

CSCI 4961/4962: Capstone Project

Instructor

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 or by appointment

Overview

The Capstone Project serves as a concluding achievement for graduating students, allowing them to apply knowledge that they have gained from the Computer Science curriculum toward a year-long project. Formally, the project is completed as part of a two-semester sequence of 2-credit courses: CSCI 4961 (Capstone Project I) and CSCI 4962 (Capstone Project II).

Student Learning Outcomes

After successfully completing this course sequence, students will be able to:

1. Communicate with a client regarding project requirements and formally document the requirement specifications.
2. Develop a project design and plan, including reasonable timeline and effort estimates.
3. Design, implement and test a medium- to large-scale software product which meets given requirements specifications.
4. Use a range of tools in support of the development of a team-based software product.
5. Effectively communicate with peers and supervisors in a technical setting.

Roles

Key roles in the capstone course are as follows:

- **Student Team**

Each project is to be completed by a team of students; in rare situations, that team may consist of a single student.

- **Client**

For most projects there will be a clearly identified “Client” who originally proposed the project or is a potential end user of the result; the client may or may not be a CS faculty member. The client typically serves as a primary point-of-contact in shaping the desired specification for the eventual product and may provide feedback on early prototypes.

- **Supervisor**

Each project will have a “Supervisor” who is a CS faculty member that oversees the team’s progress on the project. The Supervisor may or may not be the instructor-of-record for the course, and may be the same person as the Client, in cases where the Client is already a CS faculty member.

- **Instructor**

The instructor-of-record for the course is responsible for the administration of the course, assignment of teams, scheduling of presentations, and record-keeping involving grades.

The Supervisor and the Instructor will work together in grading the performance of the teams. A non-CS Client may be consulted, but has no formal responsibilities in regard to evaluation.

Project Selection

At the onset of CSCI 4961, the instructor will circulate a list of potential projects to consider. These projects are often suggested by CS faculty members based on research endeavors or educational tools, are based on requests coming from members of the broader SLU community, or in some cases from external community groups. Students will also be afforded an opportunity to suggest project ideas for consideration. Projects should have an appropriate scope for a year-long sequence, having a richness in both aspects of design and use of technology. Past examples of project descriptions will be provided.

At the beginning of the second week, individual students will be asked to submit a ranked list of preferences for projects of interest, and preferences regarding the composition of student teams. The supervisors will make final determination of the teams and their assignments to projects, while taking into consideration the preferences submitted by students. Those assignments will be announced by the end of the second week.

During the third week, each student team must develop a formal Project Plan that outlines the scope of the project, and the timeline for major deliverables for both Capstone I and Capstone II. This plan must be approved and signed by both the Supervisor and Instructor no later than Friday, September 15 to be considered prompt.

Project Timeline, Deliverables, Presentations

Each project is unique, and teams may adopt one of a variety of project management styles. However, all teams must adhere to the following checkpoints and timeline (details of which follow).

Required Work	Deadline
Individual preferences	5:00pm Tuesday, September 4
Formal Project Plan	Friday, September 15
Weekly reports	each Friday
CSCI 4961: Deliverable #1 CSCI 4962: Deliverable #3	Friday, October 13
Midterm presentation	TBD, week of October 16–20
Final presentation	Tuesday, December 12
CSCI 4961: Deliverable #2 CSCI 4962: Deliverable #4	Friday, December 15
Team self-assessment	Friday, December 15

- **Deliverables**

Given the wide range of projects, there is no one-size-fits-all definition for the deliverables, but as part of the initial project plan, the students and Supervisor should outline four major stages of the project that are to be achieved by the four checkpoints in our timeline (middle of first semester, end of first semester, middle of second semester, end of second semester).

For teams following a traditional waterfall model, likely checkpoints are as follows:

- Deliverable #1: Requirements Specification
A written document that clearly define the goals of the final product in terms of functionality, user interface, resource usage, and other such factors. This document should include a project overview, any necessary background knowledge, and an enumeration of formal requirements specification for the eventual product (e.g., “Requirement 7b”).
- Deliverable #2: Design Document
A written document that describes a detailed design for achieving the formal requirements. A design document should include a description of the major components, their interfaces and how they interact to form the whole. Figures should be included for clarity, such as a UML diagram of the software

design or an ER-diagram for a database. This document should also contain a discussion of any third-party technologies or software packages that will be used in meeting the project goals. Teams should demonstrate that they have already evaluated and familiarized themselves with any such technologies. Finally, this document must include a proposed time-line for the remainder of the project life cycle, making sure to include specific sub-goals for the development, implementation, and testing phases of the project.

– Deliverable #3: Alpha Version

The alpha version of the project is a preliminary implementation that includes all *major* functionality of the final product, yet may lack some advanced features, have a less polished interface, and contain some known bugs.

– Deliverable #4: Final Product

The final product must be submitted, including complete source code, documentation for deployment and usage, database schemas, analysis, and so on, as appropriate for the project.

For teams following an agile development process, the deliverables are more naturally going to be a series of working products with increasing refinement. For teams exploring research-driven questions, the deliverables might be papers that describe the work and results.

- **Presentations**

The teams will make four presentations during the two-semester sequence, typically just after a recent deliverable was submitted. Each presentation will be scheduled with 20 minutes for a formal presentation, followed by up to 10 minutes of questions from faculty members in the audience. Teams should prepare **polished presentation materials** and for most projects include a **live demonstration** of the current state of a product. Teams should test the presentation and demonstrations in the Linux classroom well in advance of the scheduled presentation.

