

Contract for CSS 497

Computer Science and Software Engineering Capstone



UNIVERSITY of WASHINGTON | BOTHELL

COMPUTER SCIENCE & SOFTWARE ENGINEERING

18115 Campus Way NE · Box 358534 · Bothell, WA 98011-8246
(425) 352-5279 <http://www.uwb.edu/css>

SECTION A		STUDENT INFORMATION	
Asefaw, Bisrat		1972554	
Full Name (Last, First)		Student ID	
STOP: Are you ready for your capstone experience? Have you completed all core courses and 10 credits of CSS electives? (please check answer) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
If you are missing any of the required prerequisite courses (CSS 301, CSS 342, CSS 343, CSS 350, CSS 360, CSS 370, CSS 422, CSS 430, and 10 credits of CSS electives), you must speak with your faculty advisor about whether you will have the necessary skills for your capstone. If (1) your faculty advisor feels that you will be prepared and (2) your missed classes match any of the cases a-d in the following table, then <u>you must provide a justification in Section E of this contract.</u>			
Case	Core missing	Electives missing	Action
a	1 course	0	Justify in 497 contract
b	0	5 credits	Justify in 497 contract
c	1 course	5 credits	Justify in 497 contract
d	0	10 credits	Justify in 497 contract
e	2 courses	0	Justify in petition form
f	All other cases		Capstone denied in most cases. See CSS Academic Advisor
If you are missing two core courses (case e), but your faculty advisor feels that you are ready to begin your capstone, you must submit a Course Petition form to the CSS Academic Advisor.			
Capstone contracts submitted by students missing more than two prerequisite courses (case f) will be denied.			

SECTION B		CREDIT DISTRIBUTION (Credits from all quarters must equal 10)						
First Quarter			Second Quarter*			Third Quarter*		
Winter	2021	10						
Quarter	Year	Credits	Quarter	Year	Credits	Quarter	Year	Credits
Grade Option (Check only one)			<input type="checkbox"/> Decimal <input checked="" type="checkbox"/> CR/NC					
Faculty Advisor: Dr. Arnold Lund								

* NOTE: The grade will be an "N" grade (meaning in progress) until the end of the term in which the student has completed both (1) their CSS 497 AND (2) their CSS 497 prerequisites.

SECTION C

CAPSTONE INFORMATION

Please answer the following questions regarding your proposed Capstone project.

Project Title:	Homeless Shelter application			
Option: (Circle/highlight one)	1 Sponsored Capstone	2 Current Employer	3 Faculty Research	4 Individual Project
	5 Group Project			

Capstone Sponsoring Organization(s): N/A

Did you sign a non-disclosure statement or agreement with the Sponsoring Organization? Yes

No

Brief Description (75-125 words)

Our idea came about helping homeless people during the COVID-19 pandemic. We want to create a database which can be used by the staff at shelters, but also display important information which could be viewed by anyone such as COVID-19 related news, confirmed cases, and air quality index. To do so, we must do the following:

1. Design a website, requirement definition & analysis (CSS350, CSS370, CSS480)
2. Implement a website using HTML & CSS (CSS481)
3. Generate database based on RM and ERD constraints using SQLite (CSS475)
4. Store Database and inserts in Microsoft Azure
5. Generate possible database test cases and test them
6. Display Database on site using JavaScript (CSS342, CSS 343)
7. Display air index, COVID-19 confirmed cases, and news on site (CSS432) extra
8. Implement website security (CSS310) extra

SECTION D

Please answer the following questions regarding your proposed Capstone project.

Answer every question in detail directly after the question (refer to

<http://courses.washington.edu/css497/contract.html>). Please describe clearly and with grammatically correct, complete sentences. Hand written contracts will not be accepted.

1. Describe the capstone.

a. Include any relevant background information.

Our idea came about helping homeless people during the COVID-19 pandemic. We want to create a site that can be used by staff at homeless shelters, but also by anyone who isn't staff. We would implement a database into our system which would allow staff to store information about homeless people, staff, donations, and good stock.

