

## CECS 491A: Senior Project Course Syllabus - Fall 2019

**Instructor:** Vatanak Vong

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**Office Hours:** Tu 7:15PM - 8:15PM ECS 414 (additional hours can be arranged if needed)

### Course Objectives

The senior project is meant to provide students with an opportunity to collaborate on a substantive project. As such, the student will enliven the role of a software engineer and hopefully obtain skills in the areas of project management, conflict resolution, technical evaluation, requirements gathering, software development, quality assurance, system administration and client management. The goal is to provide students with experiences that simulates real-world situations so that they can develop the tools necessary to be successful in the profession.

### Course Requirements\*

Item	Points	Total Points
Sprint Review** x2	100	200
Milestones** x2	100	200
Presentation**	100	100
Misc	TBD	TBD

\* The instructor reserves the right to alter the course in any manner in order to promote learning.

\*\* Must be present in order to obtain credit unless it is an excused absence

### Grading Metrics

90%+	A
80% - 89.99%	B
70% - 79.99%	C
60% - 69.99%	D
59.99% & Below	F

Grades will follow a flat percentage rubric. Grades will **NOT** be based on a curve. All work must be submitted to the instructor in-person unless otherwise specified. Work submitted by another student on your behalf will not be accepted unless approved by the instructor in advance.

## **Absent/Make Up Policy**

Absences are excused if it complies with section 3.0 in the university's attendance policy (<http://www.csulb.edu/academic-senate/policy-statement-17-17-attendance-policy-super-sedes-01-01>). Valid documentation (e.g. doctor's note, police report, etc.) must be provided in order to excuse an absence. Attendance and participation is crucial thus submitting late work or alternative work is rarely possible. Each instance will be dealt with on a case by case basis that complies with the university's policy. It is the responsibility of the student to arrange with the instructor how to address making up missed work if the absence was excused. If the absence is "planned", then the instructor must be notified in advance.

## **Definition of Done**

The instructor's definition of a work item being done is as follows:

1. All assignment requirements are met
2. All source code & tests adheres to the course's coding standard<sup>26</sup>
3. In-line code comments are accurate, clear and concise
4. Supporting documentation are accurate, clear and concise
5. All submitted hard copies must be bounded together and paginated.
6. All submitted individual work must contain student name, student ID and date
7. All submitted team work must contain team name, team member names, team member student IDs and date

## **Project**

Team-based semester long project consisting of five to six members depending on class size. Project details will be discussed in class

## **Sprint Reviews**

Sprint reviews will be randomly performed throughout the semester. It is each team's responsibility to ensure that all team members are following Scrum and that all documentation is up to date.

### **Sprint Review grading criteria:**

- 75% - Progress is well documented and is on track for completion
- 20% - Improvement of average velocity

- 5% - Identification of obstacles and concrete steps for resolution

## **Code Review Complexity Scales**

Certain features are innately more complex than others, but the final implementation also determines how much effort was made to ensure a more extensible and well-tested feature. As such, each code review will be graded on a complexity scale. The more complete a solution is the more likely it will be categorized as on of the higher scale value.

- Critical - 125 points
- High - 100 points
- High Mid - 75 points
- Medium - 50 points
- Low - 25 points

## **Code Review Grading Criteria:**

- Completely tested through automation such as E2E tests and unit tests
- Satisfies the course's definition of done
- Design is not limited to a single implementation or only satisfying a single user story
- Performant (reduced time complexity, size complexity, etc.)
- No major security vulnerability; minor vulnerability is clearly documented and articulated during review

## **Exams & Quizzes**

Any and all exams and quizzes are always comprehensive. Students must PRINT responses in BLACK INK PEN on a 11" x 8.5" examination booklet (aka the "blue" book). Responses that are illegible to the instructor or does not follow the aforementioned "definition of done" will receive an automatic zero grade. Exams will always be for a grade and are always notified in advance. Quizzes can be for a grade or for "bonus" points. Quizzes can be scheduled in advance or administered randomly. Bonus quizzes should only be submitted if the student has high confidence in the accuracy of their response. Any submitted response that are moderate or severely inaccurate will be given a minus grade.

