CS 499 - Senior Project

Despair

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CS 499 - Senior Project
Assignments

1. Submit your proposal; obtain instructor approval.
2. Present and submit weekly project status updates.
   Submit a weekly status update even if there isn't class.
3. Submit your requirements specification as scheduled; obtain instructor approval.
4. Complete the project as proposed and as specified in your requirements.
5. Demonstrate your work.
6. Submit your summary, including your final status update, with other promised deliverables.

CS 499 - Senior Project Proposal

The project proposal shall have the following sections:

1. **Scripture**
   Provide the text and reference of a relevant (canonized) scripture.
2. **Abstract**
   Provide a brief summary of your project. A few sentences should suffice since you will provide details in section 4. Complete and include the following sentence: "The focus of this project is ..." Note that the focus must be a Computer Science topic **and** something not covered in our Computer Science curriculum. You will provide additional detail regarding your focus in section 8.
3. **Background**
   Provide information essential to understanding your project. This includes, but is not limited to, the following:
   - Definitions
   - Why this topic is of interest
   - Prior work by others
   - Prior work by you
4. **Description**
   Provide details of your project.
   - Provide a description of your project.
   - Provide a clear description of what constitutes success for your project (e.g., 90% accuracy).
   - Divide your project into tasks; describe each task and the method(s) you will employ for each task. The first task shall be "preliminary research and proposal preparation". The second task shall be "research". Since you are developing software, tasks shall include requirements specification< design, and quality (such as testing).
5. **Scope**
   Clearly define the boundary separating what is included in your project (as described in section 4) and what is not included.
6. **Tasks and Schedule**
   For each task discussed in section 4, list the start date, stop date, and estimated number of hours to completion. Your schedule shall include submitting the requirements specification as a milestone. Be sure to consider holidays and other events that may impact your schedule. Be realistic! Provide the total estimated number of hours to completion. You must have a minimum of 117 total hours. The total number of hours sets the maximum grade you can earn; it does not establish the grade you have earned. With a total of 117 hours, you will earn no more than a C (and it is highly probable you will retake the class). With a total of 137 hours, you will earn no more than a B. If you want to earn an A, you must have a minimum of 156 hours.
7. **Deliverables**
   Provide a checklist of items that will be submitted for grading purposes at the end of your project. Since you are developing software, deliverables shall include requirements specification, design documentation, and source code.
8. **Applicability**
   Explain how this project facilitates you integrating previously learned material. Explain (as necessary) how this project is exclusive of the Computer Science curriculum.
9. **Required Resources with Costs**
   List (and describe, as appropriate) resources needed to complete your project. This includes, but is not limited to, hardware and reference material. Clearly specify if you expect the university to supply any of those resources (e.g., lab computers). Specify the estimated cost for each resource.
10. **References**

Provide a bibliography of reference material.

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Status Update

The project status update shall, at a minimum, provide the following:

1. The status of each task specified in the proposal.
   - What is the current status? Not yet started? In progress? Completed? Deleted?
   - When was it started (compared to the original and modified estimates)?
   - When was it completed (compared to the original and modified estimates)?
   - How many hours have been expended on this task to date (compared to the original and modified estimates)?
2. Accomplishments (achieved during the last reporting period)
3. Problems (suffered during the last reporting period)
4. Changes in Scope, Schedule, and Cost
   - All changes in scope, software requirements, and success criteria must be approved by the instructor.
5. Confessional
   - Specify the increase in the total number of actual hours since the last status update
   - Specify the anticipated total number of hours for your project
   - State if you are behind schedule, on schedule, or ahead of schedule
   - If you are behind schedule, explain what you are going to do to get back on schedule
6. A relevant (canonized) scripture, text and reference

The status update shall be **visual, verbal, and written**. Use the format given below. Submit the status update electronically (use submit in the Linux computer lab).

Group work: Report the total group hours using the format below. ***In addition****, add a column for each group member and report the hours for each group member.*

Required Format

	Current Status	Start Date			Stop Date			Number of Hours		
		Proposed	Modified	Actual	Proposed	Modified	Actual	Proposed	Modified	Actual
task 1										
task 2										
task 3										
task 4										
total hours										

Accomplishments

Problems

Changes in Scope, Schedule, and Cost

Confessional

Scripture

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Requirements Specification

The IEEE standard is overkill for the CS 499 project requirements specification.

Use shall, will, and may in the requirements specification.

Format your requirements specification in four columns, as follows:

1. A unique identifier for the functional requirement
2. Functional requirement
3. Demonstration scenario(s) for that requirement
4. Success measure(s) for that requirement

Use a separate row for each requirement.

