A Proposal for a Self-Supporting Professional Graduate Degree Program in Engineering for the Master of Engineering Degree

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Executive Summary

Program description - The aim of this proposal is to establish a self-supporting professionally-oriented Master of Engineering program (MEng) at UCI. This degree program will be administered by the Samueli School of Engineering (SSoE). The Master of Engineering program’s goal is to train students in the foundation, skills and practices of engineering in different concentrations, and to instill in students skills that go beyond purely technical education, preparing them to become leaders, whether technical managers in large companies or entrepreneurs starting their own enterprises. It is anticipated that 80 students will be admitted to the inaugural cohort in Fall 2019, increasing to 360 in subsequent years as the program becomes self-sustaining. Initially the program will offer four concentrations in Civil, Mechanical, Electrical and Biomedical Engineering. Later, more concentrations can be added as the need arises. The program will be funded through tuition assessment. A market study has concluded that a tuition level of $42,000 is appropriate. The program will become self-sustaining in its second year of operation. A seed loan will be sought from campus to fund the degree establishment expenses and will be paid back once the program becomes self-sufficient. The program’s normative length is expected to be 3-4 quarters.

Program positioning - On the UCI campus, the MS programs in the Henry Samueli School of Engineering offer post graduate training geared primarily towards future researchers in different engineering disciplines. The Master of Engineering program is focused on preparing graduates for employment in industries such as electronics, aerospace, automotive, biomedical, manufacturing, robotics, security, defense, and construction.

Rather than having a research focus, the ME program will require students to acquire integrative knowledge of systems, as well as hands-on knowledge and experience in an applied domain through a capstone project. Additionally, the program will feature entrepreneurship and leadership training for its students that sharpens their workplace skills and provides basic knowledge of product conception, development and launch. The program will be primarily technical in focus and these courses are expected to comprise 25-33% of the curriculum units. By comparison, the existing MS in Engineering Management program (a program with Professional Degree
Supplemental Tuition (PDST) jointly managed by SSoE and Merage School of Business Management has a higher ratio of business related courses (50%) and is geared towards grooming students to become business managers with some level of technical knowhow.

Placement prospects and student demand - Program graduates will be able to seek employment in electronics, aerospace, automotive, biomedical, manufacturing, robotics, defense, and construction industries. Engineering disciplines are expected to remain popular for the foreseeable future with a current average job growth of 3-4% yearly region-wide and increasing into the next decade. A recent survey indicates that prospective students from CA, US, China and India would be extremely or strongly interested in applying and attending the UCI program once in place.

Funding - The Master of Engineering program will be self-supporting. The program revenue (including school charges and surplus) is projected to be about $10M/year and will provide funding for the following initiatives:

FTE Faculty: One third of the program revenue will be used to fund up to 18 regular ladder rank faculty FTE when it reaches its target of 360 students. Additionally, existing faculty will be compensated for: (1) teaching courses in this program either as buyout or stipend, (2) supervising students in project and case studies courses and (3) administrative duties related to the program. In addition, 4-6 full time lecturers will be hired to help teach some of the courses in this program (mainly entrepreneurship/leadership courses.)

Staff: Staff support will be provided by the SSoE staff and additional program staff hires (up to 6 staff FTE) funded from the tuition revenue. The program staff will provide day-to-day operational and administrative support including that for admissions, fellowships, appointments and general student affairs. The staff will also assist with the development of promotional and advertising materials to recruit students and with providing other administrative support.
Students: 33% of the revenue will be set aside for 2 or 3 year PhD fellowships supporting students in SSoE (with 1-2 additional year(s) funded by the prospective advisor). Additionally, the program anticipates hiring one teaching assistant for each course that is offered. It is estimated that up to 193-290 additional PhD students can be funded through this program. Finally, 10% of revenue will be set aside for financial aid of students in the self-supporting program. Part of this aid will target URM and female students.

UC Campuses and Other California Institutions with Similar Offerings - the Master of Engineering degree at UC Berkeley and the Master of Science in Engineering at UCLA are the two most similar programs to the proposed Master of Engineering at UCI. Both programs have sustained healthy growth and have student populations of about 250-350 students in each program. Prospective students surveyed in CA, US, India and China are likely to regard UCI’s program quality as comparable to other programs elsewhere.

Anticipated Campus Review and Implementation Dates - We anticipate submitting a proposal to campus committees in Winter 2018. If resources are in place, we anticipate developing the program and courses during the 2018-2019 academic year. Ideally, the program should admit its first cohort in Fall 2019 for the 2019-2020 academic year.
Section 1. Introduction

1.1 Aims and objectives of the program.

The Samueli School of Engineering (SSoE) is proposing a self-supporting Master Degree. Consistent with CCGA guidelines, this self-supporting program will be titled the Master of Engineering (MEng) Degree. The program will be managed by SSoE, and consisting of multiple specializations. The curriculum will include foundational courses that vary by specialization as well as an Entrepreneurial/Intrapreneurial sequence of courses that is common to all the specializations. The degree will have a strong experiential learning component embodied in a capstone project supervised by faculty members. The MEng program proposed here is developed, in part, to serve the needs of domestic and international students, and working professionals among whom the leaders of their respective specializations are especially likely to come.

The UC policy on self-supporting programs stipulates the many such programs meet one or more of the following four criteria: 1) primarily serve a non-traditional population, such as full-time employees, mid-career professionals, international students and/or students supported by their employers; 2) be offered through an alternative mode of delivery, such as online instruction or a hybrid model; 3) be alternatively scheduled, such as during evening, weekends, and summers; and/or 4) be offered in an alternative location (e.g., off-campus locations).

The case for the Master of Engineering to be self-supporting includes the

1. Non-Engineering Skills components:
2. Experiential learning:
3. Alternative Delivery:
4. Alternative Scheduling

These aspects will be elaborated upon in Section 3.6.

1.2 Historical development of the field and historical development of departmental strength in the field.

Founded as the School of Engineering in 1965 with just two faculty members and 75 students declaring engineering majors; the school today serves more than 4,500 students (3,598 undergraduates and 951 graduates) enrolled in 12 undergraduate degree majors and 13 graduate degree programs. The school was renamed The Henry Samueli School of Engineering in 1999 after Samueli, co-founder, chairman and chief technical officer of Broadcom Inc., made a generous donation.
Since the Fall of 2011, the Samueli School of Engineering achieved significant growth and expansion despite challenges posed by a major university budget shortfall. It has hired or replaced 32 faculty, added 58 staff and increased enrollment by 712 (529 undergraduates and 183 graduate students). The school also established new facilities, research initiatives and centers in several areas such as water, materials and manufacturing. A positive indicator of the growing stature of the school is the caliber of faculty we have successfully recruited and retained, especially midcareer and senior faculty. This shows that the Samueli School affords both the academic and lifestyle opportunities that are valued by high-performing faculty and encourages high expectations for the caliber of future faculty.

Faculty members are scholars and leaders in their disciplines and have achieved worldwide honors and recognition for their pioneering research and dedicated teaching. Nearly a third are fellows in professional societies, and 13 are members of the National Academy of Engineering. The school has nine endowed chairs, seven Distinguished Professors and four Chancellor’s Professors.

The school's emphasis on hands-on learning is attracting high-achieving students who want more than a classroom experience. This year’s class of incoming freshmen had the highest-ever average SAT score of 1,980 and an average GPA of 4.09. Thirty-nine percent are first-generation college students and 27 percent are from low-income families. This past year, the school granted 805 bachelor's degrees, 284 master's degrees and 87 doctorates.

Undergraduate and graduate student diversity is a key initiative for the Samueli School, with efforts to increase both underrepresented students and women. The school is actively involved in STEM outreach, from teacher training and a variety of K-12 programs to a collaboration with local community colleges.

Research is integral to the school’s mission to educate students and benefit society. Engineering faculty pursue investigations that are timely, socially responsible and forward thinking. They work in partnership with industry and state and federal agencies to promote the transfer of research to applications that improve lives. More than two-thirds of undergraduate students actively participate in faculty-led projects. Current research thrusts include communications and information technology, human health, energy and sustainability, and advanced manufacturing and materials.

![SSoE Graduate Programs Rankings (USNWR 2017)](chart)

**Figure 2. SSoE Graduate Programs Rankings (USNWR 2017)**
The Samueli School of Engineering is ranked 21st in U.S. News & World Report's current listing of best public engineering graduate schools. Its undergraduate program is ranked 27th among publics. Rankings are based on a survey of engineering deans and senior faculty at ABET-accredited programs in which a doctorate is the terminal degree. Several graduate programs in the School are ranked in the top 30 overall and top 20 among publics.

![Figure 3. SSoE Research Expenditures and Donor Support](image)

Private support from the community, alumni and corporations grew to $35.8 million in 2016-17. Gifts to the Samueli School help fund scholarships and fellowships for students, exciting research activities being conducted by faculty and graduate students, STEM outreach and critical academic programs. A generous $30 million Samueli Foundation gift toward the construction of a 180,000-square-foot interdisciplinary science and engineering building is a significant milestone in this effort. With the additional space, we will build upon our distinctive Anteater engineering experience to ensure all students have the knowledge, skills and leadership to tackle today’s global grand challenges.

### 1.3 Timetable for development of the program

The chart below quantifies our estimates for enrollment over the initial 5-year period. It is anticipated that 80 students will be admitted to the inaugural cohort in Fall 2019, increasing to 360 in subsequent years as the program becomes self-sustaining.

![Figure 4. Target Student Enrollment in the MEng Program](image)

We base our projections on two factors:
(1) **Marketing study of similar programs:** the two most closely matched programs are at UCLA and UC Berkeley. UCLA’s MS in Eng. Program has over 350 students. Berkeley’s MEng program had 254 students in 2015-2016. Factoring in growth over 10 year period our estimate of 360 students seems reasonable.

(2) **Survey of current students and applicants:** a significant percentage (over 80%) of surveyed applicants expressed good to strong interest in the program being proposed.

The timetable and milestones shown in Figure 5 are being considered for the MEng degree:

![Timeline and Milestones of the MEng Program](image)

**Figure 5. Timeline and Milestones of the MEng Program**

1.4 **Relation of the proposed program to existing programs on campus and to the Campus Academic Plan.**

The proposed MEng degree has been posted to the Campus’ 5 year perspective. There are currently no professional Master’s degree programs on campus in the engineering. The MECPS program, introduced in Fall 2017, is a joint Engineering-ICS SSPGDP focusing on Embedded and Cyber-physical Systems. By contrast, the proposed MEng program is an Engineering-centric program with a much broader scope.

The proposed program will complement our undergraduate degree offerings quite well. Graduates of our undergraduate programs are ideally suited to apply and enter the ME program. In recent years, we find that as these undergrads work on senior design projects they get familiar with many of the skills and integrative knowledge that culminate their undergraduate experience. Indeed, many of these students state that hands-on knowledge of systems is a highlight of their educational experience at UCI, and want to see more of it in the future. We feel that the MEng program directly addresses that point through the project students are required to do to fulfill their MEng graduation requirement.

The MEng program will also positively impact the state-supported graduate programs in the Samueli School. MS and PhD students will be recruited as TAs for the MEng program’s courses. Also, one third of the program’s net revenue will be allocated to recruit top PhD applicants by offering multi-year fellowships supplementing the current block allocations to the school. More details will be presented in Section 6.8.
1.5 Interrelationship of the program with other University of California institutions, if applicable.

Table 1. Engineering SSPGDPs at UC

<table>
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<tr>
<th>Program</th>
<th>Campus</th>
<th>Fee Type</th>
<th>Cost</th>
<th># Units</th>
<th>Cost</th>
<th>Online/On Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Computer Science</td>
<td>UCI</td>
<td>Program</td>
<td>43,000</td>
<td>44Q</td>
<td>43,000</td>
<td>On Campus</td>
</tr>
<tr>
<td>Master of Embedded/CPS</td>
<td>UCI</td>
<td>Program</td>
<td>30,000</td>
<td>36Q</td>
<td>30,000</td>
<td>On Campus</td>
</tr>
<tr>
<td>Master of Info. &amp; Data Science</td>
<td>UCB</td>
<td>Unit</td>
<td>2,302</td>
<td>27S</td>
<td>62,154</td>
<td>Online + immersion</td>
</tr>
<tr>
<td>MAS-Integrated Circuits</td>
<td>UCB</td>
<td>Unit</td>
<td>2,200</td>
<td>24S</td>
<td>52,800</td>
<td>Online, sync/async</td>
</tr>
<tr>
<td>Master of Engineering</td>
<td>UCB</td>
<td>Unit</td>
<td>2,200</td>
<td>25S</td>
<td>55,000</td>
<td>On Campus</td>
</tr>
<tr>
<td>MS in Engineering</td>
<td>UCLA</td>
<td>Course</td>
<td>3,850</td>
<td>36Q</td>
<td>34,650</td>
<td>Online</td>
</tr>
<tr>
<td>MAS-Data Science &amp; Engineering</td>
<td>UCSD</td>
<td>Unit</td>
<td>880</td>
<td>38Q</td>
<td>37,500</td>
<td>On Campus, part time, Weekends</td>
</tr>
<tr>
<td>MAS-Medical Device Engineering</td>
<td>UCSD</td>
<td>Unit</td>
<td>880</td>
<td>36Q</td>
<td>35,605</td>
<td></td>
</tr>
<tr>
<td>MAS-Wireless Embedded Systems</td>
<td>UCSD</td>
<td>Unit</td>
<td>880</td>
<td>36Q</td>
<td>35,605</td>
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Table 1 above lists the Engineering self-supporting degrees offered by various UC campuses. Most such degrees are specific to a particular concentration. The two best known, broad-based degrees similar to our proposed degree breadth are: (1) The Master of Engineering degree is a graduate program at UC Berkeley offered by the School of Engineering and (2) the MS in Engineering degree is an online degree program offered by UCLA’s SSoE. Feedback from both programs’ directors was sought and is included in Appendix 1: Letter of Support. Both directors were highly supportive of this proposed degree and highlighted the need for such programs across the UC system.

The Master of Engineering degree at UC Berkeley and the Master of Science in Engineering at UCLA are the two most similar programs to the proposed Master of Engineering at UCI. Both programs have sustained healthy growth and have student populations of about 250-350 students in each program. Prospective students surveyed in CA, US, India and China are likely to regard UCI’s program quality as comparable to other programs elsewhere.

![Overall Reputation Ratings: UCLA](image-url)

![Overall Reputation Ratings: Berkeley](image-url)

Figure 6. Surveyed students rated UCLA and UCB's SS Engineering Programs Highly

Potential students were surveyed (full report in Appendix 13: Market Research Report) about both programs. The results are shown in Figure 6). Overall, a greater percentage of respondents said that Berkeley’s program (53%) had
an “excellent” reputation compared to UCLA’s program (42%). It is noteworthy, however, that a greater percentage of respondents said UCLA’s program was either “excellent” or “very good” (89%), compared to Berkeley’s program (78%).

There were some notable differences by geography:

- US respondents rated Berkeley higher (47% “excellent”) than UCLA (30% “excellent”).
- This was especially true among respondents from California: they were more likely to rate Berkeley as “excellent” (55%) compared to UCLA’s program (38%)

Respondents were also asked to compare what are perceived to be competitive programs to a similar program that would be offered by the University of California Irvine (UCI).

As Figure 7 illustrates, more than 4 in 5 respondents (81%) believe that a UCI Master of Engineering professional degree program would be either “much better” (42%) or “somewhat better” (39%) than a competitive program in terms of quality. International respondents (83%) are more likely than US respondents (78%) to say that the UCI program would be of higher quality than programs they are familiar with. Respondents from states other than California are more likely to believe that a UCI program would be of higher quality compared to programs they are familiar with. Non-California residents: 94% say UCI of higher quality (47% much higher, 47% somewhat higher). California residents: 78% say UCI of higher quality (28% much higher, 39% somewhat higher).

![Figure 7. Assessing Prospective Students' Opinion of a Potential MEng Program at UCI Compared to Other Programs Elsewhere](image)

1.6 Department or group which will administer the program.

Oversight

The Master of Engineering will be administered by the Associate Dean of Graduate and Professional Programs at UCI’s SSoE. Each specialization will have a Program Director who administers the specific aspects of the specialization on behalf of its faculty, and will report to the Associate Dean. It will be overseen by an executive committee which
reports to the Dean. The executive committee will discuss annually any proposed changes to the ME degree. It will also report to and seek guidance from the SSoE faculty. The operations of the degree program will be managed by the Graduate Student Affairs Office coordinating with the individual departments. The Program's bylaws (Appendix A) provide additional details on the program’s procedure for selecting the executive committee as well as other procedures related to the management of the degree program.

Student Advising

The program director will assign an advisor to all incoming students based on their areas of interest and after consultation with key faculty members. The aim in assigning advisors to students will be to make the best match possible so students can fully benefit from their educational experience at UCI.

Staff Support

Staff support will be provided by the SSoE staff which will be funded by program revenue. This will include staff hired exclusively for the program as well as fractional FTEs partially allocated to the program. The staff will provide day-to-day operational and administrative support including that for admissions, fellowships, appointments and general student affairs. The staff will also assist with the development of promotional and advertising materials to recruit students and with providing other administrative support.

1.7 Plan for evaluation of the program within the offering departments(s), by the Academic Senate and campus wide.

Initial Assessment

In order to assess the achievement of the target objectives, we will establish milestones for each of the three years. The following milestones are being considered for the MEng degree:

1. 2017-2018: Campus review and approval completed.
2. Summer 2018: start developing courses for first year offering.
5. Fall 2020: Admit second cohort – Target 120 students.

At the end of each year, the executive committee (whose formation and function is described in the bylaws, Appendix 9) will gauge whether relevant milestones have been reached. These findings will be reported to the graduate division as well as the participating schools.

Recurring Assessment(s)

Graduate programs are formally reviewed every ten years at UCI. This includes an external review by a panel of nationally recognized scholars and an internal review by the Graduate Council. Information on APRB is available at http://senate.uci.edu/committees/boards/academic-program-review-board-aprb/.
Section 2. Program

The self-supporting Master’s Degree in Engineering (MEng) consists of six concentrations electives specific to each concentration, plus 1-2 project courses leading to a final project. In addition, a common layer of three courses in Business/communication/Leadership will be required of all the specializations. Courses will carry 4 units of instruction each and will be either developed specifically for this program or existing courses that will be delivered in a blended format or a separate section. The courses comprising the degree will be a mix of on-ground and online components. To begin the program, all courses will require a residential component. In the future, we will consider the possibility of having some courses in a blended or online format if deemed pedagogically sound. The blending format will vary from course to course and concentration to concentration depending on the amount of foundational versus hands-on components in each course. Ideally, much of the foundational knowledge will be delivered online while hands-on sessions will be face-to-face. Depending on the class size, some of the face-to-face sessions may be held using group interaction systems such as Google hangout.

