CSCI 491/496/497: Capstone Project

Preface

The Capstone Project serves a a concluding achievement for graduating students, allowing them to apply knowledge that they have gained with the Computer Science curriculum. We are currently at a time of transition in our management of the Capstone experience. Historically, the capstone has been a semester-long, 3-credit course designated as CSCI 491: Capstone Project. Degree requirements that became effective in Fall 2011 changes the requirement to be a new year-long, 4-credit sequence designated by the pair of courses CSCI 496: Capstone Project I, and CSCI 497: Capstone Project II. Our reason for the change was that we recognized that students face a very compressed time-line in moving from the initial selection of a project to its completion in a 15-week semester. In expanding to a full-year sequence, we hope that similar projects can be completed with greater care and success.

For students who enter SLU in Fall 2011 or later, the situation is clear; they are required to take the new year-long sequence. For students who entered SLU prior to Fall 2011, there is a choice. They have the right to take the single-semester CSCI 491, as stated in the official degree requirements from the time they entered SLU, or they may opt to take the new CSCI 496/497 sequence in lieu of CSCI 491. For the foreseeable future, we will support all versions of the course each semester.

Overview

The Capstone Project serves a a concluding achievement for graduating students, allowing them to apply knowledge that they have gained with the Computer Science curriculum. Each project is to be completed by an individual or a team of students; we henceforth use the terminology "team" even when referring to a team of one. There will be greater expectations for teams of two or more students.

Each project will have a faculty member (the "Supervisor") who will advise the team on the project; the Supervisor may or may not be the Instructor-of-record for the course. Each team must sign a contract, together with the Supervisor and Instructor, indicating what the project entails and requirements for successful completion. The Supervisor and the Instructor will be responsible for assigning grades for the course. Individual team members may receive distinct course grades based upon their contributions.

Instructor

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	Wednesdays 2:00–3:00pm
	Fridays 12:00–1:00pm
	or by appointment

Project Life Cycle

1. **Conception**
   The first phase is the selection of a project and the creation of teams. Topics for projects can be based on the interests of the team, chosen from ideas submitted by CS faculty, or coordinated with needs of other departments or units inside or outside the university. Students will be involved in the project selection and composition of teams, but the Instructor has final authority on both of these issues.

   Submitted Work
   > Contract

2. **Requirements Specification**
   Once the project selection is complete, the next phase should be the collection and formal specification of project requirements. If there is a natural "client" for this project, input from that client should be used in formulating these requirements. The goal is to clearly define the goals of the final product, in terms of functionality, user interface, resource usage, and other such factors. **These specifications must be organized and clearly enumerated (e.g. "Requirement 7b").**

   Submitted Work
   > Written document (CSCI 496 only; combined with phase 3 for CSCI 491)
   > Oral presentation (CSCI 496 only)

3. **Design**
   During the design phase, the team should develop a written document detailing how the team plans to meet the project requirements specified in the previous phase.

   For a traditional software project, 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.

Submitted Work
> Written document (for CSCI 491, this includes phase 2 as well)
> Oral presentation

4. **Implementation**

A preliminary ("alpha") version of the project must be submitted for review. This version must include all *major* functionality of the final product, yet it may lack some advanced features, have a less polished interface, and contain some known bugs.

Submitted Work
> Alpha version of software
> Oral presentation (CSCI 497 only)

5. **Testing, Debugging, and Refinement**

The initial prototype should be thoroughly tested to verify its consistency with the project requirements specification. Any identified deficiencies, or required features that were not included in the initial version, should be remedied for the final product.

Submitted Work
> none

6. **Final Production**

The project should be completed in accordance with the initial requirements specification, and with the remedy of deficiencies discovered during the testing phase.

Submitted Work
> Final product (including complete source code, documentation,
> > database schemas, analysis, etc.)
> Oral presentation

Weekly progress reports

Each team is responsible for submitting a brief progress report by the end of each Friday of the semester. During the initial period, when a project has not yet been chosen, the report should be sent to Dr. Goldwasser. Once a contract is in place for a project, all subsequent weekly reports should be sent to Dr. Goldwasser and the project Supervisor.

A report should indicate what was accomplished during the weekly by each team member, what problems were encountered, and the plan for activities in the upcoming week.

Weekly meetings

In consultation with the project Supervisor, weekly meetings should be schedule for the team.

