About the PSU CS Capstone

The PSU Computer Science Capstone course is a 20 week "real-world" software development experience. Teams of 7-8 students work together to solve a problem posed by an outside sponsor. In cooperation with the sponsor, the students develop requirements, design a solution, write software, validate the software, and deliver it in a ready-to-use form.

The Capstone is one of the last Computer Science courses taken by our undergraduates. These students have all substantially completed an undergraduate degree program in Computer Science. They have already taken a software engineering COURSE that taught them basic software development skills.

Capstone students are expected to work a minimum of 12 hours per week over roughly 15 weeks; thus, each team will put in well over 1,000 hours or more over the duration of the project.

Capstone teams are formed by the Capstone instructor, and are the instructor's responsibility. However, each team will have a student Team Lead, selected by the instructor, who will be responsible for most team and project management. They will meet regularly with the instructor, and will provide regular written reports.

About Capstone Sponsors

Anyone that could provide a skilled, motivated team of developers with an interesting software project to tackle is invited to apply as a Capstone sponsor. Our sponsors have ranged from experienced software developers from local tech firms to community members that have never written a program in their life.

Sponsorship is free of charge. The principal expectation of the sponsor is that they identify a contact person and a backup contact person. At least one of these should meet regularly with the team to provide information and discuss progress - preferably weekly. This is particularly critical during the early stages of the project, but is important throughout the 15 week effort.

The students are expected to handle the technical side of the project on an end-to-end basis, from initial requirements elicitation through delivery. All that the sponsor needs to do is provide a well-defined problem that has a software solution.

Intellectual Property

The student developers retain the rights to all intellectual property (copyrights and patents) that they develop as a course of their work. Portland State University disclaims all ownership. Students are expected to provide sponsors with a nonexclusive license to use and modify the
software. Students and sponsors are encouraged to agree on open source licensing (we suggest the MIT license).

No Mission Critical or Phase Based Projects

While our Capstone project success rate is very high (and most failures are due to sponsor issues), we cannot promise that a given student team will not fail. Therefore, sponsors should not propose projects whose failure would cause a serious problem. The ideal project is something on the sponsor's "wish list" of things they would like to have but don't have time or money to have developed in-house.

Because we want the students to have a realistic software development experience, we cannot accept projects that are "just coding", "just QA", static websites, etc. (Web apps are fine, of course.) The students need to be able to develop the project through its entire life cycle. We also cannot accept projects that aren't, in the main, software projects. Our students have a wide range of software experience, including web app and mobile development, but it is up to the sponsor to provide any domain knowledge the students need.

About the Capstone Process

Capstone sponsorship is a competitive process. In the fourth and fifth weeks of the course, sponsors will give 15-minute in-class talks describing their proposed project with student follow-up during the succeeding weeks. The student teams will present their top project preferences to the instructor for assignment in the sixth week, and have a kick off meeting with their sponsor in the seventh week. There are typically 1.5-2 times as many proposing sponsors as teams.

In general, students are looking for a project that fits their skill set, and a sponsor they can work well with. It is hard to predict what the students will select, so generally it is better that sponsors not worry about it and just propose something. The Capstone instructor can help the sponsor figure out what ideas to present and how to increase their appeal.

There will be two student presentations, one at the halfway point at the end of the first quarter, and the other at the end of the project. Sponsors are encouraged to attend both of these. The presentations are open to the public.

How to Propose a Capstone Project

Send the Capstone Instructor a short (no more than one page) description of the project you’d like to propose. If it is a software product, of the appropriate level for a team of 4th year Computer Science undergraduates, and the sponsor appears to have the appropriate expectations of the project, you’ll probably be asked to make a presentation to the class. Many sponsors use Power Point, but it is not mandatory. However, sponsors have only 15 minutes and class sizes are typically 50-60, so you need to use your time both effectively as well as efficiently.
Because the process is designed so that about half the projects don’t get picked, we discourage sponsors from investing large amounts of time into pre-selection activities. So we don’t need detailed specifications, precise wireframes or extensive technology surveys until and unless your project is selected.

**What Kinds of Projects Have Been Built in the Past?**

Since we started requiring CS students to participate in a Capstone experience in the late 1990s, we’ve produced well over 150 Capstone projects. Here is a small sample:

Emergency Response Game for Clark College Emergency Services
web.clark.edu/emgames/Visual Training/index.html

Cel.ly Book Marklets for Cel.ly
cel.ly/

PSAS flight computer software for Portland State Aerospace Society
www.youtube.com/watch?v=UYwBDAEyGo

BuddyUp
psuvanguard.com/news/buddyup-at-psu/

Various FirefoxOS Projects for Mozilla
autonome.wordpress.com/2014/04/17/firefox-os-and-academic-programs/,

Various Portland Observatory Android Apps
play.google.com/store/apps/developer?id=PEDALPDX+TEAM&hl=en
play.google.com/store/apps/details?id=org.leifolson.withinreach&hl=en

Bookbranch
bookbran.ch/

BallotPath
www.oregonlive.com/politics/index.ssf/2014/06/ballot_path_looks_to_empower_g.html

**Important Questions to Answer if You Are Interested in Becoming a Sponsor**

1. Do I have a well-articulated idea of what I am looking to have built? If you can’t explain, in general terms, what the final product would look like, a sponsor proposal may be premature.

2. Do I have the time to personally invest in this adventure? While we appreciate sponsors that assign their employees to the project because they are too busy, this has seldom worked out well in the past. It is very important the person interacting with the team is personally invested in the project and really wants to see the end product.
3. Do I have a stable situation where I will be around to interact with the team for at least six months? If the project is related to your work, is it reasonable to assume you’ll be working there at least until the project is completed? If it is a personal project, is it reasonable to assume you’ll be around the area so you can interact with the team in person until the project is completed?

4. Are there other parties involved in the project? For instance, if you want an application that accesses a proprietary data source, have you already cleared this with the provider of the data source? If there is a particular hosting service you have in mind, have you worked the details out yet?

5. Are any legal issues that still need to be worked out (including legal issues within your own organization)? Are the intellectual property issues clear? If this is related to your work, have you discussed it with your legal department?