Students can apply to the program from anywhere and can be domestic or international. It is recommended for early to mid-career professionals or new graduates wishing to expand their expertise into advanced levels. Based on current trends, we anticipate having about 80 students at the start, then ramping up to over 360 over 8 years.

2.1 Undergraduate preparation for admission.

Potential graduate students for the MEng Program will apply via the Graduate Division’s online application and indicate on their applications their interest in the Program. Students will apply directly to the concentration of their choice. Applicants are expected to hold a Bachelor’s degree in an Engineering or Computer Science Discipline. Students from other disciplines may be considered for admission if they have sufficient background in the basics of their target specialization. Applicants will be evaluated on the basis of their prior academic record and their potential for carrying out graduate level work as demonstrated in submitted application materials. These materials will include official university transcripts, letters of recommendation, GRE scores, and a Statement of Purpose where students can explain their relevant experience (academic or industry). Students with industry experience will be considered favorably, especially if their experience is relevant to the areas emphasized by their target specialization. An admissions committee composed of senate faculty members will evaluate the applicant files and make admissions decisions based on the overall file presented by the student. Overall, students will be admitted using criteria similar to those used in traditional MS degrees from relevant departments.

The admissions process will be conducted in accordance with the university rules and criteria for admission, and will be similar to the one applied for regular MS degree programs in SSoE. This includes among others- the minimum TOEFL requirements set forth by the Graduate Division. Whenever possible and appropriate, the program staff will conduct in-person or remote (e.g. Skype) interviews with prospective applicants to further gauge their English proficiency. Given its nature emphasizing hands-on system design, the program will target especially those students whose training is more oriented as such. Industry interest in such training is reflected in the letters of support attached to the proposal.
2.2 Foreign language.
There are no formal foreign language requirements for the proposed degree program. Engineering is an area where English is the predominant language of technology. Thus we do not anticipate a foreign language requirement formally, but practically this is much less of an issue as over 80% of our applicant pool are international students.

2.3 Program of study: Master of Engineering

![Diagram of MEng program concentrations and specializations]

**Figure 8. MEng program concentrations (in blue) and specializations (in green)**

**a) Specific fields of emphasis:** Engineering, with concentrations in: Electrical Engineering and Computer Science, Mechanical and Aerospace Engineering, Biomedical Engineering and Civil and Environmental Engineering.

**b) Plan(s):** The Master degree in Engineering is a plan II program requiring a project by the students.

**c) Unit requirements:** 40 units.

**d) Required and recommended courses, including teaching requirement:** Please see plan of study below.

**Required:** 3 Entrepreneurship/Intrapreneurship courses, ENG 281AP, ENG 281BP, and ENG 281CP.

**Required:** 6 technical courses. Acceptable courses are listed for each concentration/specialization.

- **EECS Concentration:** Has two specializations:
  - Digital and Image Signal Processing
    - Three core courses are required: EECS 250P (Digital Signal Processing I); EECS 213P (Computer Architecture); and EECS 220P (Advanced DSP Architecture and Design)
    - Select three additional courses from the following list of electives: EECS 202BP, EECS 211P, EECS 215P, EECS 217P, EECS 223P, EECS 240P, EECS 241AP or EECS 203AP
  - High Speed Communication Circuits and Systems
Four core courses are required: EECS 241AP, EECS 244P, EECS 270AP and EECS 285AP
- Select two additional courses from the following list of electives: EECS 250P, EECS 240P, EECS 241BP, EECS 270BP, EECS 270DP, EECS 280AP or EECS 280CP

- CEE concentration: Has two specializations:
  - Water & Energy Nexus: Choose six courses from the following: CEE 263P, CEE 265P, CEE 260P, CEE 264P, CEE 218P, and PP&D 139P.


- MAE Concentration: Has two specializations:
  - Nanotechnology Specialization: Choose six courses form the following: MAE 247P, MAE 252P, MAE 259P, MAE 254P, MAE 257P and MAE 229P

e) Capstone Course

Required: Project Course (ENG 210P). (8 Units, can be taken in one or two quarters) Students are required to complete a project that deals with a specific emphasis of their concentration/specialization. The project will be mentored by a faculty member and approved by the student’s advisor and the Concentration director. A project report must be submitted in partial fulfillment of the degree requirements. The project report needs to be approved by the mentor, the student’s advisor and the director of the MEng Program.

f) When a degree program must have licensing or certification, the requirements of the agency or agencies involved should be listed in the proposal, especially the courses needed to satisfy such requirements (CCGA Minutes, 1/17/78, p.5): N/A

2.4 Field examinations – written and/or oral.
Not required.

2.5 Qualifying examinations – written and/or oral.
Not required

2.6 Thesis and/or dissertation.
None required.

2.7 Final examination.
None required.

2.8 Explanation of special requirements over and above Graduate Division minimum requirements.
No special requirements.
2.9 **Relationship of master’s and doctor’s programs.**
Not applicable.

2.10 **Special preparation for careers in teaching.**
No special requirements or preparation are needed.

2.11 **Sample program.**

![Diagram of a one-year sample program]

**Figure 9. One year sample program**

2.12 **Normative time from matriculation to degree.**
Figure 9 shows a one-year plan of study. Completion of all requirements for the Master of Engineering is possible in 1 year. With proper preparation and background, normative time is 1 year. The maximum time for the degree is 2 years.

**Section 3. Projected need**

3.1 **Student demand for the program.**
Initially the program will draw students from the large applicant pool of current MS programs as the main program. Historically about 2500-3200 students apply to SSoE’s MS programs. Of these applicants 600-700 are admitted to the MS programs. Thus it is clear that there is significant demand for graduate programs in Engineering and there exists an excellent pool of applicants to which this program can be marketed. We will specifically seek out those applicants who have some industry exposure (whether as working professionals or interns, or having done practical work in their undergraduate years). Additionally, the degree will be marketed to local industry through our affiliates and contacts. Furthermore, the popularity of such professional programs both within UC, CA, the US and internationally. Within the UC system, professional Master programs at UCLA, UC Berkeley and other campuses are quite popular, attracting 250-400 students in each program.
A survey was conducted by the Division of Continuing Education (formerly University Extension) to gauge the awareness of, interest in, and features desirable in a professional Master’s program in Engineering. Additionally, the survey sought to assess the reaction of the surveyed to the target tuition cost of $42,000. The online survey received input from 104 respondents from a demographically/geographically-balanced global panel of over 250,000 who:

- All received B.S. degrees in Eng. in past 15 years or expect to by 2019 distributed as follows:
  - earned a B.S. degree in Engineering with the last 15 years—57
  - currently studying for a B.S. Engineering degree and expecting to graduate by the Summer of 2019—47

- Had their undergraduate degrees in Aerospace; Biomedical; Civil; Computer; Electrical; Environmental; Materials Science; Mechanical; and Nanotechnology, and are geographically distributed as follows:
  - US—54 (29 California and 25 representative sample from other states)
  - International—50 (India 24, China 26)

Figure 10, Figure 11, and Figure 12 show the survey results with regards to the level of interest in the MEng program. It clearly shows that there is significant interest in such a degree that is consistent across all the geographical regions with 76% showing very high or extreme interest. 73-88% indicated that they will attend if accepted and 65-83% indicated that they will apply to the program.

The complete survey results are in Appendix 13: Market Research Report.

**Interest Level in the Program: US vs. International**

*Based on the description above, how interested are you in the Master of Engineering professional degree program offered by UC Irvine?*

![Interest Level in the Program](image)

**Figure 10. Interest Level in the MEng Program - US and International**
Interest Level in The Program: By Region

Based on the description above, how interested are you in the Master of Engineering professional degree program offered by UC Irvine?

![Interest Level in the MEng Program by region](image)

**Figure 11. Interest Level in the MEng Program by region**

Interest in Applying/Attending

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>How likely are you to apply to this program?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CA</td>
</tr>
<tr>
<td>Extremely likely</td>
<td>17%</td>
</tr>
<tr>
<td>Very likely</td>
<td>48%</td>
</tr>
<tr>
<td>Somewhat likely</td>
<td>24%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>How likely are you to attend this program if accepted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CA</td>
</tr>
<tr>
<td>Extremely likely</td>
<td>28%</td>
</tr>
<tr>
<td>Very likely</td>
<td>45%</td>
</tr>
<tr>
<td>Somewhat likely</td>
<td>24%</td>
</tr>
</tbody>
</table>

**Figure 12. Likelihood of Applying to the MEng Program and to Attend if Accepted**
3.2 Opportunities for placement of graduates.

Figure 13. Projected Demand for Engineering Jobs (Data Provided by EMSI - http://www.economicmodeling.com/)

Engineering disciplines are expected to remain popular for the foreseeable future with a current average job growth of 3-5% yearly region-wide and increasing into the next decade (Figure 13). In comparison to the national unemployment rate of 4.7%, only 2.6% of engineers are unemployed. By 2024 there will be a need for around 1.7M new engineering jobs (Figure 15), earning on average near 6 figure salaries (Figure 14).

Figure 14. Median annual wages in 2015 and projected 2014–24 employment change engineering occupations. Bubble size represents projected 2024 employment [8].
We expect students to have an integrative knowledge of their targeted specialization. Students will also acquire hands-on knowledge through practical projects in a targeted application domain. Depending on their target concentration, program graduates will be able to seek employment in electronics, aerospace, automotive, biomedical, manufacturing, robotics, defense, and construction industries. Given the large number of applicants to the Engineering graduate MS programs, and the limited capacity to accommodate them in these programs, the MEng program could initially draw from applicants to SSoE’s MS programs. Specifically, we will target students who are interested in experiential and hands-on education, and who articulated that interest in their statement of purpose. Subsequently, students will be able to apply directly to the program. Worldwide, there is also a boom in demand for graduates with engineering skills. Given that students in the MEng program will be a mix of domestic and international, the, graduates MEng program may choose to pursue employment or startup opportunities domestically or globally.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Projected employment percent change, 2014–24</th>
<th>Median annual wage, 2015</th>
<th>Projected employment in 2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace engineers</td>
<td>-2.30%</td>
<td>$107,830</td>
<td>70,800</td>
</tr>
<tr>
<td>Agricultural engineers</td>
<td>4.4</td>
<td>75,090</td>
<td>3,000</td>
</tr>
<tr>
<td>Biomedical engineers</td>
<td>23.1</td>
<td>86,220</td>
<td>27,200</td>
</tr>
<tr>
<td>Chemical engineers</td>
<td>1.8</td>
<td>97,360</td>
<td>34,900</td>
</tr>
<tr>
<td>Civil engineers</td>
<td>8.4</td>
<td>82,220</td>
<td>305,000</td>
</tr>
<tr>
<td>Computer hardware engineers</td>
<td>3.1</td>
<td>111,730</td>
<td>80,100</td>
</tr>
<tr>
<td>Electrical engineers</td>
<td>1</td>
<td>93,010</td>
<td>180,200</td>
</tr>
<tr>
<td>Electronics engineers, except computer</td>
<td>-1.4</td>
<td>98,270</td>
<td>135,500</td>
</tr>
<tr>
<td>Environmental engineers</td>
<td>12.4</td>
<td>84,560</td>
<td>62,000</td>
</tr>
<tr>
<td>Health &amp; safety engineers, except mining</td>
<td>6.2</td>
<td>84,600</td>
<td>26,800</td>
</tr>
<tr>
<td>Industrial engineers</td>
<td>0.9</td>
<td>83,470</td>
<td>243,200</td>
</tr>
<tr>
<td>Marine engineers and naval architects</td>
<td>8.9</td>
<td>93,110</td>
<td>9,000</td>
</tr>
<tr>
<td>Materials engineers</td>
<td>1.3</td>
<td>91,310</td>
<td>25,600</td>
</tr>
<tr>
<td>Mechanical engineers</td>
<td>5.3</td>
<td>83,590</td>
<td>292,100</td>
</tr>
<tr>
<td>Mining &amp; geological engineers</td>
<td>6.4</td>
<td>94,040</td>
<td>8,800</td>
</tr>
<tr>
<td>Nuclear engineers</td>
<td>-4</td>
<td>102,950</td>
<td>16,200</td>
</tr>
<tr>
<td>Petroleum engineers</td>
<td>9.8</td>
<td>129,990</td>
<td>38,500</td>
</tr>
<tr>
<td>Engineers, all other</td>
<td>4</td>
<td>95,900</td>
<td>142,300</td>
</tr>
<tr>
<td></td>
<td>5.1</td>
<td>$94,181</td>
<td>1,701,200</td>
</tr>
</tbody>
</table>

*Figure 15. Projected Engineering Employment in 2024, by Field [9].*
3.3 Importance to the discipline.

As shown in Figure 16, there is a steady annual growth of 7% in the demand for Master level education across all engineering disciplines. In comparison with the number of annual PhD graduates, it is clear that the vast majority of the Masters graduates end up working outside of academia, and usually in industry. In today’s competitive world, the added skills acquired by Masters graduates positions them better for the higher paying jobs. Indeed, a recent article by USNWR it [10] points out that the number of credits needed for a bachelor’s degree has been declining (from 150 a century ago to 120 today), while the target areas are becoming more complex and require more study to meet the increasing requirements for successful engineers. Industry veterans support these claims. “Young engineers "don’t have the depth of knowledge we really need," argues Brad Aldrich, a water resource engineer and president of Aldrich + Elliott, PC, of Essex Junction, Vt. Former Lockheed Martin Chairman and CEO Norman Augustine is also quoted as saying: “It’s in the public’s interest that we make the master’s degree the basic degree" of the profession.” While we are not advocating the transformational step of changing the US engineering educational system at this time, we note, again quoting the article, that, “a 2011 report from the Georgetown University Center on Education and the Workforce [11] put engineers’ median salary at $75,000 with a bachelor’s, versus $99,000 with a master’s.” Furthermore, the same study concluded that the average lifetime earnings of engineers with Master’s or higher degrees is $400K-$700K more than those with a Bachelor’s degrees (Figure 17). Thus, from a return-on-investment point of view, a graduate degree is worthwhile.

Figure 16. Nationwide Engineering Degrees Awarded (Source: [1])
3.4 Ways in which the program will meet the needs of society.

The impact of engineering on society is hard to underestimate. While buildings, roads, factories, cars, consumer goods, and other engineered systems have been developing since the industrial revolution, we are making those systems smarter and relegating more of our decision making to such systems. Today it is hard to imagine a moment in as person’s life on this planet where he or she is not interacting with such a system. From the smart grid that powers homes, to medical and health care monitoring systems, to electric vehicles and automotive telematics, to civil infrastructure, emergency response systems, and manufacturing, the need for experiential skill sets to help design, maintain, improve, use and assess such systems is an indispensable component in society’s quest for a safer, more dependable, comfortable and generally happier status.

A recent (2016) study by PayScale [12] surveyed different professionals about their overall level of happiness, derived from a set of KPIs. The results are summarized in Figure 18. Overall, Engineers achieve average levels of non-material KPIs (meaning, stress, satisfaction) while being very competitive in terms of material KPIs (early and mid-career pay). Thus, it appears that Engineering provides a good overall return on investment (personal, time, and financial) compared with other professions.
Figure 18. Comparing Different Professions at the Personal Level (2016 PayScale Study [12])

3.5 **Relationship of the program to research and/or professional interests of the faculty.**
This is a general, multi-concentration program whose scope aligns with faculty in four departments in SSoE. Within each of the concentrations, the faculty participants are top researchers in their respective domains. Most of our faculty’s research has a moderate to strong experiential component, making them well positioned to pass on their expert knowledge to the program participants. Furthermore, the industry involvement in this program, both as advisory and feeder/consumer of the program’s graduates will become a catalyst for interactions at the research level through identifying, funding and solving research problems of common interest between SSoE faculty and industry.

3.6 **Program Differentiation.**
As mentioned before, the case for the MEng degree as a self-supporting professional graduate degree program is based on the following four differentiating factors:
1. **Non-Engineering Skills components**: According to a recent article by Forbes [13], the top two skills employers say Millennials need are: (1) Attention and follow through, and (2) more than college. Let’s elaborate: “...“very few” entry-level candidates have work experience on projects or internships that have allowed them to “own and execute on a deliverable from beginning to end” – a must-have skill...” This clearly points to experiential learning, and project experience. (2) “...With college enrollments higher than they’ve ever been, bachelor’s degrees may now be less important in part because they’re less rare. College education isn’t the simple recruiting filter it used to be....” While universities prepare students well for academia, memorizing, position writing and the sciences, Badger Maps CEO Steve Benson believes that “our education system has effectively failed them in terms of preparing them for careers in business... recent grads who pursue business feel unprepared and out of place, says Benson. “It’s almost like we spent 20 years teaching them track and field events and now that they’re ‘grown up’, we toss them in the deep end of a pool and ask them to swim.” An Article in the balance [14] lists communication skills, leadership and teamwork as central skills for engineers. Same in another article by Business news daily [15].

2. **Experiential learning**: The program is focused on preparing graduates for employment in industries such as electronics, aerospace, automotive, biomedical, manufacturing, robotics, security, defense, and construction. Rather than having a research focus, the program will require students to acquire integrative knowledge of systems, as well as hands-on knowledge and experience in an applied domain through a capstone project. Thus, UC policy criteria 1) and 2) above are met by the proposed program.

3. **Alternative Delivery**: The courses will be initially developed for in-class delivery with online content supplementing in-class material. All courses in the program will make use of online technologies (such as online lectures) and some hands-on lab components will be performed using online virtual laboratories. The program plans to hold some courses online, although all courses (for now) will require a residential component. This is motivated by two factors: (1) the need to gain additional experience with the curriculum as a whole in order to plan a well-tempered educational flow across courses and (2) the development of online laboratory components that could in the future be an appropriate substitute to the hands-on, in-person labs currently contemplated in the planned curriculum. The online availability of lectures and other course material will make it easier for industry professionals to enroll in the degree program and catch up on course material should they miss lectures due to work-related obligations. As the program evolves, we hope to move to an online degree. We will use a portion of the projected surplus to fund the task of “onlining” the curriculum over time. We may also seek a partnership with University Extension who has extensive experience in developing online courses.