- **Weekly Reports**

Each team is responsible for presenting a brief progress report during class on most Fridays. For Capstone I students, the first report will be on the third week of the semester; Capstone II teams will make their first report on the second Friday of the semester.

Each weekly presentation should detail what was accomplished during the week *by each team member*, what challenges were encountered, and a plan for activities in the upcoming week. *Each team member must speak for herself or himself.*

Please inform the instructor in advance if you need to miss the class meeting; up to two absences can be replaced with emailed weekly reports, but any absences beyond the first two will result in a grade penalty.

- **Team Self-Assessment**

For teams comprised of two or more students, each individual must complete and submit a *Team Self-Assessment Form*, detailing his or her perception of the contributions of each team member. This assessment is due to the instructor by the Friday after the final presentations each semester.

Repository for Project Artifacts

All teams will be required to use git repositories on hopper for all project artifacts (e.g., all deliverables, source codes, presentation materials). Both the instructor and supervisor should be granted access to the repository from the beginning of the project. An analysis of contributions to the repository may be used as additional evidence of individuals' participation.

Grading

Each semester of the capstone project is graded based upon the performance during that semester. The evaluation of students' artifacts and presentations will be made by a combination of the Instructor and project Supervisor. The overall grade will be weighted as follows:

- 10% Weekly Reports (including Project Plan for Capstone I)
- 20% Deliverable #1 (CSCI 4961) or Deliverable #3 (CSCI 4962)
- 15% Midterm Presentation
- 40% Deliverable #2 (CSCI 4961) or Deliverable #4 (CSCI 4962)
- 15% Final Presentation

Letter grades will then be assigned based on the following formula.

Student percentage above 90% will result in a grade of A or better.

Student percentage above 87% will result in a grade of A- or better.

Student percentage above 83% will result in a grade of B+ or better.

Student percentage above 80% will result in a grade of B or better.

Student percentage above 77% will result in a grade of B- or better.

Student percentage above 73% will result in a grade of C+ or better.

Student percentage above 70% will result in a grade of C or better.

Student percentage above 67% will result in a grade of C- or better.

Student percentage above 60% will result in a grade of D or better.

Student percentage below 60% will result in a grade of F.

Although team members will typically receive similar grades, in some cases the Instructor and Supervisor may consider the relative contribution of individual team members in assigning individual grades.

Academic Integrity

Academic integrity is honest, truthful and responsible conduct in all academic endeavors. The mission of Saint Louis University is “the pursuit of truth for the greater glory of God and for the service of humanity.” Accordingly, all acts of falsehood demean and compromise the corporate endeavors of teaching, research, health care, and community service via which SLU embodies its mission. The University strives to prepare students for lives of personal and professional integrity, and therefore regards all breaches of academic integrity as matters of serious concern. The governing University-level Academic Integrity Policy was adopted in Spring 2015, and can be accessed on the Provost’s Office website.

Additionally, each SLU College, School, and Center has adopted its own academic integrity policies, available on their respective websites. All SLU students are expected to know and abide by these policies, which detail definitions of violations, processes for reporting violations, sanctions, and appeals. Please direct questions about any facet of academic integrity to your faculty, the chair of the department of your academic program, or the Dean/Director of the College, School or Center in which your program is housed. Specific College of Arts and Sciences Academic Honesty Policies and Procedures may be found at:

<http://www.slu.edu/arts-and-sciences/student-resources/academic-honesty.php>

Title IX Statement

Saint Louis University and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If you have encountered any form of sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage you to report this to the University. If you speak with a faculty member about an incident of misconduct, that faculty member must notify SLU’s Title IX coordinator, Anna R. Kratky (DuBourg Hall, room 36; akratky@slu.edu; 314-977-3886) and share the basic fact of your experience with her. The Title IX coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off campus.

If you wish to speak with a confidential source, you may contact the counselors at the University Counseling Center at 314-977-TALK. To view SLU’s sexual misconduct policy and for resources, please visit the following web address: www.slu.edu/here4you.

Supporting Student Success

In recognition that people learn in a variety of ways and that learning is influenced by multiple factors (e.g., prior experience, study skills, learning disability), resources to support student success are available on campus. The Student Success Center, a one-stop shop, which assists students with academic and career related services, is located in the Busch Student Center (Suite 331) and the School of Nursing (Suite 114). Students can visit www.slu.edu/success to learn more about:

- Course-level support (e.g., faculty member, departmental resources, etc.) by asking your course instructor.
- University-level support (e.g., tutoring services, university writing services, disability services, academic coaching, career services, and/or facets of curriculum planning).

Disability Services

Students with a documented disability who wish to request academic accommodations **must** contact Disability Services to discuss accommodation requests and eligibility requirements. Once successfully registered, the student also **must** notify the course instructor that they wish to access accommodations in the course.

Please contact Disability Services, located within the Student Success Center, at Disability_services@slu.edu or 314-977-3484 to schedule an appointment. Confidentiality will be observed in all inquiries. Once approved, information about academic accommodations will be shared with course instructors via email from Disability Services and viewed within Banner via the instructor's course roster.

Note: Students who do not have a documented disability but who think they may have one are encouraged to contact Disability Services.