CS 499 - Senior Project
Summary

And an account of this stewardship will I require of them
  in the day of judgment.
Doctrine and Covenants 70:4

The project summary shall include, at a minimum, the following information:

- Final status update
- Summary of all scope changes (since proposal)
- List of deliverables (from proposal; note any changes)
- Summary of what was accomplished
- Discussion of how your work satisfies what you proposed
- Known bugs and recommended enhancements
- What you learned from doing the project
- List of books, if any, that the McKay library should purchase

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CS 499 - Senior Project
Frequently Asked Questions

Q What is required for the senior project?

A You are to demonstrate that you have learned how to learn.

The catalog states, "The topic shall be such that the student shall apply material covered by the curriculum to understand a new topic." In other words, the focus of your senior project must be a Computer Science topic that we do not cover in our curriculum. In addition, it should be something that allows you to "pull together" what you have learned throughout our program. You are to apply what you have learned to learning something new.

Q Is the senior project required to be a software project?

A Yes. While a significant portion of your senior project could be research, it must include a significant amount of software to demonstrate your understanding of your research.

Q How is the software product resulting from the senior project graded?

A Either you do what you proposed to do and satisfy the requirements that you specified according to the success criteria you provided or you don't.

Please note that instructor-approved modifications to the proposal, requirements, and success criteria are permitted.

Q Can I use software written by others?

A No, if the software written by others is the focus of your senior project. Yes, otherwise.

For example, assume that your senior project is to build an artificial neural network and to dynamically generate graphics that display the results (whatever they may be). If the focus of your project is the artificial neural network, you may use software written by others to help generate the graphics. On the other hand, if the focus is the graphics, you must write that software yourself.

Q How much time should I allow for the senior project?

A If you want an A, you should plan on at least twelve hours per week over thirteen weeks for a total of at least 156 hours. See the proposal for more details.

However, most students work more hours than required; 180-200 total hours is common. You can earn additional credits for extra hours by registering for CS 499S.

Q Can my senior project be something I'm doing at work?

A Yes, as long as your project at work satifies the requirements for CS 499 and will continue to do so throughout the duration of the project. I am not required to accept changes that your workplace may mandate.

Q Can I start before my CS 499 class starts?

A Yes. However, you are strongly encouraged to prepare a proposal and obtain the instructor's approval **before** doing any significant work. The instructor is not obligated to accept prior work simply because it is prior work. You must be registered for CS 499 in the semester in which you plan to **complete** your senior project.

Q What are some possibilities topics for my project?

A The following list is not comprehensive and is not in any specific order. *You may not use a topic if you have taken a class in that subject area.*

- grad school research area (BYU, USU, UI)
- computer graphics
- artificial intelligence / neural nets / machine learning
- computer / network security
- computer forensics
- bioinformatics
- genetic algorithms
- concurrent / parallel computing
- distributed operating systems / applications
- embedded computing
- real-time programming
- machine vision / image processing
- robot interface
- cooperative effort with the Computer Engineering senior project

Q Are there some topics I should avoid?

A Games.
Natural language.

A word of warning: artificial intelligence must display intelligence!

Homework Instructions

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mediocre ideas + brilliant spelling, grammar, formatting, etc. != brilliance
brilliant ideas + mediocre spelling, grammar, formatting, etc. != brilliance, either

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Formatting

- Use an appropriate format for the assignment. Acceptable formats for homework assignments are
    - OpenOffice (.odt, .ods, and .odp),
    - Microsoft Office (.doc, .docx, .xls, .xlsx, .ppt, and .pptx), and
    - rich text format (.rtf).
  A spreadsheet is *not* a word processor.
- Use one-inch margins. *I have a ruler and I'm not afraid to use it!*
- Single space your text (unless given explicit instruction to do otherwise).
- Use a 12-point proportional-spaced serif font such as Times New Roman.
- Conserve electrons! Save trees!
    - No cover page.
    - No table of contents.
    - No index.
    - Do not start a new section on a new page.
    - Do not start endnotes, works cited, or the bibliography on a new page.
- The required number of pages is exclusive of
    - spacing between paragraphs,
    - headings,
    - figures,
    - graphics,
    - tables,
    - charts,
    - endnotes,
    - works cited,
    - bibliography, and
    - anything like unto the above.
- Citations and Works Cited
    - References to works cited shall be a number (or a comma-separated list of numbers) in square brackets; do not use superscripts.
    - Include a URL for each work cited.
    - The list of works cited shall be in numerical order and shall be sorted in ascending alphabetical order, by author surname.
    - Citations are not limited to direct quotations.

Submitting - How and When

- All homework assignments shall be submitted electronically through the Linux lab. Use submit to submit your homework (unless instructed otherwise); do not use e-mail. Examples where whateverYouNamedIt is your file to be submitted and yourUserID is your user ID):
    - submit whateverYouNamedIt.xxx
  where xxx is the appropriate extension.
- It is your responsibility to submit homework correctly, including, but not limited to, the correct location, the correct format, and the correct file extension. I am not responsible for homework I do not receive.
- Assignments are due before midnight on the date specified in the schedule. However, I will accept

your work as on-time if I have received it *before* 8 AM the next school day. One second after that and the work is "everlastingly too late" ([Helaman 13:38](#)). Late homework shall not be accepted (unless accompanied with an Oops! card).