4. **Alternative Scheduling**: Another attraction for this program is the flexibility in scheduling course offerings. As the need arises, we will offer multiple sections of a given course, and some sections could be offered outside of normative time and even possibly on weekends. We expect this to help reduce pressure on classroom usage and also help accommodate working professionals. This option will be particularly relevant for the entrepreneurship/intrapreneurship course sequence as multiple sections will be expected to be held given that it is a degree-wide requirement.

From a broader perspective, the MEng degree is differentiated from other traditional degrees as shown in Figure 19. We compare MEng to: (1) MS degree in an engineering concentration, (2) the MS degree in Engineering Management offered by SSoE and (3) an MBA degree. The metrics used in comparison were primarily identified as the most important considerations by those surveyed in the market study, and are ranked in Table 2:
A. Affordability (i.e. cost)
B. Time efficiency (i.e. amount of time spent in the program)
C. Technical content (% of technical engineering courses in the curriculum)
D. Experiential learning (how important are hands-on projects in the curriculum)
E. Business content (% of business-related courses in the curriculum)
F. Communication skills (how much emphasis on communication skills in the curriculum)

Table 2. Most important considerations for potential MEng applicants

<table>
<thead>
<tr>
<th>Facts</th>
<th>All</th>
<th>US</th>
<th>CA</th>
<th>Rest</th>
<th>Intl.</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student will acquire hands-on knowledge through practical projects.</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Students will enhance their technical training in their area of specialization.</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>It is a professional program designed to meet growing need for practiced Engineers.</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Programs offers multiple tracks that correspond to different areas in Engineering.</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Program offers leadership training designed to help graduates increase productivity</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

Figure 19. Comparing the different types of Master's degrees
Figure 19 shows as a radar diagram the comparison of the four degrees (MS, MSEM, MBA and MEng). Rather than having a research focus, the MEng program will require students to acquire integrative knowledge of systems, as well as hands-on knowledge and experience in an applied domain through a capstone project. Additionally, the program will feature entrepreneurship and leadership training for its students that sharpens their workplace skills and provides basic knowledge of product conception, development and launch. The program will be primarily technical in focus and these courses are expected to comprise 25-33% of the curriculum units. By comparison, the existing MS in Engineering Management program (jointly managed by SSoE and Merage School of Business Management) has a higher ratio of business related courses (50%) and is geared towards grooming students to become business managers with some level of technical knowhow.

Another key differentiator in the MEng degree is the modality of course content delivery. All the courses in the program will make use of online technologies in different ways depending on the particular course content. A full-time technical staff person will be dedicated to assisting instructors in managing the technology aspect of their courses. All the classroom course lectures and discussions will be professionally recorded and added to the course website in different modes including large and small video as well as podcasts. Whenever possible the lectures will also be closed captioned for students to watch without the need of a headphone or sound, and to enable video content search. In addition, several online tools will be made available to instructors such as the piazza tools as well as Google Hangout to mention but a few. Some hands-on lab components will also be performed using online virtual laboratories from providers such as National Instruments’ Labview and Modelica.

While all the courses will be technologically enhanced as above, the courses will still involve face-to-face interaction in the classroom and the labs. Additionally, the assessment process will be similar to that of traditional courses. The online availability of lectures and other course material will make it easier for industry professionals to enroll in the degree program and catch up on course material should they miss lectures due to work-related obligations.

### Section 4. Faculty

The proposed MEng program will be governed by the core group of faculty named in Table 3 below. These faculty will comprise the concentration and specialization directors. In addition, the Samueli School of Engineering Faculty will be teaching the program courses, either as part of their regular teaching load or as an overload. Each department’s faculty (MAE, EECS, BME and CEE) have voted in support of the program and the voting results are reported in Appendix 4. The faculty vitae are included in Appendix 5.

Only the core faculty vitae are included. The bios of the SSoE faculty are available on the web ([http://www.eng.uci.edu](http://www.eng.uci.edu)). In addition to the faculty members listed here, several full-time lecturer will be hired to help administer and teach courses in this program.
Table 3. MEng Core Faculty

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Rank¹</th>
<th>Type²</th>
<th>FT or PT³</th>
<th>Highest Degree Earned And Field</th>
<th>Institution from which Highest Degree Earned &amp; Year</th>
<th>Course/area Responsibility</th>
<th>Years of Experience (as of July 1, 2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozdal Boyraz</td>
<td>ASC</td>
<td>T</td>
<td>FT</td>
<td>Ph.D., EE</td>
<td>University of Michigan, 2001</td>
<td>EECS/High Speed Communications</td>
<td>4</td>
</tr>
<tr>
<td>Lee Swindlehurst</td>
<td>P</td>
<td>T</td>
<td>FT</td>
<td>Ph.D., EE</td>
<td>Stanford University 1987</td>
<td>EECS/Signal and Image Processing</td>
<td>5</td>
</tr>
<tr>
<td>Farzin Zaerian</td>
<td>ASC</td>
<td>T</td>
<td>FT</td>
<td>Ph.D., Structural Engineering</td>
<td>Stanford University 2006</td>
<td>CEE/Structural</td>
<td>6</td>
</tr>
<tr>
<td>Farzad Naemi</td>
<td>A</td>
<td>NTT</td>
<td>PT</td>
<td>Ph.D., Structural Engineering</td>
<td>University of Southern California, 1982</td>
<td>CEE/Structural</td>
<td>33</td>
</tr>
<tr>
<td>Michelle Digman</td>
<td>ASC</td>
<td>T</td>
<td>FT</td>
<td>Ph.D., Chemistry</td>
<td>University of Illinois at Chicago, 2003</td>
<td>BME</td>
<td>0</td>
</tr>
<tr>
<td>Diego Rosso</td>
<td>ASC</td>
<td>T</td>
<td>FT</td>
<td>Ph.D., EnE</td>
<td>University of California, Los Angeles, 2005</td>
<td>CEE/WEX</td>
<td>11</td>
</tr>
<tr>
<td>Kenneth Mease</td>
<td>P</td>
<td>T</td>
<td>FT</td>
<td>Ph.D., Biomedical Engineering</td>
<td>University of Southern California, 1980</td>
<td>MAE</td>
<td>7</td>
</tr>
</tbody>
</table>

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. Updated information is to be provided at the time of the visit.

1. Code: P = Professor    ASC = Associate Professor   AST = Assistant Professor   I = Instructor   A = Adjunct   O = Other
   2. Code: T = Tenured    TT = Tenure Track    NTT = Non Tenure Track
   3. Code: FT = Full-time    PT = Part-time    Appointment at the institution.
   4. The level of activity (high, medium or low) should reflect an average over the year prior to the visit plus the two previous years.

Section 5. Courses

The courses below will be proposed as part of the degree program. While many of the courses will be developed specifically for the program, other courses will be similar in content to existing courses, but offered in separate sections alternatively scheduled or delivered. Across the whole curriculum, there will be more emphasis on hand-one experiential learning leading to the Capstone project.
General Courses
- ENG 210P MEng Capstone Project (8)
- ENG 281AP Entrepreneurship Science & Engineering: Innovate (4)
- ENG 281BP Entrepreneurship Science & Engineering: Build (4)
- ENG 281CP Entrepreneurship Science & Engineering: Launch (4)

BME Concentration Courses
- BME 210P Molecular and Cellular Engineering (4)
- BME 220P Sensory Motor Systems (4)
- BME 295P Nanotechnology for Biomedicine (4)
- BME 211P Microscale Tissue Engineering (4)
- BME 221P Quantitative Physiology: Organ Transport Systems (4)
- BME 233P Dynamic Systems in Biology and Medicine (4)
- BME 238P Spectroscopy and Imaging of Biological Systems (4)
- BME 251P Engineering Medical Optics (4)
- BME 260P Microfluidics and Lab-on-a-Chip (4)
- BME 295P Molecular and Cell Biophotonics (4)
- BME 295P Cardiovascular Device Technologies (4)
- BME 295P Ophthalmology Biomedical Engineering (4)
- BME 212P Cardiovascular Tissue Engineering (4)
- BME 234P Neuroimaging Data Analysis (4)
- BME 240P Introduction to Clinical Medicine for Biomedical Engineering (4)
- BME 262P Microimplants (4)
- BME 295P Bio-spectroscopy (4)
- BME 295P Neural Time Series (4)
- BME 295P Coding in the Brain (4)

CEE Concentration Courses
- CEE 249P Earthquake Engineering (4)
- CEE 290P Structural Engineering for Wind and Hurricane Forces (4)
- CEE 291P Performance-Based Structural Engineering (PBSE) (4)
- CEE 292P Ductile Design of Steel Structures (4)
- CEE 293P Ductile Design of Concrete Structures (4)
- CEE 231P Advanced Foundation Engineering (4)
- CEE 259P Advanced Structural Analysis (4)
- CEE 294P Nonlinear Structural Analysis (4)
- CEE 295P Seismic Design of Structures with Protective Systems (4)
- CEE 296P Ocean and Coastal Structural Engineering (4)
- CEE 297P State of the Art in Structural Engineering (4)
- CEE 263P Advanced Biological Wastewater Treatment Process (4)
- CEE 265P Physical-Chemical Water Treatment Processes (4)
- CEE 260P Desalination Engineering (4)
- CEE 264P Carbon and Energy Footprint Analysis of Water System (4)
- CEE 218P Sustainable Energy Systems (4)
• PP&D 139P Water Reuse Practices and Policy (4)

**EECS Concentration Courses**
- EECS 250P Digital Signal Processing I (4)
- EECS 213P Computer Architecture (4)
- EECS 220P Advanced DSP Architecture (4)
- EECS 202BP Techniques in Medical Imaging (4)
- EECS 211P Design and Analysis of Algorithms (4)
- EECS 217P VLSI Systems Design (4)
- EECS 223P Real-Time Computer Systems (4)
- EECS 240P Random Processes (4)
- EECS 241AP Digital Communications I (4)
- EECS 244P Wireless Communications (4)
- EECS 270AP Advanced Analog IC Design (4)
- EECS 285AP Optical Fiber Communications (4)
- EECS 270BP Advanced Analog IC Design (4)
- EECS 270DP RF IC Design (4)
- EECS 280AP Advanced Electromagnetics (4)
- EECS 280CP RF Antenna Design (4)
- EECS 203AP Digital Image Processing (4)

**MAE Concentration Courses**
- MAE 217P Generalized Thermodynamics (4)
- MAE 210P Advanced Fundamentals of Combustion (4)
- MAE 212P Engineering Electrochemistry: Fundamentals and Applications (4)
- MAE 214AP Fuel Cell Fundamentals and Technology (4)
- MAE 218P Sustainable Energy (4)
- MAE 211P Energy Storage Systems & Technology (4)
- MAE 213P Energy Efficiency Technology (4)
- MAE 247P Micro-System Design (4)
- MAE 252P Fundamentals of Microfabrication (4)
- MAE 259P Mechanical Behavior of Solids - Atomistic Theories (4)
- MAE 254P Mechanics of Solids and Structures (4)
- MAE 257P Fabrication and Characterization of Nanomaterials (4)
- MAE 229P Nanoscale Heat Transfer (4)

We are planning for all the courses to be developed specifically for the program, thus there will be no detracton from the educational experience of students enrolled in existing courses. Please note that while all concentrations and specializations will admit students initially, not all the courses in each concentration/specialization will be offered during the first year of program deployment, but will be introduced
over the first four years. Instructors who will develop these new courses will be compensated. While it could be argued that totally new courses require some iterations to settle into a solid class. We note however that our faculty have taught courses in the similar topics, or are currently teaching such courses. In fact, one could argue that the experience of teaching those previous versions of the courses will result in a more hands-on version for the MEng program.

As mentioned earlier, all courses in the program will be taught in class, but will make use of online technologies in different ways depending on the particular course content. Furthermore, all courses will require in-class assessment and in most cases, laboratory work will be conducted in-lab. The resources required to enable the technology enhancement of program courses is outlined in Section 6. Specifically, a recording room and equipment as well as a technical support person will be needed to assist instructors for that purpose.

Capstone projects can be individual or group projects. Students will select a particular emphasis area and will be assigned a faculty mentor, or will select a mentor whose area of expertise matches the project’s scope. The project selection process parallels the MS thesis topic selection process in traditional MS programs, or the senior design project selection process common in engineering programs. In some cases, projects are proposed by students, in other cases by their faculty mentor. While local industry is supportive of the program (see attached letter from Broadcom), its participation is welcome but is not essential at present.

One of the advantages of building this program from the ground up is to ensure that some continuity exists across courses (as opposed to “siloed” courses that were developed independently in traditional degree programs). The case studies can play a central role in ensuring such continuity in addition to streamlining (to the greatest extent possible) the lab tools, hardware, and software. This will not only ensure a consistent educational experience for students, but also have logistical and financial advantages for the program overall, making it easier to run the program.

Section 6. Resource requirements
The Master of Engineering program will be self-supporting. Thus, the expenses associated with the program will be charged to the tuition revenue. Below is a description of resources required in each category. Figure 20 shows the overall staffing structure of the program.
Figure 20. MEng Staffing Structure
6.1 FTE faculty

Courses in the MEng program will be taught by ladder rank faculty (including both LSoEs and Tenure Track Faculty members) and outside lecturers. Projected in Figure 21, the program will hire full time lecturers who will work primarily on tasks related to the MEng program. Such tasks include teaching the entrepreneurship/intrapreneurship courses as well as other courses as needed. In addition, the program revenue (comprised of the revenue to SSoE+ revenue to the Units and Departments) will fully fund a number of tenure-track full-time faculty positions at the Assistant, Associate and Full Professor levels. The FTE growth projections are shown in Figure 25. These faculty will be engaged full-time in teaching, research and service functions in their home departments. In exchange for each faculty position funded by the program, one course/section of the MEng program will be added to the regular departmental teaching load. This course/section does not have to be taught by the person hired to the funded position, and can be assigned by the chair any faculty member in the department responsible for that course/section. The remaining courses/sections will be taught by either: (1) regular faculty as overload or (2) outside lecturers from industry. If faculty teach a course/section as overload, they may ask for buyout. SSoE’s buyout policy requires the requesting faculty member to pay the equivalent of 1/8 of their salary (plus benefits) to their department. The department chair has the prerogative to accept or deny such buyout requests based on their assessment of its impact on the department’s ability to fulfil its overall teaching obligations.

6.2 Library acquisition

No additional library resources are anticipated. Students may make occasional use of existing online library subscriptions (e.g. ieeexplore, Springer, Elsevier) in their courses. A support letter from the UCI Librarian is included in Appendix 1: Letter of Support.

6.3 Computing costs

We have budgeted for the purchases, administration and management of computing facilities. Please see the budget justification in Appendix 10: Detailed 5-year budget and justification for details.
6.4 Equipment

Equipment needs comprise computers, software/license (e.g. National Instruments, Synopsys, Cadence), embedded systems boards/kits (e.g. Raspberry Pi), as well as power supplies, signal generators, and integrated systems such as tablets, mobile devices etc... as outlined in Appendix 10: Detailed 5-year budget and justification.

6.5 Space and other capital facilities

Table 4 summarizes the space needs for the program. Office space will be needed for the program personnel’s offices. Additionally, a shared space of 1500 sq. ft. will be needed for TAs at any given quarter, and a multimedia recording room to generate and edit online course content.

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Count</th>
<th>Sq.ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Director</td>
<td>1</td>
<td>140</td>
</tr>
<tr>
<td>Lecturer PSOE/Professor of Teaching</td>
<td>6</td>
<td>840</td>
</tr>
<tr>
<td>Program Manager</td>
<td>1</td>
<td>140</td>
</tr>
<tr>
<td>Business Officer/Sr. Financial Analyst</td>
<td>1</td>
<td>140</td>
</tr>
<tr>
<td>Student Affairs Coordinator</td>
<td>1</td>
<td>140</td>
</tr>
<tr>
<td>Technical Support &amp; Communications</td>
<td>1</td>
<td>140</td>
</tr>
<tr>
<td>Admin. Assistant, Course Management</td>
<td>1</td>
<td>140</td>
</tr>
<tr>
<td>TA Space</td>
<td>15</td>
<td>1500</td>
</tr>
<tr>
<td>Multimedia Recording Room</td>
<td>1</td>
<td>500</td>
</tr>
<tr>
<td><strong>Total space needed</strong></td>
<td></td>
<td><strong>3680</strong></td>
</tr>
</tbody>
</table>

6.6 Other operating costs

<table>
<thead>
<tr>
<th>Staff Title</th>
<th>% position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Manager</td>
<td>1 FTE</td>
</tr>
<tr>
<td>Student Affairs Coordinator</td>
<td>.50 FTE Y0, 1 FTE afterwards</td>
</tr>
<tr>
<td>Marketing &amp; Communications</td>
<td>.5FTE Y1, 1 FTE afterwards</td>
</tr>
<tr>
<td>Program Specialist</td>
<td>.5FTE Y2, .5 FTE Y4-5  1 FTE afterwards</td>
</tr>
<tr>
<td>Career Counselor</td>
<td>1 FTE</td>
</tr>
<tr>
<td>Financial Analyst</td>
<td>.5 FTE Y0-1, 1 FTE afterwards</td>
</tr>
</tbody>
</table>

Staff support

Staff support will be provided by the HSSoE staff and additional program staff hires (up to 5 staff FTE) funded from the tuition revenue. The program staff will provide day-to-day operational and administrative support including that...
for admissions, fellowships, appointments and general student affairs. The staff will also assist with the development of promotional and advertising materials to recruit students and with providing other administrative support.

**Teaching assistants**

![Figure 22. Number of teaching assistants needed for MEng program courses/sections](image)

Each course will have a teaching assistant allocated. The candidates will be chosen from among the Doctoral students in the SSoE.

