
- Mini-Project 2 (Team)
 - Process – 10%
 - Results – 15%
 - Presentation – 5%
 - Video – 5%
- Mini-Project 3 (Team)
 - Process – 15%
 - Results – 30%
 - Presentation – 5%
- Peer critique (Individual) – 10%

The schema may be extended with additional bonus points for participation in in-person/synchronous guest lectures.

Grading details

For most components, the components in the grading scheme are evaluated holistically. There are many factors influencing the evaluation (as listed below), and the mapping also has to take into account the significant differences among the capstone projects, in their technical challenges, level of difficulty, domains, and objectives.

The mapping between factors (e.g., functionality, specification, productivity, quality, plan, etc.) and the grade is evaluated holistically. In other words, there is no a priori marking scheme breakdown for these components and factors. Capstone design projects differ significantly in their technical challenges, level of difficulty, domains, and objectives. Holistic evaluation considers all factors, and allows flexibility to reward focused excellence, new ideas, new approaches, effective development practices, and well-working and effective teams.

The mark includes 10% individual (per student) portion:

- 1) **Peer critiques:** You will critique the project of five other teams. As you work on your own project, this activity give you an opportunity to reflect on the projects of your peers and provide them with constructive critique; on the other hand, you will receive independent constructive critique from multiple peers, which can be invaluable. Take this activity seriously; it is a give and take and part of professional practice. Be respectful in your review, but also clear and direct. You want to acknowledge what is good, but also—and most importantly—point out potential weaknesses and risks, and suggest improvements and pointers to resources that may be of interest to the team. The peer critiques will be evaluated holistically with respect to their depth, quality, and comprehensiveness.

The remaining portion of the grade (90%) is per mini-project and per team, and has the following components, each assessed holistically:

- 1) **Process:** effort, effective use of time, knowledge and application of the concepts covered in the course, effective project management and development practices, professionalism (e.g., submitting deliverables on time, attention to detail and quality). Also team contract for MP2.
- 2) **Results:** artifacts produced (tangible or conceptual, e.g., code, requirements, plans, design, literature survey, etc.), significance to the project objectives, quality of the outcomes, ambition, and volume / quantity of the results.
- 3) **Presentation:** effective use of presentation time, clarity, flow, effective use of visual elements (see §13.1-7).
- 4) **Video:** Relevant criteria similar to presentation; but also narration flow and audio quality.

When grading, I will use letter grades with the following conversion:

A+ 100
A 90
A- 85

B+ 80

B 75

B- 70

C 65

(It is also possible to get less than 65.)

A separate document on LEARN sets the expectations on the performance and achievements of the teams during the term.

I reserve the right to adjust the grade of an individual team member for their team deliverables if this member grossly underperforms compared to the rest of the team.

A+ will be awarded for exceptional achievements, and thus it is expected to be rare.

Course Policies

Collaboration & Plagiarism: Plagiarism, taking credit for work that others did, is not permitted, and this applies to source code and other submitted documents. Any cases of plagiarism I detect will be reported, according to university policy (see the University Policy section below).

You may discuss ideas and design alternatives; however, each team must submit their own, independently developed deliverables. You are encouraged to use third-party libraries or even build on your own previous code, but you can take credit only for the code newly developed in this course. You also need to properly cite any external sources you use in preparing your deliverables.

I want to emphasize that I take the issue of plagiarism very seriously, and so does the University of Waterloo. If you are uncertain about this subject, please seek some guidance. There are many resources available to you. You can check the university policies, and talk to the course instructor if in doubt.

Late Submissions: Late deliverable submissions will not be accepted.

Extra Credit: In this class, there will be no opportunities to earn extra credit. Make-up projects will not be offered under any circumstances.

Attendance & Illness: Attendance of the scheduled team meetings with the instructors and presentations is mandatory for all team members. Attendance of the guest lectures is not mandatory, but highly encouraged and appreciated. It would be simply unfair to the guest speakers to have low attendance.

If you feel ill, you should seek appropriate medical attention. If you miss a team meeting with the instructor for health reasons, you need notify me, explaining the reason.

University Policies

Academic Integrity In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. Check www.uwaterloo.ca/academicintegrity/ for more information.

Grievance A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4, adm.uwaterloo.ca/infosec/Policies/policy70. If in doubt, contact the department's administrative assistant, who will provide further assistance.

Discipline A student is expected to know what constitutes academic integrity (see above section) to avoid committing an academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline, www.adm.uwaterloo.ca/infosec/Policies/policy71. For typical penalties check Guidelines for the Assessment of Penalties, see www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.

Appeals A decision made or penalty imposed under Policy 70 (Student Petitions and Grievances) (other than a petition) or Policy 71 (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) www.adm.uwaterloo.ca/infosec/Policies/policy72.

Privacy Questions about the collection, use, and disclosure of personal information by the University, should be directed to the Freedom of Information and Privacy Coordinator, Secretariat, University of Waterloo, 200 University Avenue West, Waterloo, Ontario, Canada N2L 3G1. The email address of the Freedom of Information and Privacy Coordinator is fippa@uwaterloo.ca. See also University of Waterloo Policy 19: Access to and Release of Student Information; Information and Privacy. <https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-19>

Note for Students with Special Needs The AccessAbility Services (formerly known as OPD) located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the AccessAbility Services office at the beginning of each academic term.