

Software Engineering Apprenticeship Program



University of Rhode Island
Department of Computer Science and Statistics

The SEA Program

The Software Engineering Apprenticeship is a unique program designed to provide URI Computer Science majors with the practical software engineering and development skills required by today's industries.

Under our curriculum requirements, undergraduates are expected to enroll in CSC 499, Project in Computer Science, in their junior or senior year. Students in this program work 15-20 hours per week for two semesters (or one semester and the summer) on a capstone project in computer science that will prepare them for careers in industry or for graduate study. Students can choose to do this work either with an industrial partner affiliated with the SEA Program or with a faculty member on campus.

The Partnership

The key element of the SEA Program is that it is a fully cooperative effort between the university and the participating industrial sponsors. The success of the program will require a sharing of responsibilities between the URI faculty, the sponsoring companies, and the student.

University Faculty. The faculty will represent the university in assuring that students enrolled in the SEA Program have a clear plan for an apprenticeship project that, upon successful completion, will meet the requirements for receiving academic credit. The faculty will also have final authority for determining satisfactory completion and grades. A designated faculty advisor will act as the point of contact to the industry sponsor for the duration of a student's apprenticeship

Industry Sponsor. The industrial partner will provide a professional, team-oriented environment where a student can contribute to an on-going project that utilizes software engineering skills. The sponsor will provide a direct supervisor who will guide the student's progress, and who will be a liaison with the designated faculty advisor. The supervisor will give timely feedback to both the student and the faculty advisor concerning the student's progress.

The Student. The student will perform and represent himself/herself and the university as a member of the computer technologies profession, contributing as a valued team member on a real-world software engineering project. The student will keep his/her industry supervisor informed of progress, and of any issues or difficulties arising during the apprenticeship.

SEA Operational Framework

Time frame and Eligibility. All computer science students are expected to enroll in CSC 499 for two consecutive semesters as part of the requirements for the B.S. in Computer Science, unless specifically exempted by a curriculum modification approved by the department. Students will first register for CSC 499 in the spring of their junior year, the summer following their junior year, or the fall of their senior year. Enrollment for the second semester is contingent upon satisfactory completion of the first semester's work.

Project Descriptions. Industry sponsors and university faculty members will submit short descriptions of the SEA projects that are currently appropriate for the program. These project descriptions will be available in the department for students to review. Each description of an industrial project should list the points of contact at both the sponsor's project site and a university faculty advisor. In the case of university projects, the sponsor and advisor will be the same individual.

Work Hours. Each semester, CSC 499 carries four university credits toward graduation. Accordingly, students in the program will be expected to work on their SEA project 15 to 20 hours per week during the academic year. Students should not work more than 20 total hours in one week when classes are in session and during the final examination period.

Compensation. The amount of compensation for industry sponsored SEA projects is to be negotiated by the student but will typically be \$10 - \$18 per hour with industry. Some students have worked for free for non-profits. University sponsored projects may or may not include compensation, depending upon the availability of funds.

Work at the Sponsor Site. Dress code, work hours, etc. will be clearly presented to a prospective student candidate at the outset of the apprenticeship.

Project Proposals. Using the project description as a basis, the student will develop a set of objectives and a statement of work acceptable to the student, the industrial sponsor, and the university faculty advisor. The proposal will serve as the standard agreement between the parties. A project proposal must be completed and approved before a student can register for CSC 499.

Project proposals should include the following:

- **Problem Description:** motivate the problem addressed in the proposed work
- **Statement of Work:** describe the actual tasks to be performed
- **Schedule:** provide a timetable for doing the work; include deliverables such as reports and presentations
- **Skills:** enumerate new skills to be learned; relate project work to skills acquired in URI courses

Reports. Students will submit monthly reports of their progress to their faculty advisor. In the case of an industrial project, the report will be approved and signed by the industrial sponsor prior to its submission to the university advisor. These reports will generally be two pages in length and will be due on the first working day of the month.

At the end of the first semester, the student will submit a more extensive report, generally 8-10 pages, to the faculty advisor. At the end of the second term, the student will submit a more extensive final report, generally 10-15 pages, and may also be asked to prepare an oral presentation of his/her work. This presentation may be given at either the sponsor's site or at the university.

Summer Employment. General guidelines for summer employment are 20 to 40 hours per week, \$10 to \$18 per hour. Please speak to Dr. Henry about other arrangements needed for summer credit in the SEA program.