Non-traditional projects

For capstone projects (e.g., research) that do not fit with a traditional development life cycle, the project Supervisor will recommend appropriate phases, artifacts, and checkpoints to substitute for the traditional model.

Grading and Deadlines

For all sections:

Letter grades will be based on an evaluation of each student's required work, in accordance with the weights given below, 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.

For CSCI 491:

Required Work	Grade %	Deadline	Description
contract	–	Friday, September 7	Note: the contract will not be graded, other than to reflect the timeliness of its completion.
Weekly report	10%	each Friday	*see description above*; lowest two scores will be dropped
Design document	20%	Friday, October 12	For CSCI 491, a single document serves as an artifact for phases 2 and 3 outlined above. It should include a project overview, any necessary background knowledge, an enumeration of formal requirements specification, and the detailed project design and remaining time-line.
Midterm presentation	15%	Tuesday, October 16	A 20-minute oral presentation, encompassing similar scope as that of the written design document. The presentation will be followed by up to 10 minutes of questions from Faculty members.
Alpha version	10%	Friday, November 16	Complete source code and any other necessary files must be submitted to the Supervisor and Dr. Goldwasser, at least 48 hours prior to the midterm presentation.
Complete product	30%	Friday, December 7	Complete source code, documentation of use, and any other necessary files for testing the project must be submitted to the Supervisor and Dr. Goldwasser at least 48 hours prior to the final presentation.
Final presentation	15%	Tuesday, December 11	An oral presentation of the completed project, together with a demonstration of any software. Teams should also discuss their experiences and what they have learned about working on a large project.
Team assessment*	–	Tuesday, December 11	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.

For CSCI 496:

Required Work	Grade %	Deadline	Description
contract	—	Friday, September 14	Note: the contract will not be graded, other than to reflect the timeliness of its completion.
Weekly report	10%	each Friday	*see description above*
Requirements specification	20%	Friday, October 12	This serves as an artifact for phase 2 as outlined above. It should include a project overview, any necessary background knowledge, an enumeration of formal requirements specification.
Midterm presentation	20%	Tuesday, October 16	A 20-minute oral presentation, encompassing similar scope as that of the written requirements specification. The presentation will be followed by up to 10 minutes of questions from Faculty members.
Design document	30%	Friday, December 7	This serves as the final artifact for the semester. For the sake of completeness, is should include all of the information (possibly revised) from the first written report, together with all design details as outlined above for phase 3.
Final presentation	20%	Tuesday, December 11	A 20-minute oral presentation, encompassing similar scope as that of the written design document. The presentation will be followed by up to 10 minutes of questions from Faculty members.
Team Assessment*	—	Tuesday, December 11	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.

For CSCI 497:

Required Work	Grade %	Deadline	Description
Weekly report	10%	each Friday	*see description above*
Alpha version	20%	Friday, October 12	Complete source code and any other necessary files must be submitted to the Supervisor and Dr. Goldwasser.
Midterm presentation	10%	Tuesday, October 16	Presentation and demonstration of alpha version
Complete product	40%	Friday, December 7	Complete source code, documentation of use, and any other necessary files for testing the project must be submitted to the Supervisor and Dr. Goldwasser, at least 48 hours prior to the final presentation.
Final presentation	20%	Tuesday, December 11	An oral presentation of the completed project, together with a demonstration of any software. Teams should also discuss their experiences and what they have learned about working on a large project.
Team assessment*	–	Tuesday, December 11	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.

Academic Integrity

Students are expected to have read and abide by the University statement on Academic Integrity as stated in Saint Louis University's Undergraduate Catalog. A more detailed policy statement is given by The College of Arts & Science (`http://www.slu.edu/colleges/AS/academi` which apply to this course as well.

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. Students who think they might benefit from these resources can find out more about:

- Course-level support in the remainder of this section or by asking the instructor

- University-level support (e.g., tutoring/writing services, Disability Services) by visiting the Student Success Center (BSC 331) or by going to `www.slu.edu/success`.

Students who believe that, due to a disability, they could benefit from academic accommodations are encouraged to contact Disability Services at 314-977-3484 or visit the Student Success Center. Confidentiality will be observed in all inquiries.

Course instructors support student accommodation requests when an approved letter from Disability Services has been received and when students discuss these accommodations with the instructor after receipt of the approved letter.