### 6.7 Estimated 5-Year Budget for Implementing the MEng Program

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>YEAR 0</th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected Enrollment FTE</td>
<td>0</td>
<td>80</td>
<td>120</td>
<td>160</td>
<td>200</td>
</tr>
<tr>
<td>Annual Fees</td>
<td>$0</td>
<td>$42,000</td>
<td>$43,260</td>
<td>$44,558</td>
<td>$45,895</td>
</tr>
<tr>
<td>Total Fee Revenue</td>
<td>$0</td>
<td>$3,360,000</td>
<td>$5,191,200</td>
<td>$7,129,248</td>
<td>$9,178,907</td>
</tr>
<tr>
<td>LOAN FROM CAMPUS</td>
<td>$400,000</td>
<td>-$100,000</td>
<td>-$100,000</td>
<td>-$100,000</td>
<td></td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
<td>$400,000</td>
<td>$3,360,000</td>
<td>$5,091,200</td>
<td>$7,029,248</td>
<td>$9,078,907</td>
</tr>
<tr>
<td><strong>PROJECTED COSTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty Salaries</td>
<td>$77,000</td>
<td>$548,620</td>
<td>$645,419</td>
<td>$719,948</td>
<td>$955,462</td>
</tr>
<tr>
<td>Staff Salaries</td>
<td>$199,036</td>
<td>$236,216</td>
<td>$279,211</td>
<td>$279,832</td>
<td>$313,879</td>
</tr>
<tr>
<td>Benefits</td>
<td>$90,268</td>
<td>$161,423</td>
<td>$186,561</td>
<td>$190,360</td>
<td>$280,232</td>
</tr>
<tr>
<td>General Assistance</td>
<td>$306,032</td>
<td>$394,016</td>
<td>$472,819</td>
<td>$551,623</td>
<td></td>
</tr>
<tr>
<td>Supplies and Expenses</td>
<td>$16,500</td>
<td>$30,000</td>
<td>$31,500</td>
<td>$42,250</td>
<td>$53,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>$25,000</td>
<td>$85,000</td>
<td>$125,000</td>
<td>$165,000</td>
<td>$205,000</td>
</tr>
<tr>
<td>Travel</td>
<td>$15,000</td>
<td>$15,000</td>
<td>$22,500</td>
<td>$30,000</td>
<td>$37,500</td>
</tr>
<tr>
<td>Financial Aid</td>
<td>$322,850</td>
<td>$435,151</td>
<td>$542,058</td>
<td>$702,085</td>
<td></td>
</tr>
<tr>
<td>Campus Based Fees</td>
<td>$23,085</td>
<td>$34,628</td>
<td>$46,170</td>
<td>$153,900</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>$50,000</td>
<td>$246,425</td>
<td>$307,576</td>
<td>$376,029</td>
<td>$476,043</td>
</tr>
<tr>
<td>Indirect to School</td>
<td>$1,008,000</td>
<td>$1,557,360</td>
<td>$2,138,774</td>
<td>$2,753,672</td>
<td></td>
</tr>
<tr>
<td>Campus assessment</td>
<td>$221,048</td>
<td>$295,391</td>
<td>$367,738</td>
<td>$476,456</td>
<td></td>
</tr>
<tr>
<td><strong>NET FISCAL IMPACT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Program Revenue</td>
<td>$400,000</td>
<td>$3,360,000</td>
<td>$5,141,200</td>
<td>$7,029,248</td>
<td>$9,078,907</td>
</tr>
</tbody>
</table>
### 6.8 Revenue Disposition

The program revenue (including school charges and surplus) is projected to be about $10M/year and will provide funding for the following initiatives:

<table>
<thead>
<tr>
<th>Total Program Expense</th>
<th>$472,804</th>
<th>$3,228,498</th>
<th>$4,351,511</th>
<th>$5,420,578</th>
<th>$7,020,851</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Projected Balance (to dept/unit)</td>
<td>-$22,804</td>
<td>$131,502</td>
<td>$839,689</td>
<td>$1,708,670</td>
<td>$2,158,056</td>
</tr>
</tbody>
</table>

**Figure 23. Budget Projection (Years 0 – 8)**

A loan from campus will be sought to fund the expenses associated with the preparatory year (year 0). Based on the enrollment projections, it is anticipated the program will break even in its first year of operation, and become profitable starting in year 2. Loan repayment will take place starting year 2 and will continue through year 6. The detailed budget is shown in Appendix B.

We ran different financial scenarios to estimate the projected cumulative surplus (deficit) under different reasonable assumptions of inaugural cohort sizes. Under all the scenarios, the program will be profitable and self-sustaining in year 1 and beyond. The program will pay back the loan received starting in Year 2 and will be completely loan free starting in year 7.
Figure 24. Projected Schoolwide Net Yearly Revenue

FTE Faculty: One third of the program revenue will be used to fund up to 18 regular ladder rank faculty FTE when it reaches its target of 360 students. Additionally, existing faculty will be compensated for: (1) teaching courses in this program either as buyout or stipend, (2) supervising students in project and case studies courses and (3) administrative duties related to the program. In addition, 4-6 full time full-time lecturers (Senate members) will be hired to help teach some of the courses in this program (mainly entrepreneurship/leadership courses.)

Figure 25. Projected SSoE FTE Growth Funded by MEng (these FTEs are augmenting the FTEs already planned by the School)

Students: 33% of the revenue will be set aside for 2 or 3 year PhD fellowships supporting students in HSSoE (with 1-2 additional year(s) funded by the prospective advisor). Additionally, the program anticipates hiring one teaching
assistant for each course that is offered. It is estimated that up to 193-290 additional PhD students can be funded through this program. Finally, 10% of revenue will be set aside for financial aid of students in the self-supporting program. Part of this aid will target URM and female students.

**Figure 26. Projected Additional PhD Students Funded Through the MEng Program**

**Discretionary:** The remaining 1/3 of the net revenue will be split proportionately between the school and the Units/departments. The Units/Departments portion will be in proportion to the MEng enrollments in their respective concentrations. These funds will be used to: (1) enhance the quality of the program, (2) fund portions of the setup funds of new faculty and (3) other initiatives as needed to support the School’s and Departments’ mission.

**Discretionary Funds Projections**

**Figure 27. Discretionary Funds to School and Departments/Units**
Section 7. Graduate Student Support
Graduate students enrolled in both state-supported and self-supporting programs will be supported in three ways through this program:

1. **Teaching Assistants (Doctoral Students):** Each offered course will be provided with a teaching assistant. The TA will help run the course as well as with lab assignments when applicable. TAs will be normally selected from the graduate students pursuing traditional, state-supported degrees in Engineering.

2. **Aid to MEng students:** 10% of the MEng program revenue will be set aside for fellowships financial aid of students in the MEng program. This aid will target (in order of preference): (1) URM and female students, (2) California residents, (3) Domestic Students, and (4) International Students.

3. **Fellowships to Doctoral Students:** 33% of the revenue will be set aside for 2 or 3 year PhD fellowships supporting students in HSSoE (with 1-2 additional year(s) funded by the prospective advisor). Additionally, the program anticipates hiring one teaching assistant for each course that is offered. It is estimated that up to 193-290 additional PhD students can be funded through this program.

Section 8. Governance

Structure
The program’s governance structure is shown in Figure 28. The MEng program director, who reports to the Dean, works with an executive committee and is advised by an industry advisory board. Each concentration also has a director aided by graduate advisors, one for each of the specializations within the concentration. The program will be governed subject to the bylaws in Appendix A. The program bylaws were developed in strict accordance with university rules and guidelines. Membership in the program is open to all UCI faculty who thematically match the program’s scope. The program faculty elect the executive committee which assists the program director in running the program. The director is nominated through a process that adheres to university rules.

Industry Advisory Board
The Industry Advisory Board (IAB) is a critical component in the MEng governance as it represents the companies and businesses that hire the program’s graduates, or send their engineers to the MEng program for retraining. The program will seek periodic advice and review of courses from the board, as well as seek help from the member companies in defining and updating the skills needed from the program’s graduates, and also solicit their assistance in the capstone projects process through joint mentoring of the various student groups. To date, the following companies and their representatives have agreed to join the MEng’s inaugural IAB:

1. Ansys
2. Astronics
3. Broadcom
Section 9. Changes in Senate regulations

The only requested change in Senate regulation required will be approval of the unique Master of Engineering degree title, per the following instructions in the Compendium:

After completing procedures described in Sections II.A and II.B, most proposed actions involving undergraduate and graduate degree programs are final. However, proposals to create a new degree title on a given campus or to eliminate an existing degree title from a campus require additional review and approval. These include amendment of the Standing Order of the Regents (SOR 110.1) which specifies degree titles each campus is authorized to confer.

Section 10. Diversity (UCI only)

The program will set aside a number of fellowships available to student applicants from under-represented groups. The number and amount of these fellowships will depend on the available funds each year.

Section 11. Information required for SSPGDP

(1) Faculty Teaching and Advising

1.1. Faculty teaching ratio: What fraction of the program courses will be taught by ladder rank faculty?
1.2. Faculty workload: How many faculty members, and what proportion of the department’s/program’s faculty, will be involved in teaching courses in the proposed program? How
many additional courses, on top of their state-supported program teaching load, will they be responsible for?

1.3. Faculty overload: Among the courses taught by faculty, what percentage will be done by faculty overload? What percentage by faculty buyout (i.e., faculty using their remuneration from teaching in the program to buy out other course commitments)?

1.4. New Faculty: Does the extra workload require the hiring of new tenure-track faculty and/or full or part-time lecturers?

Courses in the MEng program will be taught by ladder rank faculty (including both LSoEs and Tenure Track Faculty members) and outside lecturers. The program will hire full time lecturers who will work primarily on tasks related to the MEng program. Such tasks include teaching the entrepreneurship/intrapreneurship courses as well as other courses as needed. In addition, the program revenue (comprised of the revenue to SSoE revenue to the Units and Departments) will fully fund a number of full-time faculty positions at the Assistant, Associate and Full Professor levels. These faculty will be engaged full-time in teaching, research and service functions in their home departments. In exchange for each faculty position funded by the program, one course/section of the MEng program will be added to the regular departmental teaching load. This course/section does not have to be taught by the person hired to the funded position, and can be assigned by the chair any faculty member in the department responsible for that course/section. The remaining courses/sections will be taught by either: (1) regular faculty as overload or (2) outside lecturers from industry. If faculty teach a course/section as overload, they may ask for buyout. SSoE’s buyout policy requires the requesting faculty member to pay the equivalent of 1/8 of their salary (plus benefits) to their department. The department chair has the prerogative to accept or deny such buyout requests based on their assessment of its impact on the department’s ability to fulfill its overall teaching obligations. However, we do not feel that such requests will have any significant impact on the programs’ teaching mission for the reasons outlined next.

A preliminary teaching load analysis was conducted and results are shown in Figure 29. The analysis assumed course sections of 40 or less students/section. The green portion shows the sections that will be taught by regular rank faculty and/or outside lecturers. School-wide, it is anticipated that about 12 courses/sections (the green bars) will need to be taught by regular faculty as overload teaching, or by outside lecturers. Given that split, and the fact that not all faculty who teach as overload will request buyout, we do not anticipate a significant impact on the departments’ ability to perform their state-supported teaching obligation. We would go even further to state that: **The MEng program will impact state-supported programs positively since the additional faculty lines funded by the program will increase the overall on-load teaching capacity of the SSoE departments, making it possible to develop and offer new courses or new sections in state-supported programs thus enhancing the quality of these programs by offering students more course topic and scheduling flexibility.**

![Figure 29. Projected Impact on teaching load](image-url)
(2) Faculty Advising

2.1. Will there be a program director for advising students or assisting with job placement? Is the person an existing faculty or staff member? How will the person be compensated?

2.2. Are faculty involved in advising students on requirements such as capstone projects or master theses? If so, how many faculty members? What is the expected faculty to student ratio for these activities?

The MEng program will have a School-level program director who will oversee the overall program. He/she will be assisted by staff as explained earlier. The individual concentrations will also have program directors who will advise students on courses they need to take and other matters related to the concentration. A staff person will be employed to assist students in job placement. The School already has such a person for two of its programs (MS Engineering Management and MECPs, both are shared with other schools. We anticipate hiring a full time person who will work with students starting in Fall quarter, organizing short lectures and helping them with their resumes, how to conduct themselves in interviews and perform when doing a presentation. With the help of industry, this person will also assist in setting up an end of the year symposium where program students will present their projects to faculty, staff and industry representatives as well as recruiters. Capstone projects will be conducted in a manner similar to a state-supported MS thesis courses. MEng students can take up to 8 units (2 courses) of Capstone project under the mentorship of a faculty member. Typically, students can be clustered into groups whose size will vary depending on the complexity of the projects they undertake. Projects can be proposed by faculty members or by industry representatives.

(3) Facilities and Staff Support

![Figure 30. Classroom Utilization vs Size (Current vs. MEng Year 8)](image)

3.1. Any dedicated space for the proposed program?
The School will provide space for the program growth. The interdisciplinary science and engineering building with 180,000 square feet of space (half of which is earmarked for SSoE) will significantly enhance the Schools’s ability to grow both research and educational programs. The building is expected to come online in 2019 when the program is slated to start.

3.2. Will the courses be taught in existing facilities? If so, how will the arrangement impact the scheduling of existing classes, and how much will the existing facilities be used?
The program courses will be taught in UCI classrooms and scheduled similarly to state-supported courses. A preliminary analysis on classroom utilization shown in Figure 30 shows that there will be increased demand on smaller classrooms. However, these smaller classrooms have additional availability (as opposed to large classrooms which are
almost fully utilized. Furthermore, MEng courses could (as need arises) be scheduled after hours or on Saturdays, further reducing pressure on classrooms campuswide.

3.3. Any additional facilities required for the program? E.g., classrooms, laboratories, recording facilities (for online lectures/discussions)
Existing lab facilities will be used to teach relevant MEng courses. When needed and appropriate, the program will negotiate the financial aspects of such access.

3.4. Who provides support? Does the program require staff personnel? Will new additional staff personnel be hired? If so, how many?
The program will hire additional staff as shown in Table 5.

3.5. Will the courses of the program create needs for additional TAs? Are there enough graduate students to serve as TAs?
Each course taught in the program will be assigned a Teaching Assistant. The number of teaching assistants is shown in Figure 22. The Samueli School’s graduate student population is close to 1000 (about half being PhD students) which provides more than sufficient pool for TAs. As discussed earlier, one third of the MEng revenue will be earmarked for Doctoral student support. The PhD fellowships funded by the programs will be augmented by teaching assistantships in some cases. It is estimated that up to 193-290 additional PhD students can be funded through this program. This will enable the school to fund more doctoral students, and correspondingly grow its overall PhD population further as shown in Figure 31.

![SSoE Graduate Population](image-url)

**Figure 31. SSoE Graduate Population**

(4) Financial Accessibility

4.1 In accordance with the 2016 Presidential Policy on “Self-Supporting Graduate Professional Degree Programs,” a proposal must state an articulated financial accessibility goal for their students and a student financial support plan for achieving that goal.

4.2 Examples of possible student financial support plan components include providing scholarships or grants from the program’s own resources (e.g., return-to-aid from program tuition and fees assessed but not from state funds or tuition and/or fees charged to students in state-supported programs, or funds
raised through private philanthropy), providing tuition and fee waivers, participation in federal and/or private loan programs, and participation in other external support programs such as veterans benefits.

4.3 If financial aid is the primary means to achieve financial accessibility, proposal shall state its rate of return-to-aid (if zero, state zero).

10% of the MEng program revenue will be set aside for fellowships financial aid of students in the MEng program. This aid will target (in order of preference): (1) URM and female students, (2) California residents, (3) Domestic Students, and (4) International Students. Additional aid could be set aside by individual concentrations from the discretionary funds they receive.

(5) Impacts on Related State-supported Programs

5.1 Will the enrollment of any existing state-supported program(s) be adversely affected by the creation of the program?

As discussed before, the MEng program will have a net positive impact on the School’s state-supported programs. Most of this growth will be in the doctoral program. The state-supported MS programs will be maintained at their current levels.

5.2 How would faculty participation (both in teaching and advising of students) in existing state-supported programs be affected by the proposed program?

Please see response to Question 1 above.

5.3 How would staff support of existing state-supported programs be affected by the proposed program?

Please see response to Question 1 above.

5.4 Will there be foreseeable impacts on the class sizes of courses offered by the existing state-supported programs?

Please see response to Question 1 above.

5.5 Will new courses offered by the proposed program be made available to students enrolled in state-supported programs of the same department or school?

Not at the present moment. One of the ideas to explore is an access model between state-supported and self-supported courses. Our assumption at the present time, however, is that the two categories of courses are separated.

5.6 Will the new program create competing needs for instructional facilities and physical and intellectual infrastructures in the proposed department/school? Will new infrastructures and facilities be created to share with related state-supported programs?

The classroom analysis shown in Section 3 indicates that the campus can easily accommodate the needs of the MEng program.

(6) Admissions Criteria

6.1 What are the expected initial and steady-state enrollments?

6.2 What are the admissions criteria? How do they compare to other similar programs of comparable standing?

6.3 Do admissions criteria specify some type of work experience in the field?
Please see Sections 2.1 and 3.6 of the proposal for this information.

6.4 **What measures are taken to ensure that unqualified students are not admitted for financial reasons?**

Each MEng concentration will have its own major code, and admissions will be handled by the concentration faculty. In our experience with other self-supporting programs, the population of students admitted to these programs is comparable in quality to state-supported programs (see Table 6 showing the qualifications of students admitted into the first cohort of the Master of Embedded & Cyber-physical Systems Self-supporting degree). Given the large number of applications to our graduate programs, and the fact only a portion of the very qualified top group of these applicants are admitted to our current state-supported MS programs, it is easy to see that there still exists a large pool of applicants who quality for those programs but could not be admitted due to the limits on the number of MS students that are admitted each year. The feedback from UCB’s ME program (Appendix C) about quality resonates well with us and the program will commit to maintaining high standards of graduating students who are very likely to succeed in their careers.

<table>
<thead>
<tr>
<th>Table 6. MECPS admitted students profile</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average GPA</strong></td>
</tr>
<tr>
<td><strong>Average GRE</strong></td>
</tr>
<tr>
<td><strong>Average TOEFL</strong></td>
</tr>
<tr>
<td><strong>Average IELTS</strong></td>
</tr>
</tbody>
</table>

(7) **Financial Viability Analyses**

7.1 A proposal should include a market analysis of the viability of the self-supporting program.

The Market analysis report is provided in Appendix E. In addition, 5% of the revenue will be set aside for contingency, to handle potential year-to-year variability.

