

**HOFSTRA UNIVERSITY**  
**DEPARTMENT OF COMPUTER SCIENCE**

All about the Senior Design Project

The senior design project is a capstone experience required of students in all undergraduate programs in the Computer Science Department with the exception of the B.A. Track I. Also, some concentrations require the completion of the senior design project (even for the B.A. Track I). This project is spread over two consecutive semesters and may be initiated in either the Fall or the Spring semester of any academic year. As a design project, the end result should be a clearly defined software and/or hardware artifact.

The prerequisite courses for senior design project are CSC 190 (Software Engineering) and at least one CSC technical elective. Successful completion of the project depends on a thorough understanding of software engineering processes.

The senior design project is a **team project**. A senior design project team must have at least two team members, preferably three or more. Your senior design project team should have a faculty advisor. Any full-time or adjunct faculty member in the Computer Science Department may be chosen by your team as a faculty advisor, subject to the availability of the faculty member for the project. Your team will choose the topic/aim for the project in consultation with the faculty advisor.

**CE students must do a senior design project in embedded and/or mobile systems, computer architectures, GPUs, FPGA or VLSI design, parallel and distributed systems, networking, high-performance computing, or system security. CE projects must have a strong design component at the intersection between software and hardware. A purely software development project will not satisfy this requirement.**

In the first semester of the senior design project process, you should register for the two courses below:

- CSC 197A (the first part of the project course): Before you register for 197A:
  1. Find a team (fill out Appendix A form)
  2. Find an idea (read Appendix B – past projects, fill out Appendix C – your idea)
  3. Find an advisor (fill out Appendix D – list of faculty advisors and their interests).
  4. Hand or email filled out forms A, C and D to Prof. Doboli by end of the semester prior to your first senior design semester or by middle of it if you are missing any of 1, 2 or 3 above.

After all these, you can register in the section that is specific to your team's advisor. These sections are closed, you need a closed course form to register.

**When you are ready to register or if no section exists with your advisor's name on it, ask your advisor to email Mrs. Lynda Callahan your names.**

- CSC 198F (the first part of senior seminar): Before you register for 198F:
  - Contact your CSC faculty advisor to go over your graduation plan and make sure you are on track to graduate in two semesters.

**After that, you may register in any of the sections with the condition that all of your team members must be in the same section.**

In the second semester, you should register for these courses:

- CSC 197B (the second part of the project course): As in 197A, register in the section that is specific to your advisor.
- CSC 198S (the second part of senior seminar): Same rules apply as in CSC 198F.

While the schedules for CSC 198F and CSC 198S are fixed by the department, you and your advisor will decide when and how often to meet for CSC 197A and CSC 197B.

The grade for a successfully completed CSC 197A will initially be PR (indicating progress). When the final grade for CSC 197B is determined, the PR for CSC 197A will be altered to reflect the same grade as for CSC 197B. The grades for CSC 198F and CSC 198S are independent of the grades you receive for CSC 197A and CSC 197.

For further questions, contact your department faculty advisor or Prof. Dobioli.

## **FAQ:**

### **a) How to find a team:**

Fill out the form in Appendix A and give it to Mrs. Lynda Callahan. This will allow us to find good matches with other students looking for a team.

### **b) How to come up with a good project idea:**

- Start with your skills and interests.
- Come up with one or two general domains.
- Identify one or two interesting problems in each of those domains.
  - A good senior design problem is one that is feasible for your team to design and implement in two semesters. In Appendix B you will find sample project ideas from the past.
- Come up with a general idea of your solution to the problem. Do some research on existing solutions.
- Identify the main features of your solution.
- Identify the main hardware/software resources you would need.
- Identify the main technical skills you would need.
- Fill out the form in Appendix C for each idea you have.

### **b) How to find an advisor:**

Look at Appendix D for the main interests of our full time and adjunct faculties. Please contact the faculty with closest interests to your starting ideas and discuss with them. Bring Appendix C form to your meetings. If they agree to advise your team, then talk to Mrs. Callahan to register to the section of 197A assigned to your advisor.

