Industry Sponsored Professional Practice Program

Keith Moo-Young

Dean, College of Engineering, Computer Science, and Technology
California State University, Los Angeles

The purpose of this Professional Practice Program is to further establish the College of Engineering, Computer Science, and Technology (ECST) at California State University, Los Angeles (CSULA) as a recognized world class provider of professional practice experiences for its Engineering, and Computer Science students while enhancing our ability to recruit and retain the highest potential students. Outcomes achieved over the past two years include a sponsored Professional Practices Program, a sponsored Corporate Scholars Program and nine founding Strategic Corporate Partners committed to the program: The Aerospace Corporation, The Boeing Company, DirecTV, Heateflex, Los Alamos National Laboratory, Northrop Grumman Electronic Systems, Northrop Grumman Integrated Systems, Pratt & Whitney Rocketdyne, and Southern California Edison. In its second year, the college retained all nine founding partners and welcomed six new partners including: EmCycle, Medtronic MiniMed, Naval Surface Warfare Center Corona, Space Systems Loral, and Southern California Gas Company. Currently, we have four departments collaborating on senior design projects: Mechanical, Electrical, Computer Science, and Technology.

Professional Practice Program

The professional practice program provides seniors at California State University, Los Angeles with a capstone experience, in which students apply their theoretical knowledge to real applications. The current structure of the program exposes students to an industry setting, where students work with a real client (the company or industry partner) to develop a client-defined product. This product may be a physical prototype, software package, or operational algorithm. To ensure that students are exposed to a real world setting, the faculty prefers projects that require interdisciplinary student teams. Regardless of project type, student teams are expected to meet the needs of their client, and deliver a product at the end of the academic year. This means that work schedules and personal calendars must be managed in order to successfully complete all projects according to agreed-upon standards, putting the primary management responsibilities on the shoulders of student teams. All other faculty and staff exist to support team efforts, but these members of the senior design team will not be leading the project direction. In the end, the projects must be student driven.

Company/Industry partner

Companies are invited to contribute monetarily and commit approximately 100 hours of a technical manager's (company liaison) time in support of each senior design project. Funding supports any project related expenses that students and faculty will incur throughout the year. The company liaison defines a professional practice project and provides technical advice to the student design team throughout course sequence (September-June). The Liaison meets regularly with student teams, either in person or via video conference or teleconference, and guides students with respect to the desires of the company he or she represents. The Liaison is also present for main events, including design reviews, where the Liaison will provide feedback on work student teams have completed to ensure progress is in the most appropriate direction.

The results of the educational and training project are shared with the sponsoring company through presentations and reports which are college requirement for all students. To ensure that proposed projects meet the educational mission of the College, the Director of the Senior Design Faculty Director review, accept, and modify project descriptions in consultation the company liaison.

Faculty Director and Faculty Committee

To ensure the success of interdisciplinary projects, A Senior Design Faculty Director position was established at Cal State L.A. The director coordinates the instructional material between the departments and serves as the chair of the faculty committee. Committee members serve both as the primary advisors for their department but also help to select projects from companies. To achieve faculty buy in, each faculty

member on the committee is given both release time from teaching and a summer stipend to assist in the set up of the program for the following year. The director is given multiple course release time and an additional stipend during the summer.

Student Teams

The college currently has four departments participating in the professional practice program. Prior to the beginning of the program, all four departments will provide the professional practice program director with a roster of students. The faculty committee will review the list and assign student teams accordingly. Student design teams consist of students from one department or multiple departments depending on the needs of the project as defined by the liaison and the faculty committee.

Schedule

The schedule is constrained by the September – June academic calendar. The process starts at Senior Project Orientation Day in September. On this day, all industrial liaisons are invited to come to campus and to meet with their respective teams. The purpose of this meeting is to build rapport with the team, to present the problem in greater detail and to allow for discussion of the requirements and any constraints on the solution, to agree to the schedule for the first term including timing of weekly conference calls, and to provide background on the problem to bring the team up to speed.

The first deliverable expected from the student team is a work statement for the project. This includes the scope for the project and contains a clear statement of the project goal. This work statement is completed about five weeks into the project. After review, the sponsor may modify the work statement, but the purpose is to arrive at an agreed on project goal. The remaining three project phases (design-build-test) flow from the work statement. A design review is typically scheduled in December at the sponsor's site. Approval of the final design before holiday break allows for procurement of materials for the build phase that starts when classes resume after the break.

The remainder of the project consists of the build and test phases. The project culminates in a presentation of the project and the results on Projects Day, a celebratory event at the end of the academic year when all teams present their results. Students then are expected to make a final presentation at the sponsor's site and deliver the final report.

Results

During the first year, the college worked with nine founding strategic alliance sponsors, of the nine sponsors seven participated in the professional practice program and provided a design project. Out of the seven projects there were two interdisciplinary projects, and one joint project to Harvey Mudd College. Six of the projects were completed and a final product was provided to the sponsor. One project team did not complete the project, but provided the company with a comprehensive report of findings.

One of the major findings from year one was the fact that interdisciplinary teams are effective. The college underwent a major restructure of the curriculum to accommodate more inter-disciplinary projects.