In addition, we would like to implement website functionality that displays information about the quality of air, COVID confirmed cases, news, and COVID testing sites.

b. Clearly describe the benefits of the proposed project (e.g., 'What is this project going to accomplish?').

Our project would test our knowledge of the skills acquired over our time at UW Bothell. We will have a chance to demonstrate those skills by defining the requirements, designing, implementing, testing, and refining our application.

2. Provide a clear, detailed description of the academic merit of proposed project. Academic merit is defined as ways in which you will further develop your core and advanced technical competencies. Please list the competencies you will focus on and provide a brief description of how each one will be further developed by your involvement in this project. (For more information, see "Core & Advanced Competencies" at www.uwb.edu/bscss/css497/student-guide/competencies)

- **Core competencies**

- **Core General**

- **Analysis & Problem-Solving Skills**
 - **Information Gathering:** We will conduct research to aid us in creating a robust application to allow us to design, implement, test, and change.
 - I will do research using a combination of survey and interview on what data are we going to store in our database and what are the most searched information's by user so that we can design based on user needs. Based on the information I collected and existing applications, I will design and implement database for our project.
 - **Creativity:** We will have the opportunity to explore and implement different functionality on our application.
 - I will specifically do the usability research on functionality implement and I will analyze findings and provide my team with the final result of my research so that we can alter functionalities based on these new findings. I am hoping to learn more on types of usability researches and learn these web-development tools
 - **Learning by Doing:** Each one of us will explore different tools, coding languages, and design theories to help us implement our application.
 - Doing this project, I will learn new web development tools like SQLite, CSS, HTML and networking concepts. I will do the database design and implementing, and help in HTML, PHP coding. I will do an independent study on how to manage software versions in GitHub, and different high fidelity designing websites.
 - **Interpersonal Skills**
 - **Collaboration & Team Building:** During our time at UW, we've worked on many projects for countless classes. This has taught us the importance of working together as a team to create a final product. This is exactly what we will be doing for our capstone, we will design, implement, test, and change functionality as a team.
 - Since we are developing iteratively in applying agile methodology, I will get a chance to learn all the software development tools and techniques that we use throughout the SDLC. I will participate equally in all the SDLC stages.
 - **Leadership:** Each one of us will practice leadership practices by meeting as a group to help us determine the importance of functionality, project changes, and help us mitigate issues.
 - Each of us have equal responsibility and ownership of our product and each one of us has the ability to make decisions and discuss on new

ideas. I am hoping to further improve and learn new skills on decision making, ownership, collaboration, teamwork and support.

- Managing Change & Uncertainty: Each one of us may certainly run into design or implementation issues, using leadership practices, we will be able to mitigate any changes to help us complete our work. Through this each one of us will have the opportunity to learn teamwork and collaboration.
 - Writing: We will need to communicate and keep track of our project goals, problems, and progress within our project documentation.
 - Each one of us will have the responsibility to constantly communicate through discord, come to the weekly stand-up meeting, and present individual progress to the team.
 - Listening: We will listen to any feedback provided by the user survey to help us determine if changes need to be applied.
 - Each team member will be open to get feedback from team members, primary, and secondary users, and should work on enhancing them.
 - **Management Skills**
 - Project Management: We will need to use project management theories and techniques to facilitate online collaboration.
 - Decision Making: We will need to pick and prioritize functionality based on project status and new problems that may arise.
 - Each team member has full ownership of the project and has responsibility to make and track any changes that are made during the SDLC.
- **Core Technical**
 - Technology Evaluation & Selection: Each one of us will assess tools to determine which ones are appropriate for our application.
 - Each team member is going to learn any technology used to develop our product.
 - Software Architecture: We will need to decide on the project architecture design and decided on a development methodology (agile – Scrum/Kanban).
 - Social Implications of Technology: We will create user surveys to let us know how users interact with our system. This is important information because we want our design to be user friendly.
 - Technical Writing: We want to use professional, consistent, and user-friendly language throughout our application.
 - **Advanced Competencies**
 - Requirements Definition & Analysis: We will define functional and non-functional requirements for our application.
 - I will do individual research and define a functional and non-functional requirement of our project and after we have finished defining the functionalities of the website, we will collaboratively design each UML diagrams of the project (use-case , robustness, activity diagrams).
 - Object-Oriented Programming Methodologies: Organize and group functionality into classes related to each other. 6

Functional Design: We will need to design how functionality will interact with the site and other functionality.

