

CS 499, et al. - Senior Project

[Assignments](#)

[Proposal](#)

[Status Update](#)

[Requirements Specification](#)

[Summary](#)

[Frequently Asked Questions](#)

[Homework Instructions](#)

[Syllabus](#)

[Policies](#)

Despair

- [Ambition](#)
- [Challenges](#)
- [Distinction](#)
- [Hope](#)
- [Legacy](#)
- [Obstacles](#)
- [Perseverance](#)
- [Sacrifice](#)

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CS 499, et al. - Senior Project

Assignments

1. Determine the focus of your project; obtain instructor approval.
 2. Submit your proposal; obtain instructor approval.
 3. Present and submit weekly project status updates. The status update is due the day before class. For example, if class is held on Thursday, the status update is due on Wednesday. *Submit a weekly status update even if there isn't class.*
 4. Submit your requirements specification as scheduled (by you); obtain instructor approval.
 5. Complete the project as proposed and as specified in your requirements.
 6. Demonstrate your work to the instructor. Demonstrations shall be completed by the last day classes for the semester, which is the day before Testing Days.
 7. Submit your summary, including your final status update, with other promised deliverables. These items are due the first day of Testing Days at the end of the semester.
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CS 499, CS 499A - Senior Project Proposal

And make proposals for peace unto those who have smitten you,
according to the voice of the Spirit which is in you,
and all things shall work together for your good.
D&C 105:40

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. Include and complete the following sentences:

1. "The focus of this project is ..."
2. "The application of this focus is ..."

Note that the focus must be a Computer Science / Software Engineering topic **and** something not covered in required coursework. The focus is the general principle you will be researching (e.g., image processing). The application of the focus is the product you will create that demonstrates the understanding you have gained from that research (e.g., facial recognition). Do not confuse focus and application. You will provide additional detail regarding your focus and its application in section 8.

3. **Background**

Provide information essential to understanding your project. This includes, but is not limited to, the following:

1. Definitions
2. Why this topic is of interest
3. Prior work by others
4. 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. 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 evidence of design 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. Specify the estimated cost for each resource.

10. **References**

Provide a bibliography of reference material. This section is not optional. Provide evidence of your preliminary research.

CS 499, et al. - Senior Project 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.**

Visual and verbal: unless you are taking CS 499 et al. remotely, display and discuss your status update in class.

Written: submit the status update electronically (use submit in the Linux computer lab).

Use the format given below.

*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										
task										
task										
task										
total hours										
Accomplishments										
Problems										
Changes in Scope, Schedule, and Cost										

Confessional

Increase in actual hours since last update:
Total anticipated actual hours (at the end of the project):
Behind schedule / On schedule / Ahead of schedule

Scripture

CS 499, CS 499A - Senior Project Requirements Specification

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

Use shall, will, and may in the requirements specification. When I review your requirements, I assume that shall requirements shall be implemented. I also assume that will and may requirements will not be implemented.

Include at least one requirement regarding execution time. For example, the product shall calculate the answer within one second.

Format your requirements specification in four columns, as follows:

1. A unique identifier for the functional requirement; sequential numbers work well
2. Functional requirement (note: if the demonstration requires reviewing code, it's not a functional requirement)
3. Demonstration scenario(s) for that requirement
4. Success measure(s) for that requirement

Use a separate row for each requirement.

Do not submit as a spreadsheet. Use a word processor.

The requirements are due on the date specified in your proposal.

CS 499, CS 499B - 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 (can be a separate file)
- Summary of all scope changes (since proposal)
- List of deliverables (from proposal; note any changes)
- Known bugs and recommended enhancements
- Discussion of how your work satisfies what you proposed
- Summary of what was accomplished
- What you learned from doing the project

Submit your summary and deliverables to `/home/twitchellk/cs499/deliverables/your_user_id/` where *your_user_id* is your Linux login ID. Since you own this directory, you can copy your files directly to this location. You do not need to zip or tar, nor do you need to use submit.

CS 499, et al. - 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 satisfies 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 (if you haven't taken CS 312)
- artificial intelligence / neural nets / machine learning (if you haven't taken CS 490R)
- computer / network security (if you haven't taken CS 470)
- bioinformatics
- genetic algorithms
- concurrent / parallel computing
- distributed operating systems / applications
- embedded computing
- real-time programming
- machine vision / image processing
- mobile app in connection with one of the above
- cooperative effort with the ECEN senior project

Q Are there some topics I should avoid?

A Games.
Natural language.

A word of warning: artificial intelligence must display intelligence!

General Homework Instructions

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

Formatting

- Include your name in every assignment.
- 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.
Pdf is not an acceptable format (except as noted in homework assignment descriptions).
- Use a black 12-point proportional-spaced serif font (e.g., Garamond or Palatino Linotype).
- Conserve electrons! Save trees! (*unless instructed otherwise*)
 - No title or cover page.
 - No table of contents.
 - No index.
 - Do not start a new section on a new page.
- The required length is exclusive of
 - headings,
 - figures,
 - graphics,
 - tables,
 - charts,
 - endnotes,
 - works cited,
 - bibliography, and
 - anything like unto the above.