7.2 The proposal should include a copy of the cost analysis that is submitted to Budget and Capital Resources and UCOP. CCGA understands that the cost analysis submitted is of a provisional nature.

7.3 It should specify the source and nature of any financial support, including start-up funding and loan(s).

7.4 It should specify the launch date of the new program.

7.5 It should describe the phase-in process to demonstrate that it satisfies the self-supporting requirement of a SSGPDP and specify when the phase-in period is forecasted to end.

Please see Appendix 10: Detailed 5-year budget and justification in the proposal.
References
[14] https://www.thebalance.com/list-of-engineering-skills-2063751
Appendix 1: Letter of Support from the Dean
February 27, 2018

Fadi J Kurdahi, Associate Dean for Graduate and Professional Studies  
Samueli School of Engineering  
University of California, Irvine, CA 92617

Dear Professor Kurdahi,

Since arriving to UCI’s Samueli School of Engineering, I have had the vision for a premier Masters of Engineering program. With the budget climate as it was, we collectively had the foresight that a self-supporting program would help our School meet its financial needs while at the same time setting us apart from other Engineering programs. I am very pleased to write this letter of support of the proposal that you have created for such a program.

Every year since I joined this wonderful institution, I have presented this vision to the faculty and charged them with the initiative to create such a program. In 2017, we established a strategic plan for The Samueli School of Engineering with the overarching goal of “developing human connections to reach the Top 25 by 2025.” As part of our strategic goals, we hope to increase global relevance by offering self-supporting programs in areas of high regional, national, and/or international interest. The component of experiential learning and capstone project in this proposal will also allow The Samueli School of Engineering to meet our strategic goals of allowing students to engage in project-based learning and exploring different innovative pedagogies that will result in greater human connection. These outcomes are also in clear alignment with UCI’s stated strategic goals.

In full support of this program, I would like to mention explicitly my commitment related to space allocation. In terms of program start-up we have identified initial space for program staff in Engineering Hall. As far as program growth is concerned, we have effectively fundraised and will have a new Interdisciplinary Science and Engineering building tentatively in late 2020. This new space will increase the School’s ability to provide additional space for this program. As the program grows, the School will work with leadership to provide space to accommodate the program as outlined in the proposal. In addition, I will help identify external resources that can help grow this program to a premier Masters of Engineering program.
I look forward to having this vision come to reality!

Warmest Regards

[Signature]

Gregory Washington, Ph.D.
Professor and Stacey Nicholas Dean
Appendix 2: Additional Letters of Support

1. Letter of Support from Frances Leslie, Dean of the Graduate School
2. Chairs’ letters of support:
   - Kumar Wickramasinghe (EECS)
   - Derek Dunn-Rankin (MAE)
   - Abraham Lee (BME)
   - Sunny Jiang (CEE)
3. Industry Letters
4. UC Reviewers' Letters (Chris Lynch, UCLA, Lee Fleming, UCB)
March 8, 2018

Dr. Fadi Kurdahi  
Associate Dean  
Samueli School of Engineering

Dear Associate Dean Kurdahi,

I am pleased to provide a letter in support of the proposed Master of Engineering. This Self-Supporting Graduate Professional Degree Program (SSGPDP), to be housed in the Samueli School of Engineering, will not only train students in the foundation, skills, and practices of engineering, but will also provide entrepreneurship and leadership courses that will prepare graduates for successful careers in industry. This combination of disciplinary training and broad professional skills is responsive to employer needs, and I expect that the program will be in great demand.

UC Irvine’s strategic plan includes goals to grow our graduate student population and develop innovative professional programs. Programs like the Master of Engineering will help our campus to meet those goals while providing valuable career training and generating resources to support additional doctoral students. As Graduate Dean, I strongly support this proposal and look forward to its approval and successful launch.

Sincerely,

[Signature]

Frances Leslie  
Vice Provost for Graduate Education  
Dean, Graduate Division
November 15, 2017

TO: Fadi Kurdahi  
   Associate Dean for Graduate and Professional Studies, HSSoE

RE: MEng professional degree proposal

The department of Civil and Environmental Engineering enthusiastically supports the development of Master of Engineering Professional Degree program within the Henry Samueli School of Engineering. This program will benefit the working professionals by providing the most up-to-date job skills and practical knowledge. The program will strengthen the connection and collaboration between academic research and industrial practice to solve the contemporary issues that facing the human society. The department will contribute to the program by offering Master of Engineering with Concentration in Civil and Environmental Engineering. Within this concentration, students will also have the opportunity to specialize in Structure & Earthquake Engineering, or receive a certificate in Water & Energy Nexus Engineering.

Thank you for leading this important effort.

Sincerely,

Sunny Jiang, Ph.D.  
Chair and Professor  
Department of Civil and Environmental Engineering
December 19, 2017

Fadi Kurdahi
Associate Dean for Graduate and Professional Studies
The Henry Samueli School of Engineering

Dear Professor Kurdahi,

I am writing to express my enthusiastic support for the new self-supporting Master of Engineering program that is being proposed by the Henry Samueli School of Engineering. The 12-month program will provide rigorous and practical hands-on team-based training in biomedical innovation, entrepreneurship/intrapreneurship and commercialization. This program will address an area of great need for local businesses, students and industry.

In addition, the program offers the department the opportunity to better manage its own budget. The program budget projects a small surplus with 80 students, and a more significant surplus with 360 students. A priority for the department is to use the surplus toward enhancing graduate student support. We foresee supporting our Ph.D. and perhaps some of our M.S. students with fellowships.

Please do not hesitate to contact me if you have any questions.

Sincerely,

[signature]
Abraham Lee, Ph.D.
William J. Link Professor and Chair
Department of Biomedical Engineering
Director, Micro/Nano Fluidics Fundamentals Focus (MF3) Center
Director, Center for Advanced Design and Manufacturing of Integrated Microfluidics (CADMIM)
BME Website: http://www.eng.uci.edu/bme
February 12th, 2018

To: Fadi Kurdahi, Associate Dean for Graduate and Professional Studies, HSSoE
Re: MEng professional degree proposal

The department of Electrical Engineering and Computer Science enthusiastically supports the development of the Professional Master of Engineering Degree program within the Henry Samueli School of Engineering. This program is aimed at benefiting working professionals by providing up-to-date job skills and practical knowledge. Additionally, it will strengthen the collaboration between academia and industry to solve grand challenge issues that face our society. Prior to moving to UCI, I spent 24 years at IBM Research, where I was an IBM Fellow and CTO of Science and Technology at the Almaden Research Center. During my tenure at IBM, we routinely sponsored employees to go out and improve their skills by taking specialized Master Degrees in various topics. These programs proved to be invaluable for employees to rapidly gain the needed skills for various projects.

The EECS department will be offering a Professional Master of Engineering in Electrical Engineering and Computer Science. Within this degree program, students will have the opportunity to specialize in High Speed Communications Circuits and Systems and Digital Signal Processing. I look forward to working with you as this program evolves.

H. Kumar Wickramasinghe
The Henry Samueli Endowed Chair
Chairman and Professor of Electrical Engineering and Computer Science
Professor of Biomedical Engineering
Professor of Chemical Engineering and Materials Science
University of California Irvine, Irvine, CA 92697-2625
Phone: (949) 824-0378
January 26, 2018

Fadi Kurdahi
Associate Dean for Graduate and Professional Studies
The Henry Samueli School of Engineering

RE: MAE Department Support for Master of Engineering Program

Dear Professor Kurdahi,

I am writing to convey the unanimous Department support for the new Master of Engineering degree program proposed by the School of Engineering. The formal vote from our Department was 14-0, with the understanding that our sample Specializations are representative of offerings we can provide that would be of educational value to an important cohort of students not reached with our regular M.S. degree.

Sincerely,

Derek Dunn-Rankin
Professor and Chair
office phone: (949) 824-8451
e-mail: ddunnran@uci.edu
January 29, 2018

Fadi Kurdahi, Associate Dean
The Henry Samueli School of Engineering
University of California, Irvine
Irvine, CA 92617

Dear Fadi,

I have reviewed the prospectus for the Master Engineering degree being proposed by the Samueli School of Engineering. I find the proposal to be timely and relevant. With the increasing complexity of today’s engineered systems, be it a system-on-a-chip or an Airbus A380, the need for highly educated engineers is becoming more acute. In contrast, the number of units required for a bachelor’s degree in engineering is decreasing. Thus, companies are increasingly interested in hiring engineers who have a Master’s Degree and who have acquired a good deal of hands-on experience through projects. Furthermore, the highly dynamic and team-oriented workplace requires sharpened entrepreneurial capabilities that augment an engineer’s technical education, making them more efficient as part of a team. The proposed Master of Engineering degree addresses all these points. It is an interdisciplinary, systems-oriented graduate degree emphasizing the skills required to bring products to market and it will be very useful to Broadcom and other companies competing in this space. Another key aspect to the program is the practical “hands-on” emphasis of the curriculum. This will enable graduates to accelerate their career trajectory in industry because of the specific skills they will gain from this type of graduate program. The planned online and blended format of the courses also makes the MEng degree suitable for mid-career professionals who are seeking to acquire new skills that will help them move their careers forward.

At Broadcom (where I was Vice President for RF Technologies, Antennas and University Relations), which is one of the largest fabless semiconductor companies in the world, we shared the vision embodied by this professional degree program. Presently, as Vice President at Broadcom Foundation in charge of University Relations and Academic Programs, I will be happy to help in an advisory capacity as you build up this program, and I look forward to working with you to train and graduate future engineers that can help companies such as Broadcom Limited become more competitive.

Sincerely,

Nicolaos (Nick) G. Alexopoulos
Vice President for Academic Programs and
University Relations
Irvine, December 20th, 2017

Fadi J Kurdahi, Associate Dean
The Henry Samueli School of Engineering
University of California,
Irvine, CA 92617

Dear Professor Kurdahi,

Thank you for the opportunity to comment on the proposed Master of Engineering degree proposal.

ANSYS is the global leader in Pervasive Engineering Simulation. We help the world’s most innovative companies deliver radically better products to their customers. By offering the best and broadest portfolio of engineering simulation software, we help them solve the most complex design challenges and create products limited only by imagination.

We see a lot of potential in the proposed degree program and are very supportive of it. In today’s highly connected world, it is important for engineers to be excellent performers not only on the technical level but also in a broader perspective that includes communication, intrapreneurial and interpersonal skills. The proposed Master of Engineering program provides its graduates with a healthy mix of skills that, while promoting the intrinsic technical knowledge, also enhances their ability to work in, and lead teams in a corporation. We are also pleased to see the emphasis on the hands-on experience that students will acquire through a capstone project. Often times, engineers perform well on finding solutions to point problems, but lack the experience of integrating systems into a working prototype. The experiential learning component in the Master of Engineering degree will go a long way towards enhancing such skills in its graduates. We are pleased to be involved in this effort by being part of the advisory board and look forward to working with the UCI team to provide a worthwhile professional educational experience to students, and positions them to be prime contributors in today and tomorrow’s highly demanding workplace.

Best regards,

Gilles Eggenspieler, Ph.D.
Director Academic Program - North America
gilles.eggenspieler@ansys.com
(412) 535 2989
December 22, 2017

Dear Professor Kurdahi,

Thank you for sending your proposal for the Master of Engineering Degree at the Henry Samueli School of Engineering. As President of Astronics Test Systems, I am writing to express our support for the proposed plan.

Astronics Test System, headquartered in Irvine, is focused on delivering integrated solutions to a number of core industries including Consumer Electronics, Defense, Aerospace, Transportation, and is currently exploring Biomedical and Security as new market opportunities.

These industries align well with the direction of your proposal.

In addition, our experience has been that graduates with purely a Bachelor’s degree are often missing some of the important hands-on experience which is an important part of our hiring selection. For example, we often see software engineers that have not had the experience in building solutions where both hardware and software need to work together. I’m pleased to see that the proposed Master of Engineering program will provide students with both an integrative knowledge of systems as well as applied, hands-on experience through a capstone project.

I am pleased that our company has the opportunity to serve on the advisory board to offer an industry prospective on what is necessary to be successful in the field today. We look forward to opportunities to collaborate with the Master of Engineering program in the future.

We wish you all the best with your new program. Please keep us updated.

Best regards,

Jim Mulato
President
Astronics Test Systems
November 17, 2017

Fadi J. Kurdahi
Associate Dean for Graduate and Professional Studies
The Henry Samueli School of Engineering
Director, Center for Embedded & Cyber-physical Systems (CECS)
Professor, Electrical Engineering & Computer Science
Professor, Information & Computer Science
3207 Engineering Hall
University of California
Irvine, CA 92697

RE: Residential School Wide Master of Engineering Self Supporting Program

Professor Kurdahi,

It is a pleasure to provide a letter in support of the proposed residential school wide master of engineering program at the University of California Irvine. As the inaugural director of the Master of Science in Engineering Online Program (MSOL) at UCLA I have seen firsthand the benefits a self-supporting program can bring to an engineering school in the UC system. The MSOL program has brought recognition to UCLA through achieving a #1 US News and World Report ranking among online programs. This program has enabled many talented graduate students to earn their MS degree at UCLA that otherwise would not have had access to an advanced degree. It has brought benefits to campus faculty by enabling them to reach a larger number of students and through additional salary that reduces their likelihood of being recruited to another institution. It has also brought benefits to our graduate students in the form of support for teaching assistant positions. Although most of the courses in this program are taught by regular UCLA faculty, the MSOL program has also enabled us to engage experts from local industry as adjunct faculty, thus strengthening our ties with industry. Finally, and importantly, the MSOL program has produced a needed revenue stream for the Henry Samueli School of Engineering and Applied Science at UCLA.

In reviewing your proposed program it appears very likely that it will bring similar benefits to UCI. The program that you have proposed is well organized. It begins with a financial analysis that indicates the program will be self-sustaining after year 1. Based on my experience with the MSOL program, you will very likely meet this goal upon admission of your second cohort. The integrative systems approach, rather than a research approach, is of considerable interest to industry and will provide an educational foundation for professionals to advance into management. The inclusion of 25% to 33% management and related courses while maintaining a predominantly technical approach
adds an important dimension to your program, but does not result in excessive overlap with UCI’s existing engineering management program. In my extensive international marketing of the UCLA MSOL program it became clear that international students are interested in coming to the United States for the cultural and language experience as much as for the education. You are very likely to attract international students to this residential program.

Your human resources plan with respect to faculty and staff looks reasonable, and the impact of the generated resources on your Ph.D. program will very likely contribute to UCI’s already strong reputation.

Sincerely yours,

Professor Christopher S. Lynch
Chair of Mechanical and Aerospace Engineering, UCLA
Subject: Re: UCI SSPGDP Proposal
Date: Thursday, January 25, 2018 at 4:50:21 PM Pacific Standard Time
From: Lee Fleming
To: Fadi Kurdahi
Attachments: image001.png

Dear Dean Kurdahi,

This is very similar to our MEng and I believe should be successful. We have almost 400 students now in our 7th year, and I am beginning to worry about quality, so you should be careful as you ramp up. English communication skills are also a challenge - I would budget explicitly for that.

I commend you on specifying where the funds will be spent before initiating the program and in your plans for re-investment. That was not specified before I got here and it has caused many problems.

Also, it has worked well to have myself as a ladder faculty from a business school (my PhD is from Stanford engineering but I spent 13 years and got tenured at the Harvard Business School). It is very easy for engineering faculty to dismiss the business and leadership component, but if you do, then it is difficult to maintain quality of instruction. The modal energy state for these types of programs is successful entrepreneurs who come in a tell war stories. It is popular with the students but typically content free. I would consider appointing a ladder faculty from your business school to oversee the business and leadership components of your program. I have built a demanding case discussion environment here and I believe it has paid off - we had 6 30 under 30 awards from Forbes and Inc in our first five classes.

Good luck!

Lee Fleming
Faculty Director, Coleman Fung Institute for Engineering Leadership
Coleman Fung Chair in Engineering Leadership, IEOR, College of Engineering
Management of Organizations, Haas School of Business
UC Berkeley

On Thu, Jan 25, 2018 at 4:27 PM, Fadi Kurdahi <kurdahi@uci.edu> wrote:

Dear Professor Fleming

At UCI we are in the process of proposing a new graduate program leading to Master of Engineering. In accordance with the review policy established by the systemwide Coordinating Committee of Graduate Affairs (CCGA), I am providing you, as the Chair/Director of an existing comparable program, with a copy of the current draft prospectus of our proposal. If you require so, I am happy to send the full proposal as a link (it is too large to fit in an email). We would be very grateful for any feedback you may wish to offer us, so that the proposal may be made as strong as possible before submission.

As background, please understand that the format and contents of the proposal follow the required outline found in the CCGA Handbook, and that internal and external reviewers will later be asked to address the following four points when examining our final submission:

- Quality and academic rigor of the program
- Adequacy of the size and expertise of faculty to administer the program
- Adequacy of the facilities and budgets
- Applicant pool and placement prospects for the graduates

If you wish to provide feedback, we would like to receive it within four weeks of the date of this email, since we expect to submit the proposal for campus review at that time. Earlier feedback would be very much appreciated, though.

Best regards,

Fadi Kurdahi
Appendix 3. Library letter of support
November 9, 2017

TO: Professor Fadi Kurdahi, Associate Dean for Graduate & Professional Studies, The Henry Samueli School of Engineering

FROM: John Renaud, Associate University Librarian for Research Resources

RE: Proposed Master of Engineering Degree at the Henry Samueli School of Engineering

The UCI Libraries support the proposal for this new degree program, Master of Engineering (ME) at the Henry Samueli School of Engineering (HSSoE). The market research cited in the prospectus shows the existing interest in this program on the part of potential students in California and worldwide.

The Libraries ongoing collecting strategies in these areas will continue to strengthen our offerings to faculty and students working in these disciplines. In addition, the program will emphasize technical, hands-on, experiential, and applied knowledge rather than a more traditional research emphasis. In the Program’s initial phases, it is likely that the Libraries will be able to meet the new ME program’s resource needs with our existing collection strategies and education and outreach strategies. Should the required courses, elective courses, or capstone projects that will comprise this Program necessitate that the Libraries alter or expand our collecting parameters or create an increased need for education and outreach support, we will work with Samueli School of Engineering to determine how we can best address those needs.

The Libraries will work with the HSSoE to ensure that necessary support is provided to users, including instructional workshops and classes. The UCI librarians specializing in the different disciplines on which students with this Program will focus have all expressed great enthusiasm for this endeavor and are available to offer assistance and instruction as needed.