## **Miscellaneous Work**

For grade labs and/or homework may be assigned depending on if the class needs additional exercises to reinforce learning.

### **Cheating & Plagiarism**

Cheating and plagiarism will not be tolerated in this course. Any individual caught cheating on quizzes, homework, lab projects, or the final exam will be punished to the full extent allowed under University regulations. Plagiarism on papers or assignments is not acceptable and work that is plagiarized will not receive credit. Plagiarism is considered cheating. Note: Any time another person's work is used without giving them proper credit, it is considered plagiarism and cheating. At a minimum, any student caught cheating will receive no credit for the work concerned, and will receive a reduction of one letter grade from their final course grade. The official CSULB Policy on Cheating and Plagiarism can be found here: [http://web.csulb.edu/divisions/aa/catalog/current/academic\\_information/cheating\\_plagiarism.html](http://web.csulb.edu/divisions/aa/catalog/current/academic_information/cheating_plagiarism.html)

### **ADA Accommodation**

Students with a disability or medical restriction who are requesting a classroom accommodation should contact the Disabled Student Services at 562-985-5401 or visit Brotman Hall, Suite 270 during 8AM-5PM weekday hours. Disabled Student Services will work with the student to identify a reasonable accommodation in partnership with appropriate academic offices and medical providers. It is the student's responsibility to notify the instructor in advance of the need for accommodations. **It is strongly encouraged that students to reach out to DSS as soon as possible.**

### **Food or Housing Assistance**

Any student who is facing academic or personal challenges due to difficulty in affording groceries/food and/or lacking a safe and stable living environment is urged to contact the CSULB Student Emergency Intervention & Wellness Program. The website outlining the resources available is [www.csulb.edu/basicneeds](http://www.csulb.edu/basicneeds). Students can also e-mail [supportingstudents@csulb.edu](mailto:supportingstudents@csulb.edu) or call 562/985.2038. If comfortable, students may reach out to the professor as they may be able to identify additional resources.

## Tentative Schedule

The course will fluctuate depending on the needs of the class and timetables are subject to change.

Week	Day 1 Lectures	Day 1 Lab	Day 2 Lectures	Day 2 Lab
1	<ul style="list-style-type: none"> <li>- Course Introduction / Syllabus Review</li> <li>- Course experience</li> <li>- Instructor background</li> <li>- Confirmation of expectations and commitment from students</li> <li>- Class Intro Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Review major roles when developing a product <ul style="list-style-type: none"> <li>• Project stakeholder</li> <li>• Client (Instructor)</li> <li>• Technical advisor (Instructor)</li> <li>• Team Lead (student)</li> <li>• Recorder (student)</li> </ul> </li> <li>- Review the main phases of a software development <ul style="list-style-type: none"> <li>• Requirements</li> <li>• Planning</li> <li>• Design</li> <li>• Construction</li> <li>• Testing</li> <li>• Release</li> </ul> </li> <li>- Review Agile principles</li> <li>- Introduce SCRUM methodology</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Review Requirements Phase</li> <li>- Requirements Gathering techniques (value) <ul style="list-style-type: none"> <li>• Value</li> <li>• User Stories / Use cases / Flows</li> <li>• Functional vs Non-functional</li> <li>• Pass/Fail Criteria</li> </ul> </li> <li>- Requirements Analysis w/o technology</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Former students Q&amp;A panel</li> <li>- Homework: <ul style="list-style-type: none"> <li>• Form teams consisting of 5 members</li> <li>• Decide on the features of your product</li> <li>• Decide on team name</li> <li>• Decide on team lead</li> </ul> </li> </ul>
2	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Techniques for conducting a productive meeting</li> <li>- Requirements modeling techniques (UML Diagrams)</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Review homework from each team</li> <li>- SCRUM II</li> <li>- Lab: List the features of three popular web sites (MVP)</li> <li>- Volatility Analysis</li> <li>- Decision Tree</li> <li>- Requirements Analysis with technology</li> <li>- Homework: Decision tree for product</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Estimations techniques</li> <li>- Project planning</li> <li>- Resource planning</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Technology stack overview</li> <li>- Source Control</li> <li>- Homework: Final draft of MVP RFP</li> <li>- Homework: Setup development environment</li> </ul>
3	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Technology stack overview II</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Review final draft of MVP RFP</li> <li>- Diagram features of RFP</li> <li>- Homework: Estimate effort of all features</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Requirements analysis with technology</li> <li>- System Architecture</li> <li>- Abstraction Layers</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Lab: Design a calculator <ul style="list-style-type: none"> <li>• Additional features</li> <li>• Test plan for features</li> </ul> </li> <li>- Testing <ul style="list-style-type: none"> <li>• Business Validation Testing</li> <li>• Unit Testing</li> <li>• Integration Testing</li> <li>• Regression Testing</li> <li>• End to End Testing</li> </ul> </li> <li>- Homework: Test plan</li> </ul>
4	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Core components</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Review Test Plan</li> <li>- Client time: Core component requirements <ul style="list-style-type: none"> <li>• Error Handling</li> <li>• Logging</li> <li>• Data Access</li> <li>• Authentication</li> <li>• Authorization</li> </ul> </li> <li>- Homework: Project road map</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Technical Advisor <ul style="list-style-type: none"> <li>• Error Handling</li> <li>• Logging</li> <li>• Data Access</li> <li>• Authentication</li> <li>• Authorization</li> </ul> </li> </ul>