Grading

- Make sure your submitted homework satisfies all specified requirements.
- Some homework assignments are group assignments. The grades for these assignments are based on the product from the group, *not* on individual contributions *(see [1 Corinthians 12:26](#)).* I reserve the right to adjust grades for group members who do not contribute their fair share to the overall product. Take the opportunity to learn how to play well with others. The goal is to learn how to work with others toward a common objective.
- Submitted homework shall be of a professional quality. This includes correct spelling and grammar with clarity abounding. Assignments are also graded on length, formatting, completeness, and content.
- [Microsoft Word's spelling and grammar checker](#) provides little value. My grader uses WordPerfect to check spelling and grammar. Carefully proofread your work!

Watch Out!

- Eschew obfuscation!
- Don't use a big word where a diminutive one will suffice.
- Do not confuse technical writing and creative writing.
    - Technical writing is succinct.
    - Technical writing is unambiguous. Avoid synonyms. Leave no room for interpretation.
    - Use headings or keywords from the assignment to clearly indicate you are providing the required information.
    - Keep it plain.
    - Keep it simple.
    - Make it obvious.
- Use gender-neutral (non-sexist) language.
    - [Stereotypes and Biased Language](#)
    - [Appropriate Pronoun Usage](#)
- Know the difference!
    - accept and except
    - affect and effect
    - as not as being
    - causal and casual
    - customer and costumer
    - ensure and insure
    - internet and Internet
    - it's and its
    - manner and manor
    - morale and moral
    - principal and principle
    - role and roll
    - than and then
    - that and which
    - their and there
    - toward not towards
    - versus and verses
- Use complete sentences, everywhere.
- Do not use a plural pronoun with a singular antecendent.
- Represent numbers appropriately! Know when to spell them out and when to use digits.

Possessives require apostrophes; know where to put them.

- Use software (product) when you mean software (product) and software project when you mean software project.
- Life cycle is two words.

[Common Errors in English](#)

CS 499 - Senior Project
Syllabus

Directed individual or group research and study of a topic in Computer Science not covered by the curriculum. The topic shall be such that the student shall apply material covered by the curriculum to understand a new topic.

Upon successful completion of this course, the student is able to

1. Apply "learn how to learn" to understand a new topic
2. Integrate previously learned material and apply it into a new area of Computer Science

Prerequisite

- CS 364 (Software Engineering I)

Required Text(s)

- none

Grading

- 70%   Project (includes approved proposal and summary)
- 10%   Requirements specification, submitted as scheduled
- 10%   Status Updates
- 10%   Attendance

Disabilities
Gender-based Discrimination and Sexual Harassment
BYU-Idaho and Brother Twitchell Attendance Policies

Disabilities

Disabilities
BYU-Idaho is committed to providing a working and learning atmosphere which reasonably accommodates qualified persons with disabilities. If you have any disability that may impair your ability to complete this course successfully, please contact the Services for Students with Disabilties Office at 208-496-1158. Reasonable academic accommodations are reviewed for all students who have qualified documented disabilities. Services are coordinated with the student and instructor by this office. If you need assistance or feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established policy and procedures by contacting the Personnel Office at 208-496-1700.

Gender-based Discrimination and Sexual Harassment

Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds, including Federal loans and grants. Title IX also covers student-to-student sexual harassment. If you encounter unlawful sexual harassment or gender-based discrimination, please contact the Personnel Office at 496-1130.

Brother Twitchell's Attendance Policy

Class attendance is required and is part of the grade. The attendance portion of your grade is the ratio of the number of days you attend class and the number of days of class. The following adjust the attendance portion of your grade:

- Late is defined as arriving after the prayer is offered or leaving before class is scheduled to finish. A 50% penalty is applied for being late.
- Very late is defined as missing at least one-half the class. A 75% penalty is applied for being very late.

Additional penalties for habitual and chronic offenders (see [Matthew 13:12](#)):

- If you are absent for one-eighth of the classes, the penalty for additional absences is doubled.
- If you are absent for one-fourth of the classes, the penalty for additional absences is quadrupled.
- If you are late for one-eighth of the classes, the penalty for being late to additional classes is doubled.
- If you are late for one-fourth of the classes, the penalty for being late to additional classes is quadrupled.
- If you are very late for one-eighth of the classes, the penalty for being very late to additional classes is doubled.
- If you are very late for one-fourth of the classes, the penalty for being very late to additional classes is quadrupled.