- Testing Methodologies: We will use test queries to test our database, PACT to analyze our design, and test cases to test our software functionality
 - Each of us will provide our own test file that has different cases, and we will merge our test files after each case passes and team decides to close specific functionality testing.
- Graphical Design and Interpretation: We will be incorporating graphical design into our application to improve the design. Each one of us is responsible to discuss any graphical design that needed to impellent.
- Database Design: we will design a database for our project in both logical and conceptual data modeling and normalize tables based on what we learned in CSS 475. Each one of us is responsible for database design and implementation.
- Database Reporting: we are going to use the MySQL database to create and fill out every table in our database.
- Interface Design Principles: We will incorporate methodologies, principles, and theories learned in CSS480 such as cultural awareness. Each one of us are familiar with interface design, testing and implementation there fore we both are responsible to collaborate.
- Software Development Methodologies: We will need to determine what software development methodology to use, we think agile would work well since we are a team of two. This project will help us to explore and practice agile methodology.

3. Identify what specific software development tools you will use to complete this project and describe why they are appropriate.

- GitHub
 - For version control. Since we are developing iteratively, we are going to save every new version developed on GitHub and it is easy to trace development.
- Database
 - For storing data that is gathered from different sources. We will normalize our data by doing Logical and conceptual data modeling.
- MySQL workbench
 - For creating tables, retrieving, and organizing data from the database, and working with saved data in our database.
- PhpStorm(HTML5 + CSS + PHP + JavaScript)
 - We use this to implement the website and retrieve data from the database. We use these applications for implementing different functionality and features to the website.
- Linux
 - For controlling different versions of our software since we are developing in agile technique.
- Xcode or Clion (C++)
 - For implementing all types of functionalities and defining objects and classes in our project.

4. List all computer equipment, office/lab space, human resources and/or financial support that are required to complete this capstone.

1. Laptop/desktop Computer
2. Internet/Wifi connection
3. Financial Support for subscription and/or buying software tools like designing, developing, and maintaining software tools
4. Office/lab space

5. Provide a list of potential barriers and/or problems that may slow down or potentially prevent the successful completion of this capstone.

- Disagreement on ways of implementation/ teammates might have a different opinion on the way of implementing a feature
- Communication barrier/ problem making research because of COVID
- Data Loss
- Unexpected change
- Financial problem

- Software integration
 - Project management and test environment
6. Provide a detailed project plan including proposed deliverables and due dates. The deliverables must include the date of the colloquium you plan to observe before the quarter in which you plan to present, and the date of the colloquium when you plan to present.

Reports	Start date	end dates	Detail description
Sprint 1	Jan 4	Jan 14	Make research on the user and list out functional and non-functional requirements, do a High fidelity and Low fidelity testing on the prototypes
Sprint 2	Jan 14	Jan 24	Do documentation for and UML diagrams for the system and specific functionality of the product.
Sprint 3	Jan 24	Feb 05	Iteratively develop and do usability research on the low-level development (the first deliverable starts with limited features) and report to stakeholders (Advisor)
Sprint 4	Feb 05	Feb 20	Document all the progress and do a second implementation of new features and reporting to stakeholder
Poster, Presentation	Feb 20	Mar 01	Do a mock presentation for professor Lund and get a final review or comment on our project
Final Report	Mar 01	Mar 10	Present the whole project with all complete features

7. Describe the methods and criteria you propose for the evaluation of this capstone. Be specific.

1. Have a timeline for every milestone of the project
2. Complete and correct deliverables
3. Document progress and report at the end of every sprint
4. Develop project features iteratively and report
5. Meet faculty advisor expectation and deliver a successful product

SECTION E *Please complete this section if you are missing any of the Capstone prerequisites (cases a-d from Section A).*

To be completed only if you are missing prerequisites for CSS 497 (these courses are CSS 301, CSS 342, CSS 343, CSS 350, CSS 360, CSS 370, CSS 422, CSS 430, and 10 credits of CSS electives). Please write clearly and in grammatically correct, complete sentences.