Student Responsibilities

Software Engineering Apprenticeship Program

Overview

- Get placed on the mailing list.
- Find an internship.
- Write a proposal and get approval from URI CS SEA Coordinator .
- Register for CSC499 - Project in Computer Science.
- Attend weekly program meetings.
- Submit monthly progress reports to SEA Coordinator.
- Give two presentations to other program participants.
- At end of semester, submit a semester activity report.

As soon as possible

Email Lorraine [lorraine@cs.uri.edu] and ask to be put on the ugrad email list. We prefer you use your CS Dept account for this mailing list, but you should use an account that you check regularly.

Find an internship before semester begins. Suggested places to check:

- Providence Journal want ads.
- Computer Science Department Web Site [http://www.cs.uri.edu]
- Talk to CS Faculty for positions working with them directly
- Online at the BEACON; Go to [http://career.uri.edu] and click on BEACON
- Other online job sites (Monster, Hotjobs, etc)
- Direct contact by you to URI CS Partners

Arrange your own schedule with your Internship Sponsor (typically 15-20 hours per week).

Arrange your own compensation (this varies but typically is in the \$10-\$18/hr range and some, like research with a faculty member, may be unpaid).

Before the semester begins

Get initial approval from the URI CS SEA Coordinator (currently Dr. Henry) before accepting an internship position with your sponsor. (Final approval comes with the override form).

Submit a project proposal about two pages in length and include the following:

- Your name and contact information (email and phone numbers).
- The name of the company, department or agency for which you are working.
- Your supervisor's name, title and contact information (email and phone numbers).
- A clear description of the scope of work you will be doing for your internship.
- A signature and date from you and your supervisor.
- Job schedules, deliverables with due dates or specific other items for which you will be responsible.

The Coordinator will assign you a Faculty Advisor, which may be the Coordinator him/herself, or another CS faculty member. Students doing their internship directly on a Faculty member's research project will likely have that faculty member as their Faculty Advisor.

Take your project proposal, with your Faculty Advisor's signed approval, to the Coordinator. At this point, the Coordinator will sign an override form to allow you to register for CSC499, and indicating that you can accept the position with your sponsor. Take the override form to the URI Registrar and register for CSC499.

During Semester

There will be regular weekly meetings of the CSC499 students during the semester. This will be announced and coordinated through email. Please be ready to help determine this meeting time and to attend the meetings.

Submit monthly reports and an end of semester report to your Faculty Advisor and SEA Coordinator. Your reports are to be about two pages and should include the following information:

- Your name and contact information (email and phone numbers).
- The name of the company, department or agency for which you are working.
- Your supervisor's name, title and contact information (email and phone numbers).
- Give a clear description of what you have accomplished and learned in the past month.
- Include reflections on software engineering, software management, our CSC programs as they support or are deficient in helping you in your first job, team work, software development, tasks you completed, your satisfaction with your work, etc.
- Any comments on how we can improve the management of the internship program are appreciated and encouraged. Don't forget to mention the things that we are doing right too.
- A signature and date from you and your supervisor.

Every student gives a presentation to other students in the program each semester that you are registered for the course. For the first presentation you are required to talk about your internship. For the second presentation, you may choose to lead a discussion on a topic of general interest to interns, or you may again present about your internship.

Presentation Guidelines

If you need a laptop, web connection, or projector, please notify the Coordinator at least one week in advance.

Prepare a Keynote, Impress or PowerPoint presentation.

Embed web-based or computer based demo if appropriate.

Showing the product of your labors via screen shots and demos is informative, but you should also give the group a peek into the details of what you are doing. These should not be exhaustive details. Start with a high level overview and then peek into depth with one or a few examples. So if you are developing software, you might first mention the software and hardware you are using, show a high level system architecture diagram, and then think of one or two interesting problems you have solved and describe your solution with some detail.

Be sure to include some reflective material. You should mention such things as management and environment at work, pedagogy of this course, how this connects to your overall experience in our dept./university (or not).

Should you choose to lead a discussion on a topic of general interest to interns, you should clear the topic with the SEA Coordinator one week in advance of the discussion.

If appropriate, have the SEA Coordinator email the topic to the class in advance of the meeting time so that students can begin to think/read about the issue.

Come prepared with an introduction to the topic and a set of questions to motivate discussion.

Hand the SEA Coordinator the introduction outline and questions when you arrive.

Sample topics can include (but are not limited to)

- How to get a job
- How to improve our CSC program
- How to improve this class
- How to deal with particular issues in the workplace
- Invite your manager to speak to the class about a particular issue or invite career services to speak to the class about a particular issue (you will need to set up these visits and be sure to prepare with the visitor an outline or motivating paragraph in advance).

Prepare a short summary of the session and hand/e-mail to the SEA Coordinator the following week.