**Appendix A**

**Application for Senior Design Project**

**Date** \_\_\_\_\_

**Name** \_\_\_\_\_

**Major** \_\_\_\_\_

**Semester and Year you want to start senior design:** \_\_\_\_\_

**Graduating Semester/Year** \_\_\_\_\_

**Semester and Year you took CSC 190:** \_\_\_\_\_

**Technical electives taken:** \_\_\_\_\_

**Technical skills:**

**Proficient (over 5,000 lines of code):** \_\_\_\_\_

**Intermediary (over 3,000 lines of code):** \_\_\_\_\_

**Beginner (less than 2,000 lines of code):** \_\_\_\_\_

**Describe significant projects/work experience:**

**Interests regarding senior design project:**

**List other team members (if known):** \_\_\_\_\_

**Faculty advisor name (if known):** \_\_\_\_\_

**Check here if you are looking for team members :** \_\_\_\_\_

**Check here if you are looking for a faculty advisor:** \_\_\_\_\_

## **Appendix B: Sample senior design project ideas from past years**

1. A phone app using Alexa to answer questions about Hofstra (Spring 2018)
2. A web app that checks the strength of your passwords, compares it against a database of vulnerable passwords. (Spring 2018)
3. An autonomous travel bag that follows its owner using Bluetooth (Spring 2018, CE).
4. A port scanner and a related app to monitor all ports of a computer (Spring 2018).
5. A web app that allows users to document and share their trips by accessing google maps and importing pictures or tweets along their way (Spring 2018).
6. An iPhone app where users can take hand-written notes, drawings, store and organize them (Spring 2018, CE).
7. A web app that allows students to exchange textbooks (Spring 2018).
8. A deep learning method and a web app to generate new music (Fall 2018).
9. A web browser extension to alert if you are trying to access a fake web site (Fall 2018).
10. A system for multiple Hololens users to manipulate the same scene and objects (Fall 2018).
11. An iPhone app to rent real estate through smart contracts (Fall 2018).
12. An application that translates English natural language into sign language grammar (Spring 2019).
13. A web app for seniors to apply for health insurance (Spring 2019).

**Appendix C**

**Senior design project idea form**

Semester \_\_\_\_\_ Year \_\_\_\_\_ CE \_\_\_\_\_ CS \_\_\_\_\_

Team members (name/major) \_\_\_\_\_

Faculty advisor \_\_\_\_\_

**Problem description:**

**Related solutions:**

**Vision of your solution:**

**Main features of your solution:**

**Hardware resources:** \_\_\_\_\_

**Software resources:** \_\_\_\_\_

**Hardware required skills:** \_\_\_\_\_

**Software required skills:** \_\_\_\_\_

**Known skills (skill/name):** \_\_\_\_\_

**Unknown skills:** \_\_\_\_\_

**Plan to learn the unknown skills prior to second semester of senior design:**

## Appendix D

1. Parallel computing, advanced computer architectures, embedded systems and IOT, heterogeneous computing systems and clusters (contact Prof. Segal).
2. Computer vision, scene/event understanding (contact Prof. Kamberova).
3. Cybersecurity or automated software testing. Potential projects: automated scanning of web app vulnerabilities. (contact Prof. Fu).
4. Artificial intelligence, neural networks, cognitive science, information retrieval and machine learning for text processing (contact Prof. Doboli).
5. Mobile and web apps that include data mining, data analytics; applications of raspberry pi and other single board computers; use of Amazon Alexa and OK Google services (contact Prof. Krish).
6. Programming Languages, Networking (systems level), Amazon Alexa skill building (contact Prof. Liang).
7. Automata and language theory, theory of computation (Prof. Ostheimer).
8. Operating system, Cloud Computing Infrastructure, High-performance Computing, Parallel and Distributed Computing (contact Prof. Jianchen)
9. Gaming or embedded systems (Prof. Currie)
10. Web and mobile application development (Prof. Re)
11. Advanced software engineering or computational finance (contact Prof. Jeffreys).
12. Recommender systems, semantic web, big data and prescriptive analytics (contact Prof. Lindo)