1. Explain why the course(s) you are missing will not affect your capstone experience. That is, look at the course descriptions for the classes you have not taken and explain why you don't need that specific knowledge to be successful in your capstone.

2. Complete the table below to indicate (a) how you will spread out the CSS 497 prerequisites courses and (b) when you plan to take the prerequisite course(s) you are missing.

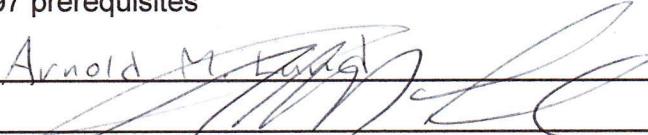
CSS 497 Capstone	<u>Winter, 2021</u> (Quarter, year)	(Quarter, year)	(Quarter, year)	(Quarter, year)
(a) CSS 497 Credits (identify CSS 497 credit hours to be applied by quarter)	10 credits			
(b) Capstone prerequisites (indicate when you plan to take remaining core + elective course(s))	N/A			

NOTE: Your last CSS 497 credits must be completed in or after the quarter you complete your last CSS 497 prerequisite. You will receive an "N" (meaning in progress) in all of your CSS 497 credits until you complete any missing prerequisites. If you have any questions as you fill out this table, talk with your CSS advisor.

3. Obtain the approval of your faculty advisor.

NOTE TO FACULTY ADVISOR: By signing below, you indicate that, in your opinion, this student is sufficiently prepared for their rigorous, academically challenging capstone project. Give an "N" grade (meaning in progress) until the end of the term in which the student has completed both (1) their CSS 497 AND (2) their CSS 497 prerequisites

Faculty Advisor Name: Arnold M. Tsofaw

Faculty Advisor Signature: 

Faculty Advisor Email: lunday@uw.edu DATE: 12/27/20

Student Signature: Bisrat Tsofaw DATE: 11/05/2020

NOTE: Signatures are required in the Signature Section, as well.

Student, Faculty Advisor & Capstone Sponsor Statement of Agreement

1. By initialing each box, the **Student** agrees to:

- [B.A.] Perform to the best of his or her ability and to the satisfaction of the Capstone sponsor(s) those assigned tasks related to the cooperative component of this contract and adhere to all personnel rules.
- [B.A.] Perform to the best of his or her ability learning activities negotiated with the faculty advisor as stated in the contract, including communicating with the faculty advisor according to the scheduled course meetings and other scheduled events as indicated in the contract.
- [B.A.] Talk with the Capstone sponsor, faculty advisor, CSS Capstone Coordinator, and other program representatives with regard to any changes, revisions, or concerns regarding the Capstone project. Meet with the CSS Academic Advisor to complete an audit of your degree completion.
- [B.A.] Complete all deliverables as described in the contract, present a poster and an oral presentation at the CSS colloquium.
- [B.A.] Prepare a final report if required by faculty advisor. For example, a final assessment of your Capstone experience including any "lessons learned" and advice for future students.
- [B.A.] Prior to the completion of CSS 497, prepare an abstract that is approved by the faculty advisor and the Capstone sponsor. The approved abstract needs to be turned in to the CSS Capstone Coordinator.
- [B.A.] Attend a colloquium prior to the one in which you present and attend the entire duration of the colloquium at which they present.