Sincerely,

John P. Renaud
Appendix 4: Faculty Vote
Department of Biomedical Engineering

Master of Engineering Program

A faculty vote was taken via EEE and reported on December 19, 2017

25 faculty members with the overall vote 20 (yes) – 0 (no) – 1 (abstain)

<table>
<thead>
<tr>
<th>Faculty members</th>
<th>Yes</th>
<th>No</th>
<th>Abstain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professors: 12</td>
<td>8</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Associates: 7</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assistants: 6</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Wednesday, December 20, 2017 at 11:07:31 AM Pacific Standard Time

Subject: FW: Preparing for the MEng proposal
Date: Wednesday, December 20, 2017 at 11:06:12 AM Pacific Standard Time
From: Fadi Kurdahi
To: Fadi Kurdahi

From: April Marie Heath <heatha@uci.edu>
Date: Wednesday, December 20, 2017 at 9:20 AM
To: Fadi Kurdahi <kurdahi@uci.edu>
Cc: Sunny Jiang <sjiang@uci.edu>
Subject: RE: Preparing for the MEng proposal

Hi Fadi,

The CEE vote on the MEng program was taken on December 7, 2017: 16 in favor, 0 against, 2 abstained.
Thank you, April

--
April Heath
Graduate Coordinator
University of California, Irvine
Civil and Environmental Engineering Department
E/4130 Engineering Gateway
Irvine, CA. 92697-2175

Phone: (949) 824-0584
Fax: (949) 824-2117
a.heath@uci.edu
1. I accept the School-wide proposed framework and concept for implementing an advanced professional degree program in engineering, Master of Engineering:

- 14 responses, 100% Yes
- 0 responses, 0% No

2. I support the MAE Concentration in the Master of Engineering degree program:

- 14 responses, 100% Yes
- 0 responses, 0% No

3. Comments and Conditions:

- My support is tentative and mostly out of respect for the faculty who have invested time in drafting the proposal. I am not convinced that this is the right direction for the department under the present circumstances of strained resources and stagnant rankings. A realistic cost-benefit analysis would have considered the benefit of investing more in research rather than investing in educational programs that will do little to improve our rankings and **might** become profitable in 10 years.

- It would be good to identify one or two members of the department (skeptics perhaps) and MAE reps in development of the program.

- 2 responses, 14% Yes
- 12 responses, 86% No answer entered

Survey: MAE Faculty Vote - Master of Engineering Program

Responses to 3 questions

# of submissions: 14
# of possible respondents: 25

1. I accept the School-wide proposed framework and concept for implementing an advanced professional degree program in engineering, Master of Engineering:

- 14 responses, 100% Yes
- 0 responses, 0% No

2. I support the MAE Concentration in the Master of Engineering degree program:

- 14 responses, 100% Yes
- 0 responses, 0% No

3. Comments and Conditions:

- My support is tentative and mostly out of respect for the faculty who have invested time in drafting the proposal. I am not convinced that this is the right direction for the department under the present circumstances of strained resources and stagnant rankings. A realistic cost-benefit analysis would have considered the benefit of investing more in research rather than investing in educational programs that will do little to improve our rankings and **might** become profitable in 10 years.

- It would be good to identify one or two members of the department (skeptics perhaps) and MAE reps in development of the program.

- 2 responses, 14% Yes
- 12 responses, 86% No answer entered
Subject: Vote Results - EE Professional Masters Program  
Date: Tuesday, January 30, 2018 at 10:57:51 AM Pacific Standard Time  
From: Elvia Salas  
To: Ozdal Boyraz, Fadi J. Kurdahi (UCI), Hemantha K Wickramasinghe (UCI)  
CC: Julie S. Strope  

Dear Ozdal, Fadi and Kumar,  

Please see below.  

The vote was sent to all EECS faculty  
- 30 Senate Faculty  
- 1 LSOPE  
  - # of submissions: 17  
  - # of possible respondents: 31  

Introduction:  
Do you approve the starting of an Electrical Engineering Professional Master Degree Program?  
For information on the list of courses please go here: Slides  

Vote:  

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<thead>
<tr>
<th>Votes</th>
<th>Percentage</th>
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<tr>
<td>13/17</td>
<td>76%</td>
<td>Approve</td>
</tr>
<tr>
<td>2/17</td>
<td>12%</td>
<td>Disapprove</td>
</tr>
<tr>
<td>2/17</td>
<td>12%</td>
<td>Abstain</td>
</tr>
</tbody>
</table>

Comments:  
- I support the general notion of a professional program, but the specific courses listed do need some refinement  
- Survey is ambiguous.
Appendix 5: Faculty Vitae
James E. Bobrow

EDUCATION
Ph.D., Engineering Systems, University of California, Los Angeles, 1982
M.S., Mechanical Engineering, University of California, Los Angeles, 1979
B.S., Mechanical Engineering, California State University, Long Beach, 1977

ACADEMIC EXPERIENCE
UC Irvine, Professor, Mechanical and Aerospace Engineering, 1996 – Present
MIT, Visiting Professor, Mechanical Engineering, 2005 – 2006
UC Irvine, Associate Professor, Mechanical and Aerospace Engineering, 1990 – 1996
Stanford University, Visiting Associate Professor, Computer Science Department, 1990 - 1991
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 1983 -1984

NON-ACADEMIC EXPERIENCE
Board of Directors, Robomedica, Inc.
Created robots and automation devices for several start-up companies, including Robomedica, Inc.and Cobra Technologies

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Society of Mechanical Engineers
Institute of Electrical Electronic Engineers

HONORS AND AWARDS
Fariborz Maseeh Best Teaching Award, 2005

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA - None

SERVICE ACTVITIES outside UNIVERSITY OF CALIFORNIA
Associate editor of the IEEE Transactions on Systems, Man, and Cybernetics. Part B:
Cybernetics from 2008-2011

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:
2010.

PROFESSIONAL DEVELOPMENT ACTIVITIES - None
Jacob Brouwer

EDUCATION
Ph.D, Mechanical Engineering, Massachusetts Institute of Technology, 1993
M.S., Mechanical Engineering, University of California, Irvine, 1989
B.S., Mechanical Engineering, University of California, Irvine, 1987

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 2011-present
UC Irvine, Adjunct Associate Professor, Mechanical and Aerospace Engineering, 2008 – 2011
UC Irvine, Adjunct Assistant Professor, Mechanical and Aerospace Engineering, 2004 – 2008
University of Utah, Research Assistant Professor, Mechanical Engineering, 1993 - 1997

NON-ACADEMIC EXPERIENCE
National Fuel Cell Research Center, U.C., Irvine, Associate Director, 1997 – Present
Sandia National Laboratories, Livermore, California, Staff Scientist, 1991

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
ASME, 2000 – Present
AIAA, 2003 – Present

HONORS AND AWARDS
Eni Award Nominee, 2013
Katerva Award Nominee, 2012
International Who’s Who of Professionals, Honored Member, 2006
National Academy of Engineering, Invited Lecturer, 2004
Sigma Xi Scientific Research Society Member, 1992
Summer Internship Award, Sandia National Laboratories, 1991
Summa Cum Laude, 1987
Tau Beta Pi Association Member, 1986

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
California Alliance for Minority Participation (CAMP) in Science, Engineering and Mathematics
research advisor to undergraduate student summer research projects, 2009 – Present
Test of English Proficiency (TOEP), 2010- Present
Mechanical and Aerospace Engineering Dept. – Faculty Meeting Recorder, 2011 - Present
Mechanical and Aerospace Engineering Dept. – Undergrad. Studies Comm. Mem., 2011- Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA


SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:

PROFESSIONAL DEVELOPMENT ACTIVITIES – None
Donald Dabdub

EDUCATION
Ph.D., California Institute of Technology, Chemical Engineering, 1995
M.S., California Institute of Technology, Chemical Engineering, 1992
B.S., Lehigh University, Chemical Engineering, 1990

ACADEMIC EXPERIENCE
UC Irvine, Professor, Mechanical and Aerospace Engineering, 2005 - Present
UC Irvine, Associate Professor, Mechanical and Aerospace Engineering, 2000 – 2005
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 1995 – 2000

NON-ACADEMIC EXPERIENCE
Mitsubishi Electric & Electronics USA, Inc., 2009
Government: California Air Resources Board, 2001
Government: Environmental Protection Agency, 1999

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Member American Association for Aerosol Research
Member American Geophysical Union

HONORS AND AWARDS
Professor of the Year, UC Irvine, Mechanical and Aerospace Engineering, 2007 - 2008
Honorary Professor Award, Pi Tau Sigma, 2005
Gaspar de Portola International Fellowship, 2002
Project Prometheus Teaching Award, UC Irvine, 2001
National Science Foundation Career Award, 2000
W.E. Schiesser Distinguished Lecture, Lehigh University, 1999
Faculty Career development Award, UC Irvine, 1997 - 1998
William Corcoran Fellowship, 1990–1995

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member of the HSSoE Sustainable Energy Committee, 2009
Member of the UCI Environment Institute Steering Committee, 2008 - present
Member of the Energy and the Environment Academic Planning Committee, 2008
Member of the HSSoE Environmental Engineering Review Committee, 2007 - 2009
Member of the Conflict of Interest Oversight Committee, 2001, 2002
Chairman of the School of Engineering Faculty Research and Travel Committee, 1999 - 2000

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Organizer of the national meeting for the American Association for Aerosol Research (AAAR)
for the past 7 years. AAAR is the leading U.S professional organization for scientists and engineers who wish to promote and communicate technical advances in the field of aerosol research.
Organizer of the International Aerosol Conference. This conference is held every four years and brings together much of the worldwide aerosol research community to share state-of-the-science research.

Member of various advisory panels in topics directly relevant to air quality in California: John Wayne Airport; U.S. Department of Defense; California Energy Commission; Air Resources Board of California; Electric Power Research Institute.

Chairman of the Annual Symposium on Kinetics and Photochemical Processes in the Atmosphere.

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES - None
Derek Dunn-Rankin

EDUCATION
Ph.D., Mechanical Engineering, UC Berkeley, 1985
M.S., Mechanical Engineering, UC Berkeley, 1984
B.S., Mechanical Engineering, UC Santa Barbara, 1980

ACADEMIC EXPERIENCE
UC Irvine, Professor, Mechanical and Aerospace Engineering, 1998 – Present
UC Irvine, Associate Professor, Mechanical and Aerospace Engineering, 1992 - 1998
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 1987 - 1992

RECENT NON-ACADEMIC EXPERIENCE
ClearSign Combustion; Electrical Aspects of Combustion, 2012 – Present
FlexEnergy; Thermal Oxidation Processes, 2009 - Present
Knobbe Martens; Engines and Combustion Patents, 2009 - Present
California State University Los Angeles; NASA and CREST Research, 2008 - Present

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
The Combustion Institute
Optical Society of America
International Association for Aerosol Research - GAeF
Society of Automotive Engineers
American Society for Engineering Education
American Institute of Aeronautics and Astronautics

RECENT HONORS AND AWARDS
Senior Member, Optical Society of America, 2011
Mechanical Engineering, Professor of the Year, Engineering Student Council, 2008-2009
Japan Society for the Promotion of Science (JSPS) Fellow, 2008
Mechanical Engineering, Professor of the Year, UCI Engineering Student Council, 2006-2007
California Alliance for Minority Participation (CAMP) Faculty Achievement Award, 2006

RECENT SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
UCI Academic Planning Group; 2010 - 2011; 2011 - 2012; 2012 - 2013
Search Committee for Vice Chancellor for Student Affairs; 2010 - 2011
Co-Director, UC Systemwide Louis Stokes Alliance for Minority Participation; 2007 - Present
UCI Regional Director of the California Alliance for Minority Participation; 1999 - Present

SELECTED SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Progress in Energy and Combustion Science, Editorial Board, 2002 - Present
Atomization and Sprays, Editorial Board, 2004- Present
International Journal of Spray and Combustion Dynamics, Editorial Board, 2008- Present
Momentum Press Sustainable Energy Series, Editor, 2009 - Present
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES
California Regional Workshop on Sustainable Accreditation Assessment Processes, 2011
Said E. Elghobashi

EDUCATION
M.Sc., Mechanical Engineering, University of Southern California, 1971
Ph.D., Mechanical Engineering, Imperial College, University of London, 1974
D.Sc., Mechanical Engineering, Imperial College, University of London, 1999

ACADEMIC EXPERIENCE
UC Irvine, Chair, Mechanical and Aerospace Engineering, 1997-2002
UC Irvine, Professor, Mechanical and Aerospace Engineering, 1985-Present
UC Irvine, Associate Professor, Mechanical and Aerospace Engineering, 1982-1985
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 1978-1982

NON-ACADEMIC EXPERIENCE
DFVLR, German Aerospace Research Establishment, Visiting Scientist, 1984-1985
Acurex Corporation, Aerotherm Division, Staff Research Engineer, 1978
CHAM, (Concentration, Heat and Momentum), Group Leader, 1974-1977

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Fellow of the American Physical Society
Fellow of the American Association for the Advancement of Science
Fellow of the American Society of Mechanical Engineers
Visiting Fellow of Cambridge University, Wolfson College, England, 1999
Senior member of the American Institute of Aeronautics and Astronautics
Member of the Combustion Institute
Member of EuroMech
Member of Fellows Selection Committee of American Physical Society, Division of Fluid Dynamics, 2009-2011
Member of Editorial Advisory Board of International J. of Multiphase Flow, 2010-2013
DIC: Diploma of Membership of Imperial College in Mechanical Engineering, 1974

HONORS and AWARDS
NASA Scientific Recognition Award, 1985

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member of search committee of new UCI Provost (2012-2013)
Member of UCI Committee on Scholarly Honors and Awards (2010-2013)
Member of UCI Committee on Courses (2007-2010)

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Guest Editor of International J. of Multiphase Flow, Special Issue on Point-particle model for disperse turbulent flows, vol. 35, 2009
Member of Editorial Advisory Board of International J. of Multiphase Flow, 2010-2014
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


S. Elghobashi \How do inertial particles modify isotropic turbulence?" International Symposium on Turbulence", [Invited Lecture], Peking University, Beijing, China, Sept. 21-25, 2009.


PROFESSIONAL DEVELOPMENT ACTIVITIES - None
Manuel Gamero-Castaño

EDUCATION
Ph.D., Mechanical Engineering, Yale University, 1999
M.S., Mechanical Engineering, Yale University, 1997
B.S., Chemical Engineering, Universidad de Sevilla, 1995

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, Mechanical and Aerospace Engineering, 2011 – Present
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 2007 - 2011

NON-ACADEMIC EXPERIENCE
Jet Propulsion Laboratory. Senior Engineer, 2004 - 2007
Jet Propulsion Laboratory, Staff Engineer, 2004 - 2004
Busek Co. Inc., Research Scientist, 1999 - 2004

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Member, American Institute of Aeronautics and Astronautics, 2000 - Present

HONORS AND AWARDS
DARPA Young Faculty Award, Defense Advanced Research Projects Agency, 2010
S. K. Friedlander Award for an outstanding Ph.D. Dissertation, American Association for Aerosol Research, 2001

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Chair, MAE Undergraduate Studies Committee, 2012 - Present
Co-Chair, MAE Undergraduate Studies Committee. 2011 - 2012
Member, MAE Undergraduate Studies Committee. 2011 - Present
Member, Subcommittee on Courses, SCOC, 2011 - Present
Coordinator, Aerospace Engineering Undergraduate Faculty Advisor and Program Lead, 2011 - Present
Organizer, MAE Department Seminar Series, 2008 - 2011

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Journal Article Reviewer., Physical Review Letters, 2011 - Present
Journal Article Reviewer, Experiments in Fluids, 2010 - Present
Journal Article Reviewer, Journal of Propulsion and Power, 2010 - Present
Journal Article Reviewer, Physics of Fluids, 2009 - Present
Journal Article Reviewer, Physics of Plasmas, 2008 - Present
Journal Article Reviewer, IEEE Transactions on Plasma Science, 2007 - Present
Journal Article Reviewer, Journal of Applied Physics, 2007 - Present
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:

PROFESSIONAL DEVELOPMENT ACTIVITIES - None
Faryar Jabbari

EDUCATION:
Ph.D. Mechanical Engineering, University of California, Los Angeles, 1986
M.S. Mechanical Engineering, University of California, Los Angeles, 1983
B.S. Mechanical Engineering, Northwestern University, 1981

ACADEMIC EXPERIENCE:
UC Irvine, Professor, Mechanical and Aerospace Engineering, 1998 - Present
UC Irvine, Associate Professor, Mechanical and Aerospace Engineering, 1992 - 1998
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 1986 - 1992
UC Los Angeles, Research and Teaching Assistant, Mechanical and Aerospace Engineering, 1982 - 1986

NON-ACADEMIC EXPERIENCE

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Institute of Electrical and Electronic Engineers (IEEE)

HONORS AND AWARDS
UCI Associate Student "Students Choice Award" in Engineering, 1998
Engineering Professor of the Year, UCI- Engineering Student Association, 2001
School of Engineering Fariborz Maseeh Faculty Teaching Award, 2005
School of Engineering Northrop-Grumman Teaching Award, 2011
Mechanical Engineering Teacher of the Year Award, 2012

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
UCI School of Engineering, Associate Dean of Academic Affairs, 2011 - Present
UCI Council on Research, Member and Chair, 1993 - 1997, 2003 - 2006
UCI Council on Academic Personnel, Member and Chair, 1998 - 2001
UCI Committee on Committees, Member and Chair, 2006 - 2009
UCI Graduate Council, Member, 2010 - 2011
UC Committee of Research Policy, Member, 2005 - 2006

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor for Automatica. 1997 - Present
Program Chair, IEEE Conference on Decision and Control, 2009
Chair, IFAC Technical Committee on Robust Control, 2008 - 2011
Program Chair, American Control Conference, 2011
Program Chair, IEEE Conference on Decision and Control, 2014
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:

PROFESSIONAL DEVELOPMENT ACTIVITIES - None
John C. LaRue

EDUCATION
Ph.D., Applied Mechanics, University of California, San Diego, 1973
M.S., Mechanical Engineering, Stanford University, 1965
B.S., Mechanical Engineering, Sacramento State University, 1964