Week	Day 1 Lectures	Day 1 Lab	Day 2 Lectures	Day 2 Lab
5	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Core Components</li> <li>- SOLID</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Client time: Confirm</li> <li>- Lab: Apply to calculator example</li> <li>- Single Responsibility</li> <li>- Open/Close</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- SOLID II</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Liskov's Substitution</li> <li>- Interface Segregation</li> <li>- Dependency Inversion</li> <li>- Lab: Apply to calculator example</li> </ul>
6	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Architectures</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Architectures</li> </ul>
7	<ul style="list-style-type: none"> <li>- Milestone 1 Review</li> </ul>	<ul style="list-style-type: none"> <li>- Milestone 1 Review <ul style="list-style-type: none"> <li>• Project Plan</li> <li>• Tech Spec</li> <li>• Design Document</li> <li>• Test Plan</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Milestone 1 Review</li> </ul>	<ul style="list-style-type: none"> <li>- Milestone 1 Review <ul style="list-style-type: none"> <li>• Project Plan</li> <li>• Tech Spec</li> <li>• Design Document</li> <li>• Test Plan</li> </ul> </li> </ul>
8	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Interfaces vs Base Clases vs Generics</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Data Access Objects</li> </ul>
9	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Services vs Managers vs Engines</li> <li>- Refactoring</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Implicit vs Explicit coding (developer intensions)</li> </ul>
10	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Constants vs Enumerations</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Authentication / Authorization</li> </ul>
11	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Good vs Bad Code</li> <li>- Multi-threading</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Performance</li> <li>- Scalability</li> </ul>
12	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Test data</li> <li>- Data Seeding (Manual)</li> <li>- Data Seeding (Automation)</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Automated testing</li> </ul>
13	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Deployment</li> <li>- UI / UX</li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- CI/CD</li> </ul>
14	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Interview Tips</li> <li>- Milestone 2 Review <ul style="list-style-type: none"> <li>• Code Review</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Answer questions from previous class</li> <li>- Slides</li> </ul>	<ul style="list-style-type: none"> <li>- Negotiation Tips</li> <li>- Milestone 2 Review <ul style="list-style-type: none"> <li>• Code Review</li> </ul> </li> </ul>
15	<ul style="list-style-type: none"> <li>- Milestone 2 Review</li> </ul>	<ul style="list-style-type: none"> <li>- Milestone 2 Review <ul style="list-style-type: none"> <li>• Code Review</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Milestone 2 Review</li> </ul>	<ul style="list-style-type: none"> <li>- Milestone 2 Review <ul style="list-style-type: none"> <li>• Code Review</li> </ul> </li> </ul>
Final	Presentation			