2. By initialing each box, the **Faculty Advisor** agrees to:

- [*A*] Provide instructional support and guidance by communicating regularly with students about their on-site experiences, pertinent readings, theoretical frameworks, and project designs.
- [*A*] Utilize meeting times with the student, for example, as an opportunity to develop writing skills by reviewing one or more drafts of the final paper, Colloquium poster and presentation, and/or software project, and the abstract.
- [*A*] Approve an abstract of the project prior to assigning the course grade. At the end of each quarter, assign a decimal grade or credit/no credit grade according to the evaluation criteria identified in the Capstone Contract. (Note: these criteria are reviewed during the program approval process of the Capstone contract.) Incorporate any feedback received from the Capstone sponsor into your final evaluation.
- [*A*] Give an "N" grade (meaning in progress) until the end of the term in which the student has completed both (1) their CSS 497 AND (2) their CSS 497 prerequisites

3. By initialing each box, the **Capstone Sponsor** agrees to:

- [] Provide a good learning and training environment for the student, keeping routine work, such as typing and filing to a minimum.
- [] Evaluate the proposal and make agreements, if applicable, with the student and faculty advisor pertaining to the following: a) any and all intellectual property rights; b) non-disclosure or confidentiality of specific sponsor methods, technologies and/or business strategies; c) time-limitations for non-compete agreements between all parties; and d) acknowledgement of any and all rights to ownership of pre-existing knowledge.
- [] Work with the student and make explicit arrangements with the student concerning the overall goals described in this contract, communication with the student, expectations, and records of the student's hours and performance.
- [] Approve an abstract of the project prior to completion of the contract. Complete an evaluation of the student's performance if specified in Section D 7 and provide it to the CSS Capstone Faculty advisor.

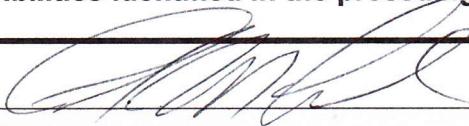
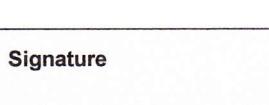
The CSS Division Capstone Coordinator will coordinate the capstone and provide administrative support services as needed by the student, faculty advisor, and Capstone sponsor.

This contract may be terminated or amended by the student, faculty advisor, or Capstone sponsor at any time upon two weeks written notice, which is received and agreed to by the other parties.

Acknowledgement of the completion of the capstone requirement for the Bachelor of Science in Computing & Software Systems will be granted for the Capstone project when the CSS 497 Faculty Advisor has determined that the student has satisfactorily completed the work outlined in Section D 7.

CSS 497 provides students with the opportunity to earn academic credit while working on a project that has potential benefits for industry or community organizations. Students learn by connecting classroom theory and community-based experience through the completion of an academic project.

We, the undersigned, have read and approved the above proposal and understand the requirements of this proposal per the responsibilities identified in the preceding 'Statement of Agreement'.

Arnold Lund		lund@uw.edu	12/27/20
Faculty Advisor	Signature	Email	Date
Bisrat Asefaw		206-503-9788	11/05/2020
Student Name	Signature	Phone	Date
1 st Capstone Sponsor Name		Title	
Company/Organization Name		Phone	
Address		City	State ZIP
Signature		Email	Date
2 nd Capstone Sponsor Name		Title	
Company/Organization Name		Phone	
Address		City	State ZIP
Signature		Email	Date
After completing the contract give to the CSS Division Capstone Coordinator, Janet McDaniel, Discovery Hall room 352 V			
CSS Division Authorization Associate Professor & Chair William Erdly erdlyww@uw.edu		Signature	Date

Although the CSS Division has taken reasonable steps to ensure a positive learning environment with sponsors, it should be understood that this Capstone agreement has potential risks. In signing this Capstone Contract, the student acknowledges inherent hazards and risks, including but not limited to physical injury and death, and assumes those beyond control of the University staff and faculty.

In case of emergency, I, the student, give my consent for emergency medical treatment and agree to pay for any charges not covered by my personal health insurance. In addition, I understand my responsibilities as described in the Statement of Agreement on the reverse.


Student Signature

11/05/2020
Date

ba22@uw.edu
Email