ACADEMIC EXPERIENCE
UC Irvine, Associate Dean, Student Affairs, 1996 - Present
UC Irvine, Professor, 1998-present
UC Irvine, Associate Professor, 1981-1998
UC Irvine, Assistant Professor, 1979-1981

NON-ACADEMIC EXPERIENCE
Southern California Edison, Consultant, 1994
United States Cycling Association, Consultant, 1994

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Association for the Advancement of Science
American Institute of Aeronautics and Astronautics
American Physical Society
American Society for Engineering Education
American Society of Mechanical Engineering
Society of Automotive Engineering

HONORS AND AWARDS
ESC MAE Outstanding Faculty of the Year-2010-11, Engineering Student Council, 2010-2011
IDS Award for Contribution to Undergraduate Education, 1993-1994
Professor of the Year, School of Engineering, 1993-1994
Outstanding Teaching Award, School of Engineering, 1986-1987

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Associate Dean for Student Affairs, The Henry Samueli School of Engineering, 1996 - Present
Council on Undergraduate Admissions and Relations with Schools (CUARS), 1999 - Present
Council on Educational Policy, Subcommittee on Courses, 1997-1999
Enrollment Council, 2010 - Present
Joint JD-Engr Degree Ad-hoc Committee, 2012 - Present
MS In Engineering Management Steering Committee, 2012 - Present
Teaching Specialization Ad-hoc Committee, 2012 - Present
CSE Program Steering Committee, 2003 - Present
Accreditation Committee, 2000 - Present
HSSoE Graduate Studies Committee, 1996 - Present
HSSoE Undergraduate Studies Committee, 1996 - Present
DUE Assessment Group, 2012 - Present
WASC Oversight Committee, 2010 - Present
Undergraduate Council (previously, Chief Council of Academic Advisors), 1995 - Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
School Representative, American Society of Engineering Education, 2002 - Present
Reviewer, Journal of Fluid Mechanics, 2000 - Present
Reviewer, Journal of Fluids Engineering, 2000 - Present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES
2013 ABET Symposium, April 10-14, 2013
2012 ABET Symposium, April 18-22, 2012
Faculty Workshop on Sustainable Assessment Processes, Santa Ana, CA, Feb 12, 2011
Faculty Workshop on Assessment, April 2010
Faculty Workshop on Assessment, Phoenix, AZ, January 2008
ABET Annual Meeting, San Diego, CA, November 2005
CSE Steering Committee, UC Irvine, 2003 - Present
Accreditation Committee, The Henry Samueli School of Engineering, 1996 - Present
Robert Liebeck

EDUCATION
Ph.D., University of Illinois, Aeronautical and Astronautical Engineering, 1968
M.S., University of Illinois, Aeronautical Engineering, 1962
B.S., University of Illinois, Aeronautical Engineering, 1961

ACADEMIC EXPERIENCE
UC Irvine, Adjunct Professor, Mechanical and Aerospace Engineering, 2000 - Present
Massachusetts Institute of Technology, Professor of Practice, 1998 - Present
University of Southern California, Adjunct Professor, 1977 - 2000

NON-ACADEMIC EXPERIENCE
The Boeing Company, Senior Technical Fellow, 1997 - Present
McDonnell Douglas Corporation, Senior Fellow, 1994 - 1997
McDonnell Douglas Corporation, Principal Staff Engineer, 1983 - 1997
McDonnell Douglas Corporation, Principal Engineer, 1974 - 1983
McDonnell Douglas Corporation, Senior Engineer/Scientist, 1967 - 1974

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
AIAA
ASME
Royal Aeronautical Society
National Academy of Engineering
Academy of Model Aeronautics

HONORS AND AWARDS
ICAS Award for Innovation in Aeronautics, 2006
ASME Spirit of St. Louis Medal, 2005
AIAA Aircraft Design Award, 2005
AIAA Wright Brothers Lecture, 2002
National Academy of Engineering, 1992

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Advisor, Design Build Fly Project Group

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
National Science Foundation Engineering Research Center Site Visit Committee, 1993 – Present
National Academy of Engineering Aerospace Peer Committee, 2008 - 2009
National Academies Survey of Civil Aeronautics, 2005 - 2006
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:
AIAA Applied Aerodynamics Conference, HI, 2008
AIAA Multidisciplinary Design Conference, Canada, 2008
TsAGI 90th Anniversary Science and Technology, Russia, 2008
49th Israel Annual Conference on Aerospace Sciences, Israel, 2009

PROFESSIONAL DEVELOPMENT ACTIVITIES - None
Feng Liu

EDUCATION
Ph.D., Princeton University, Mechanical and Aerospace Engineering, 1991
M.S., Beijing Institute of Aeronautics and Astronautics, Jet Propulsion, Beijing China, 1984
B.S., Northwestern Polytechnic University, Xi’an China, 1981

ACADEMIC EXPERIENCE
UC Irvine, Professor, Mechanical and Aerospace Engineering, 2003 - Present
UC Irvine, Associate Professor, Mechanical and Aerospace Engineering 1997 - 2003
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 1991 - 1997

NON-ACADEMIC EXPERIENCE
Consulting, Zona Technologies, Scottsdale, Arizona, 2006 - Present
Consulting, Alstom Power, Baden, Switzerland, 2003 - 2004
Consulting, Stanford University, Stanford, California, 1998 - 1999
Consulting, ABB Corporate Research Center, Baden, Switzerland, 1995 - 1997
Consulting, ABB Power Generation, Baden, Switzerland, 1995 - 1997
Consulting, General Electric Aircraft Engines, Cincinnati, Ohio, 1994

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS - None

HONORS AND AWARDS
Fellow, American Institute of Aeronautics and Astronautics (AIAA), 2013
Advisory Professor, Beijing University of Aeronautics and Astronautics, 2000 – Present
Changjiang Distinguished Lecture Professor, Ministry of Education of China, 2005 - 2008
Distinguished Guest Professor, Northwestern Polytechnical University, 2003 – 2004
Guest Professor, Institute of Mechanics, the Chinese Academy of Sciences, 2003
ASEE/NASA Summer Faculty Fellowship, NASA Langley Research Center, 2001
Outstanding Professor of the Year, Class 2000, University of California, Irvine, 2000
The Grumman Prize, Princeton University, 1987

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Faculty Chair and Chair of The Executive Committee of the Henry Samueli School of Engineering, University of California, Irvine, 2007 - 2008
Director of Graduate Student Admissions, Department of Mechanical and Aerospace Engineering, University of California, Irvine, 2008 - Present
External Reviewer, Undergraduate Program Review Committee, Department of Mechanical and Aerospace Engineering, University of California, San Diego, 2013

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Member of Editorial Board, Int’l Journal of Computational Fluid Dynamics, 2008 - Present
Editor, Acta Mechanica Sinica, 2005 – Present
Associate Editor, AIAA Journal of Propulsion and Power, 2003 - Present
Member, AIAA Air-Breathing Propulsion Technical Committee, 2001 - 2005
Member, ASME Turbomachinery Technical Committee, 1997 – Present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES - None
EDUCATION
Ph.D., Rijksuniversiteit, Ghent, Belgium, Semiconductor Electrochemistry, 1978
M.S., Rijksuniversiteit, Ghent, Belgium, Physical Chemistry, 1975
B.S., Rijksuniversiteit, Ghent, Belgium, Physical Chemistry, 1973

ACADEMIC EXPERIENCE
UC Irvine, Chancellor's Professor, Mechanical and Aerospace Eng., 2002 - Present
UC Irvine, Professor, Biomedical Engineering, 2002 - Present.
UC Irvine, Professor, Chemical Engineering and Materials Science, 2002 - Present
Ohio State University, Professor, Materials, 1997 - 2000
Ohio State University, Professor, Chemistry, 1997 - 2000
UC Berkeley, Miller Visiting Professor, 1995 - 1996
Louisiana State University, Visiting Professor, 1994 - 1995
Rijksuniversiteit, Assistant Professor, 1981

NON-ACADEMIC EXPERIENCE
Microfabrication Applications Principal and Founder, 1993 – Present
NASA Ames Research Center Associate, 1994 - 2004
Vice President, Advanced Technology, Nanogen, 2001 - 2002
Director, NSF Center for Industrial Sensors and Measurements, 1999 - 2000
Vice Chairman and Founder, Teknekron Sensor Development Corporation, 1989 - 1993
Director, Microsensor Department, SRI International, 1983 - 1989
Associate Director, Microsensor Department, SRI International, 1982 - 1989

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS - None

HONORS AND AWARDS
Distinguished Visiting Honorary Professor, IIT Kanpur, 2004 - Present
Honorary Visiting Professor, IIT Kharagpur, 2007 - Present
Visiting Professor, UNIST (World Class University Scholar, WCU), 2009 - Present
Summa Cum Laude, Ph.D. Dissertation, Rijksuniversiteit, 1978

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA - None

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Conference Organizer, Session Chair and Keynote Speaker, Micro-Med-A Workshop, South Africa, 2011
Session Chair and Keynote Speaker, 7th Nanoscience and Nanotechnology Conference, Turkey, 2011
General chair, Fourth International Symposium on Dielectrics and Engineered Interfaces in Biological and Biomedical Applications, Canada, 2011
Editorial Advisory Board, Micro & Nano Systems, 2009
General chair, Third International Symposium on Dielectrics and Engineered Interfaces in Biological and Biomedical Applications, USA, 2009
Member, International Conference on Advanced Manufacturing Technologies, 2007
International Advisory Board, Analytical and Bioanalytical Chemistry, 2004-2007
Organizing committee, 1st International Conference on Micromanufacturing, USA, 2006
Organizer and General Chairman, BIO-MEMS, USA, 1999 and 2000
Regional Editor, Sensors and Actuators B, North and South America, 1999 - 2005

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:
Books:
Solid-State Physics, Fluidics, and Analytical Techniques in Micro- and Nanotechnology,
M.J. Madou, Taylor&Francis, July 2011.
Manufacturing Techniques for Microfabrication and Nanotechnology, M.J. Madou,
Taylor &Francis, July 2011.
From MEMS to Bio-MEMS and Bio-NEMS: Manufacturing Techniques and Applications, M.J.
Madou, Taylor&Francis, July 2011.
Refereed Journal Articles:
Chakraborty D, Madou M, Chakraborty, S. Anomalous mixing behaviour in rotationally
Noroozi Z, Kido H, Peytavi R, Nakajima-Sasaki R, Jasinskas A, Micic M, Felgner PL,
Madou MJ. A multiplexed immunoassay system based upon reciprocating centrifugal
Abi-Samra K, Clime L, Kong L, Gorkin R, Kim TH, Cho YK, Madou M. Thermo-
pneumatic pumping in centrifugal microfluidic platforms. Microfluidics and Nanofluidics.
June 2011.
Bisht GB, Canton G, Mirsepassi A, Kulinsky L, Oh S, Dunn-Rankin D, Madou MJ.
Controlled Continuous Patterning of Polymeric Nanofibers on 3D Substrates Using Low-
Voltage Near-Field Electrospinning, Nanoletters, March 2011; 11 (4).
Heo JI, Shim DS, Turon Teixidor G, Oh S, Shin H, Madou MJ. Carbon Interdigitated
Array Nanoelectrodes for Electrochemical Applications, Journal of the Electrochemical
Robert Gorkin, Salar Soroori, William Southard, Liviu Clime, Lawrence Kulinsky,
Horacio Kido and Marc Madou. Suction-Enhanced Siphon Valves for Centrifugal

PROFESSIONAL DEVELOPMENT ACTIVITIES - None
J. Michael McCarthy

EDUCATION
Ph.D., Mechanical Engineering Stanford University, 1979
M.S., Mechanical Engineering, Stanford University, 1975
B.S., Mechanical Engineering, Loyola Marymount University, 1974

ACADEMIC EXPERIENCE
UC Irvine, Professor, Mechanical and Aerospace Engineering, 1992 - Present
UC Irvine, Associate Professor, Mechanical Engineering, 1988 - 1992
UC Irvine, Assistant Professor, Mechanical Engineering, 1986 - 1988
Loyola Marymount University, Assistant Professor, Mechanical Eng., 1980 - 1982

NON-ACADEMIC EXPERIENCE
Chief Technical Officer, Accuray Incorporated, Sunnyvale, CA. 2001 - 2002
Senior Engineer, FMC Corporation, 1979 - 1980

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Elected Senior Member, IEEE Robotics Society, 2003
Elected Fellow, American Society of Mechanical Engineers, 2001

HONORS AND AWARDS
Mechanisms & Robotics Award, Design Engineering Division, ASME Int’l, 2011
Teaching Excellence, Undergraduate Engineering, Henry Samueli School of Eng., 2010
Mechanical and Aerospace Engineering Professor of the Year, 2010
ASME Machine Design Award, 2009
HSSOE Fariborz Maseeh Best Teaching Award, 2009
Two PROSE Awards, American Association of Publishers, Excellence in Physical Sciences & Mathematics, and Excellence in Engineering & Technology, 2009
ASME Outstanding Service Award, awarded by the ASME Design Engineering Division for service as the Editor of the ASME Journal of Mechanical Design, 2008
Outstanding Engineering Educator Award, Orange County Engineering Council, 2008
Outstanding Engineering Professor, Voted by the Senior Class, 2007
Best Paper Award, 2005 ASME Mechanisms and Robotics Conference, 2005
MDI Best Paper Award, ASME Design Engineering Technical Conferences, 2002
Faculty Speaker for the UCI Honors Convocation, 1999
AMR Unique Contribution Award, 1993

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Henry Samueli Chair & Director, Center for Eng. Science in Design, 2006 - Present
Associate Dean for Undergraduate Studies, School of Engineering, 1991 - 1992
Undergraduate Advisor, Department of Mechanical Engineering, 1989 - 1991
Secretary, Mechanical and Aerospace Engineering, 2009 - Present.
Secretary, School of Engineering, Executive Committee, 2008 - 2010
Member, Undergraduate Studies Committee, 2003 - 2009
MAE Senior Project Coordinator, 2005 - Present
Faculty Advisor, Pi Tau Sigma, Mechanical Engineering Honor Society, 2003 - Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor, Chinese Journal of Mechanical Engineering (English), 2010 - Present
Chair, Board of Governors, Southern California Section, SAE International, 2009 - 2011
Editor (founding), ASME Journal of Mechanisms and Robotics, 2008 - Present
Editor, ASME Journal of Mechanical Design, 2003 - 2008
Member, Board of Editors, American Society of Mechanical Engineers, 2003 – Present.
Associate Editor, Journal of Robotics Systems, 1993 - 2005
Chair, Honors and Awards Subcommittee, ASME Mechanisms Committee, 1998 - 2000
General Conference Chair, ASME Design Engineering Technical Conference, 1996
Conference Chair, Mechanism Conference, 1996
Chair, Mechanisms Committee, ASME Design Engineering Division 1994 - 1998
Chair, Mechanisms Committee, ASME Design Engineering Division 1994 - 1996
Member, Mechanisms Committee, ASME Design Engineering Division, 1988 - 1992
Associate Editor, ASME Journal of Mechanical Design, 1989 - 1993
Chartered Review Panel Member, National Science Foundation, 1991
Member Program Committee, IEEE Robotics and Automation Conference, 1989
Founding Editor, ASME Journal of Mechanisms and Robotics, 2007 - Present
Editor, ASME Journal of Mechanical Design, 2002 - 2007

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:

PROFESSIONAL DEVELOPMENT ACTIVITIES - None
Kenneth Mease

EDUCATION
Ph.D., Biomedical Engineering, University of Southern California 1980
M.S., Biomedical Engineering, University of Southern California, 1976
B.S., Engineering - Applied Math, University of Michigan, 1974

ACADEMIC EXPERIENCE
UC Irvine, Professor, Mechanical and Aerospace Engineering, 1999 - Present
UC Irvine, Associate Professor, Mechanical and Aerospace Engineering, 1993 - 1999
Princeton University, Assistant Professor, Mechanical and Aerospace Engineering, 1987 - 1993
California Institute of Technology, Member Technical Staff, Jet Propulsion Lab, 1980 - 1987

NON-ACADEMIC EXPERIENCE
Consultant for Universal Space Lines, LLC. 2005
Consultant for NASA, 2004 - 2005
Consultant for Guided Systems Technology, 2003 - 2004
Consultant for Boeing, 1998 - 1999
Consultant for Universal Space Lines, 1997

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS – None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Associate Fellow, American Institute of Aeronautics and Astronautics (AIAA)
Member, Society of Industrial and Applied Mathematicians (SIAM)
Member, Aerospace Controls and Guidance Systems Committee (SAE)

HONORS AND AWARDS
Boeing Distinguished Researcher and Scholar, Boeing, 2008
Fariborz Maseeh Teaching Award, UCI Henry Samueli School of Engineering, 2005
Rockwell Research Excellence Award, 1995, 1996
AIAA Associate Fellow, 1991
Princeton's Emerson Electric Faculty Advancement Award, 1989
JPL Certificate of Achievement, 1987
NASA Certificate of Recognition, 1986

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Associate Chair, Mechanical and Aerospace Engineering Department
Associate Director of the UCI Center for Engineering Science in Design; mentor for undergraduate design projects: UCI Rocket Project and Human Powered Airplane.
UCI COSMOS Summer Academy for Science and Engineering modules in Aerospace and Mechanical Engineering

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor, Journal of Optimization Theory and Applications, 2010 – present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:

PROFESSIONAL DEVELOPMENT ACTIVITIES
Dynamical Systems Workshop, Mathematical Sciences Research Institute, UC Berkeley, Jan. 2007
Dimitri Papamoschou

EDUCATION
Ph.D., Aeronautics, California Institute of Technology, 1987
M.S., Aeronautics, California Institute of Technology, 1982
B.S., Mechanical and Aerospace Engineering, Syracuse University, 1981

ACADEMIC EXPERIENCE
UC Irvine, Professor, Mechanical and Aerospace Engineering, 1998 – Present
UC Irvine, Associate Professor, Mechanical and Aerospace Engineering, 1994 – 1998
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 1998 - 1994
California Institute of Technology, Research Fellow, 1987 - 1988

NON-ACADEMIC EXPERIENCE
ATA Engineering, Consultant, 2010- 2011
Aerion Corporation, Consultant, 2008 - Present
Parker Hannifin Corporation, Consultant, 1997-98, 2009 - Present
Radiant Technology Corporation, Consultant, 1995 - 1996
Ultrasystems Engineers & Constructors, Consultant, 1992 - 1993