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. Example:
 - submit whateverYouNamedIt.xyzwhere whateverYouNamedIt is your file and xyz is the appropriate extension.
- It is your responsibility to submit homework correctly, including, but not limited to, the correct content, 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* 7:32 AM the next school day. (Note this is the next school day and not the next class 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](#)). If more than one copy of an assignment is submitted, I will grade the last one submitted. 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!
 - stake holder and stakeholder
 - accept and except
 - affect and effect
 - as rather than as being
 - based on rather than based off of
 - 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 antecedent.
- A serial (Oxford) comma is required (e.g., CS 308, CS 364, CS 432, and CS 499).
- With the exception of source code, a space shall precede the opening parenthesis ().
- 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, et al. - 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 1) or CS 416 (Software Engineering 2) or CS 432 (Software Engineering 3)

Required Text(s)

- none

CS 499 Grading

- 70% Project (includes approved proposal and summary)
- 10% Requirements specification, submitted as scheduled
- 20% Status Updates

CS 499A Grading

- 50% Hours (two-thirds of the CS 499 requirement for hours)
- 25% Requirements specification, submitted as scheduled
- 25% Status Updates

CS 499B Grading

- 80% Project (includes approved proposal and summary)
- 20% Status Updates

[Disabilities](#)

[Gender-based Discrimination and Sexual Harassment](#)

Policies

Learning

- *"We are prepared for some things, and we receive just as fast as we prepare ourselves."* --Brigham Young
- **Learn how to learn!** Learn to develop alternative solutions and implement the most appropriate one. Computer Science means life-long learning. Learn to enjoy it now.
- Please control compulsions to answer every question posed in class. Allow your classmates to participate in class discussions. Elder Neal A. Maxwell taught, "On occasion, the biting of the tongue can be as important as the gift of tongues."

Grading

- My grading philosophy: If you cause me extra work, you pay for it.
- Do not ask me to pre-grade your assignment. I will answer specific questions about your work before you submit it. However, I have enough difficulty grading your work once and I certainly am not going to do it twice.
- Your grade is based on your product, not the amount of time you expended developing the product.
- My approach to grading is based on the competent programmer hypothesis, which is that competent programmers write programs that are close to being correct. When I grade, I concentrate on finding the little errors. The big errors are easy to find, for both you and me.
- The final grade for homework assignments is the ratio of total earned points and total possible points.
- The following grading scale is used:
 - A - nineties and one hundred
 - B - eighties
 - C - seventies
 - D - sixties
 - F - 59 and belowIf the final digit is 7-9, a "+" (e.g., 88 is a B+).
If the final digit is 0-2, a "-" (e.g., 61 is a D-).
There is no A+, F+, or F-. The letter grade is obtained using rounding (e.g., 89.6 is an A-).
- Homework assignments are to be completed as scheduled. Late work is generally not accepted. However, assignments may be rescheduled for a *limited* number of *emergency* situations *if you discuss your situation with me before* (not on and especially not after) the scheduled due date. There will be no routine extensions of due dates - be prepared to justify any requests for extensions.

Miscellaneous

- Please don't embarrass me by putting me into a position where I will embarrass you with regard to the Honor Code (including dress and grooming standards).
 - For me, assisting students has first priority. Grading has a lower priority than assisting students. I apologize for when I do not grade and return your work quickly.
 - If you feel a need to stand during class, you may do so. If it will help you stay awake, please do so.
 - Employment and internship information is available on the bulletin board by the Linux computer lab (213 AUS).
 - My office hours start when I arrive and terminate when I leave. If my office door is open, and it usually is, please come in.
 - I am willing to write a letter of recommendation for you if you have taken at least three credits of coursework from me in the current or previous semester.
 - Henry David Thoreau wrote, "As if you could kill time without injuring eternity." When you feel an urge to kill time, please control the extent of the damage. You don't have a right to injure anyone's eternity but your own.
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Disabilities

Brigham Young University-Idaho is committed to providing a working and learning atmosphere that reasonably accommodates qualified persons with disabilities. If you have a disability and require reasonable accommodations, please contact the Disability Services Office at (208) 496-9210. Reasonable academic accommodations are reviewed for all students who have qualified documented disabilities. Services are coordinated with the students and instructor by the Disability Services Office.

More information is available at <http://www.byui.edu/disabilities/disability-services>.

Gender-based Discrimination and Sexual Harassment

Sexual harassment refers to unwelcome conduct of a sexual nature. Sexual harassment may include 1) unwelcome sexual advances, 2) requests for sexual favors, and 3) other verbal, non-verbal, or physical conduct of a sexual nature. Sexual harassment may also include denying or limiting, on the basis of sex, the student's ability to participate in or receive benefits, services, or opportunities in university programs. BYU-Idaho's policy against sexual harassment extends not only to employment situations but to academic situations as well. If a student feels he or she has encountered sexual harassment or gender-based discrimination, or if the student needs assistance or information related to allegations of sexual harassment, he or she should contact the Student Honor Office at 208-496-9300 or sho@byui.edu. Feel free to visit their web site at <http://www.byui.edu/studenthonor>.