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Institute of Aeronautics and Astronautics
American Physical Society - Division of Fluid Dynamics

HONORS AND AWARDS
Fellow, American Institute of Aeronautics and Astronautics (AIAA), 2009
Associate Fellow, AIAA, 2002
Invited Lecture at the 48th American Physical Society / Div. of Fluid Dynamics Meeting, 1995
Stanford University Center of Turbulence Research Summer Fellowship, 1992
UCI School of Engineering Teaching Award for 1991-92

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
UC Irvine, Chair of Engineering Faculty, 2012 – present
UC Irvine, Interim Dean, School of Engineering, 2010 – 2011
UC Irvine, Acting Dean, School of Engineering, Summer 2008
UC Irvine, Associate Dean for Academic Affairs, School of Engineering, 2007 – 2010
UC Irvine, Chair, Mechanical and Aerospace Engineering, 2002 - 2005

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Member of Standards Committee for Uninstalled Jet Engine Noise Testing, U.S. Navy (2012-present)
Associate Editor, AIAA Journal (2010-present).
Administrative Chair of the 18th AIAA/CEAS Aeroacoustics Conference (2012).
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES - None
Roger H. Rangel

EDUCATION
Ph.D., Mechanical Engineering, University of California, Berkeley, 1985
M.S., Mechanical Engineering, University of California, Berkeley, 1983
Mech. Engineer, Simon Bolivar University, Venezuela, 1981

ACADEMIC EXPERIENCE
UC Irvine, Professor, Mechanical and Aerospace Engineering, 1997 - Present
UC Irvine, Chair, Mechanical and Aerospace Engineering, 2005 - 2009
Director, Balsells Fellowship Program, 1996 – Present
UC Irvine, Associate Professor, Mechanical and Aerospace Engineering, 1993 - 1997
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 1989 - 1993

NON-ACADEMIC EXPERIENCE
Avery, Inc., Adhesive Coatings, 1997
MetroLaser, Irvine, CA: Particle Trajectories During Crystal Growth, 1993
HydroAir Industries, Orange, CA: Design and Testing for Hydro Jets, 1993
STACO Switch, Costa Mesa, CA: Heat Transfer in Lighted Switch, 1992
Mitsubishi Heavy Industries, Japan: Study of Liquid Hydrogen and Liquid Oxygen Rocket Propellant Launch Hazards, 1989

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Institute of Aeronautics and Astronautics
American Society of Mechanical Engineers

HONORS AND AWARDS
Narcis Monturiol Medal, Barcelona, 2006
Generalitat de Catalunya, Spain, International Fellowship, 1999 - 2000
AIAA Microgravity Science Best Paper Award, 1999
Consiglio Nazionale delle Ricerche, Italy, International Fellowship, 1991
Organization of American States Fellowship, 1985
U.C. Berkeley's Arthur Gould Tasheira Fellowship, 1983

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA - None

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor, AIAA Journal, 2006 - 2009
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

PROFESSIONAL DEVELOPMENT ACTIVITIES - None
David J. Reinkensmeyer

EDUCATION
Ph.D., University of California at Berkeley, Electrical Engineering, 1993
M.S., University of California at Berkeley, Electrical Engineering, 1991
B.S., Massachusetts Institute of Technology, Electrical Engineering, 1988

ACADEMIC EXPERIENCE
UC Irvine, Professor, Depts. of Anatomy, Neurobiology, MAE, and BME, 2010 – Present
UC Irvine, Professor, Departments of MAE and BME, 2007 – 2010
UC Irvine, Associate Professor, Departments of MAE and BME, 2003 – 2007
UC Irvine, Assistant Professor, Dept. of Mechanical and Aerospace Engineering, 1998 – 2003
Northwestern University, Adj. Assistant Professor, Phys. Med. & Rehabilitation, 1998 – Present
Northwestern University, Research Assistant Professor, Phys. Med. & Rehab., 1997 – 1998

NON-ACADEMIC EXPERIENCE - None

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
IEEE Robotics and Automation Society
IEEE Engineering in Medicine and Biology Society

HONORS AND AWARDS
Ernst M. Guillemin Prize for Best Undergraduate Thesis in Electrical Engineering at MIT, 1988
National Science Foundation, Graduate Fellowship, 1988 – 1991
National Institute for Disability and Rehabilitation Research Training Fellow, 1994 – 1995
NIH National Research Service Award Fellow, 1995 – 1997
Sarah Baskin Award for Excellence in Research at the Rehabilitation Institute of Chicago, 1998
Whitaker Foundation Young Investigator, 1998 – 2001
Scientific Review and Evaluation Board, Department of Veterans Affairs, Rehabilitation Research Development Service, 1999 – 2000, and 2003
Chancellor's Award for Excellence in Fostering Undergraduate Research, Henry Samueli School of Engineering, 2000
Fariborz Maseeh Best Faculty Research Award, Henry Samueli School of Engineering, 2004
Ad hoc member, Musculoskeletal Rehabilitation Sciences NIH Study Section, 2008, 2011
Chair, NSF/NIH/VA WTEC International Study on Technology for Mobility, 2010 – 2012
IEEE Transactions on Neural Systems and Rehabilitation Eng., Best Paper of the Year for 2011
NIH National Institute of Biomedical Imaging & Bioengineering Plenary Lecture, Biomedical Engineering Society Annual Meeting, 2011

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Council on Educational Policy 2009 - 2010
2010, 2011, 2012 ICTS Cosmos Laboratory – Robotic Rehabilitation
2010 UCI Med School High-School Outreach Program – Robotic Rehabilitation Demos
MAE Undergraduate Studies Committee, 2008 - Current
ME ABET Coordinator, 2008 - Current
MAE Undergraduate Advisor 2009 – 2012
Calit2 Divisional Council 2012 – Current
Department of Dance Faculty Search Committee, Dance Science Assistant Prof. Positions 2013

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Chair, NSF/WTEC International Study on Technology for Mobility, 2009 - 2012
Associate Editor, IEEE Transactions on Neural Systems and Rehabilitation Eng., 2002 - 2010
NSF Workshop on Neuromechanical Engineering, Arlington, VA September 14-15, 2009;
Invited Participant, NICHD Scientific Vision Workshop on Diagnostics and Therapeutics,
Bethesda, MD March 1-2, 2011, Site Review Panel, Swiss National Science Foundation
National Centre of Excellence (NCCRs) in Intelligent Robots for Improving the Quality of Life,
2011-2016, Invited Participant, 2nd Roadmapping Workshop on US Medical and Healthcare
Robotics, sponsored by NSF and USC 2012; Conference Committee 2012 IEEE EMBS
Unconference on Rehabilitation Robotics
NIH MRS Study Section 2009, 2011; IROS 2009; Review Panel member, NSF Collaborative
Research in Computational Neuroscience Program 2010; Craig Neilsen Foundation 2011, IEEE
ICORR 2011, PLOS Computational Biology, Nature Medicine, Israeli Ministry of Sci. & Tech.

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:
overview and a feasibility study, Journal of Neuroengineering and Rehabilitation, 7:40
greedy optimization of error and effort, Journal of Neurophysiology, 97(6):3997-4006
Reinkensmeyer DJ, Patton JL (2009) Can robots help the learning of skilled actions?, Ex Sport
guidance, aging, and initial skill level on motor learning of a steering task, Exp Brain
Research, 201(2):209-20
Milot, Marie-Hélène, Marchal-Crespo L., Green CS, Cramer SC, Reinkensmeyer DJ (2009),
Comparison of error amplification and haptic guidance training techniques for learning of
a timing-based motor task by healthy individuals, Experimental Brain Research,
201(2):119-31
Klein J, Spencer SJ, Reinkensmeyer DJ (2012) Breaking it down is better: Haptic decomposition
of complex movements aids in robot-assisted motor learning, IEEE Transactions on
Neural Systems and Rehabilitation Engineering 20(3):268-75
motor recovery following stroke: optimizing corticospinal activations via reinforcement
learning can explain residual capacity and other strength recovery dynamics, Neural

PROFESSIONAL DEVELOPMENT ACTIVITIES
California Regional Workshop on Sustainable Accreditation Assessment Processes - Feb 2011
Timothy J. Rupert

EDUCATION
PhD, Materials Science and Engineering, Massachusetts Institute of Technology, 2011
MS, Mechanical Engineering, Johns Hopkins University, 2007
BS, Mechanical Engineering, Johns Hopkins University, 2007

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, 2011 - Present

NON-ACADEMIC EXPERIENCE - None

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Society of Mechanical Engineers (ASME), Member
Materials Research Society (MRS), Member
The Minerals, Metals and Materials Society (TMS), Member

HONORS AND AWARDS
Faculty Early Career Development (CAREER) Award, National Science Foundation, 2013
Broadening Participation Research Initiation Grants in Engineering (BRIGE), National Science Foundation, 2012
Graduate Research Fellowship Program, Honorable Mention, National Science Foundation, 2008
Graduate Research Fellowship Program, Honorable Mention, National Science Foundation, 2007
Charles A. Miller Award, Johns Hopkins University, 2007

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, UCI Committee on Research and Travel, 2013 - Present
Member, MAE Graduate Advisor for Recruiting and Admissions, 2013 - Present
Member, UCI Academic Senate, Council on Student Experience, 2012 - Present
Member, MAE Department Facilities Committee, September 2011 - Present
Coordinator, Seminar Series, September 2011-Present
Member, Preliminary Examination Committee in Mechanics of Solids, Materials, and Structures, July 2011 - Present
Member, Preliminary Examination Committee, Chemical Engineering and Materials Science (ChEMS), May 2012 - Present
Member, Council on Student Experience (CSE), September 1, 2012 - August 31, 2015

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Editorial Review Board Member, Metallurgical and Materials Transactions A, January 2012 - Present
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

**ARTICLES**


**PRESENTATIONS**


PROFESSIONAL DEVELOPMENT ACTIVITIES - None
Andrei M. Shkel

EDUCATION
Ph.D., Mechanical Engineering/Electrical Engineering, University of Wisconsin-Madison, 1997
M.S., Mechanical Engineering, University of Wisconsin-Madison, 1997
B.S., Mechanics & Mathematics, Moscow State University, 1991

ACADEMIC EXPERIENCE
UC Irvine, Professor, Mechanical & Aerospace Engineering, Electrical Engineering and
Computer Sciences, Biomedical Engineering, 2009 - Present
UC Irvine, Associate Professor, Mechanical & Aerospace Engineering, Electrical Engineering
and Computer Sciences, Biomedical Engineering, 2005 - 2009
UC Irvine, Assistant Professor, Mechanical & Aerospace Engineering, 2000 - 2005

NON-ACADEMIC EXPERIENCE
DARPA (MTO, DoD), Program Manager, Arlington, VA. Created/managed portfolio of
programs “Microtechnology for Positioning, Navigation, and Timing (Micro-PNT)”,
2009 - 2013
Solus Microtechnology/MEMSolutions Inc., Senior MEMS Design Engineer, Westlake Village,
CA Development of Micro-Technology for DWDM and Direct View Displays, 1999
Corporation, Solus Microtechnologies Inc., MEMSolutions Inc., VIP Sensors, Venture
Capital Firms (Fremont Venture, Silicon Valley Venture) on technical valuation of pre-
IPO companies

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Senior Member of the Institute of Electrical and Electronics Engineers (IEEE)
Member of the American Society of Mechanical Engineers (ASME)
Member of the Institute of Navigation (ION)
Member of the International Society of Optical Engineering (SPIE)

HONORS AND AWARDS
Research Achievement Award of the IEEE Sensors Council, 2009
NSF CAREER Award, 2005
Fariborz Maseeh Best Faculty Research Award, 2006
George E. Brown, Jr. Award, 2003
Gaspart de Portola Fellowship, 2002
Fellowship of the Japan Advanced Science Institute, 2001
IMAPS DPC Best Paper Award (with Prikhodko, Zotov, and Trusov), 2012
Transducers Outstanding Paper Award (with Prikhodko, Zotov, and Trusov), 2011
9th System-on-Chip Conference Best Poster Award (with Simon, Zotov, and Trusov), 2011
IEEE Sensors Best Student Paper Award (with Painter), 2002
Best Student Paper Award at the SPIE Smart Electronics and MEMS (with Max Perez), 2002
SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, UC Irvine, Faculty Recognition Committee, 2004
Member, UC Irvine, Graduate Committee, Mechanical and Aerospace Engineering, 2005 - 2006
Member, UC Irvine, Research Review Committee, 2001 - 2002

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Session Chair and co-Organizer, IEEE/ION PLANS, Myrtle Beach, 2012
Session Chair and co-Organizer, ION Joint Navigation Conference, Colorado Spring, 2012
Vice President, IEEE Sensors Council, 2008 - 2010
General Chair, IEEE Sensors Conference, Irvine, 2005
Co-Organizer, Symposium on Advances in MEMS and Optical Packaging, TMS Annual Meeting, San Diego, 2003
Vice-General Chair, Publication Chair, and Member, IEEE Sensors Conference, Toronto, 2003
Publication Chair, IEEE Sensors Conference, Orlando, 2002
Co-Chair, SPIE International Conference on MEMS and Microelectronics, Adelaide, Aust. 2001

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:

PROFESSIONAL DEVELOPMENT ACTIVITIES - None
Athanasios Sideris

EDUCATION
Ph.D, Electrical Engineering, University of Southern California, 1985
M.S., Electrical Engineering, University of Southern California, 1981
M.S., Mathematics, University of Southern California, 1986
B.S., Electrical & Mechanical Engineering, National Technical University of Athens, Greece, 1980

ACADEMIC EXPERIENCE
UC Irvine, Professor, The Henry Samueli School of Engineering, 1998 - Present
UC Irvine, Associate Professor, The Henry Samueli School of Engineering, 1993 - 1998
UC Irvine, Assistant Professor, The Henry Samueli School of Engineering, 1992 - 1993
Caltech, Assistant Professor, Electrical Engineering Department, 1986 - 1992

NON-ACADEMIC EXPERIENCE
Jet Propulsion Laboratory, Faculty Fellow, 2012 – 2013

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
IEEE, Control Systems society, 1980 - Present

HONORS AND AWARDS

SERVICE ACTIVITIES inside UNIVERSITY OF CALIFORNIA, IRVINE
UC Irvine, Mechanical Systems & Design Section Head, Academic Year 2001-02
UC Irvine, Representative of the Department of Mechanical and Aerospace Engineering to the School of Engineering Executive Committee, 2003
UC Irvine, ABET lead person for Mechanical Engineering Program, 2005 - 2007
UC Irvine, Undergraduate Advisor for Mechanical Engineering Program and Chair of Undergraduate Studies Committee for Mechanical and Aerospace Engineering Department, 2005-2007
UC Irvine, Member of Campus-wide Committee on Privilege and Tenure, 2005 - 2006
UC Irvine, Graduate Advisor for Mechanical Engineering Program and Chair of Graduate Studies Committee for Mechanical and Aerospace Engineering Department, 2007 - 2010

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA, IRVINE
Associate Editor for the International Journal of Robust and Nonlinear Control, 1993 - Present
Member of International Program Committee ROCOND 2009, 2012
Reviewer for the National Science Foundation, Department of Energy, University of California
SELECTED PUBLICATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES - None
William A. Sirignano

EDUCATION
Ph.D., Aerospace and Mechanical Science, Princeton University, 1964
M.S., Aerospace and Mechanical Science, Princeton University, 1962
B.S., Aerospace Engineering, Rensselaer Polytechnic Institute, 1959

ACADEMIC EXPERIENCE
UC Irvine, Professor, Mechanical and Aerospace Engineering, 1985 - Present
UC Irvine, Henry Samueli Endowed Chair in Engineering, 2004 - Present
UC Irvine, Dean, School of Engineering, 1985 -1994
Carnegie-Mellon University, George Tallman Ladd Professor & Dept. Head, 1979 - 1984
Princeton University, Prof. 1973 – 79; Assoc. Prof. 1969 –73; Asst. Prof. 1967 – 69.

NON-ACADEMIC EXPERIENCE
Grumman Aircraft Engineering Corp., Apprentice Engineer (Summer Employee)
Research Department, 1959
United Technologies Research Center, United Aircraft Research Fellow, 1973 – 1974

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Fellow: AIAA, APS, ASME, AAAS, Soc. for Industrial & Applied Math, and Institute
for the Advancement of Engineering
Member: ASEE, Combustion Institute, SAE, and Sigma Xi
Committees: Army Research Labs NRC Panel on Mechanical Science and Engineering,
Microgravity Research Committee of Space Studies Board, National
Research Council; Formerly, Chair, Academic Advisory Council, Industrial Research
Institute; NASA Space Science and Applications Advisory Committee; AIAA
Publications Committee and Journal Subcommittee; Chairman, AIAA Solid Rockets
Technical Committee; Executive Committee, Board of Directors, and Treasurer, The
Combustion Institute; President, Institute of the Dynamics of Explosions and Reactive
Systems.
Editorships: Series Editor, Combustion Science and Technology, Taylor & Francis. Editorial
Advisory Boards: Combustion Science and Technology, Combustion & Flame,
Journal of Propulsion & Power, Atomization and Sprays, Progress in Energy and
Combustion Science, Archivum Combustionis.

HONORS AND AWARDS
AIAA Wyld Propulsion Award, 2009
AIAA Sustained Service Award, 2006
AIAA Energy Systems Award, 2004
National Academy of Engineering, 2002
Alfred C. Egerton Gold Medal, The Combustion Institute, 1996
American Electronics Association, Orange County Council, 1994
IDERS Oppenheim Award, 1993
UC Irvine Alumni Distinguished Research Award, 1992
AIAA Propellants and Combustion National Award, 1992
ASME Freeman Scholar Award, 1992
AIAA Pendray Aerospace Literature Award, 1991
United Aircraft Research Fellow, 1973 - 1974

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
UC Irvine, Dean of the School of Engineering, 1985 – 1994
Chair, Universitywide Committee on Planning and Budget, 1999-2000; Member, 97-00.

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Member, Editorial Advisory Board, Atomization and Sprays, 1989-2007
Member, Editorial Advisory Board, Archivum Combustionis, 1992 - Present
Member, Editorial Advisory Board, Combustion and Flame, 2000-2008
Member, Editorial Advisory Board, Journal of Propulsion and Power, 2004 - Present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:

PROFESSIONAL DEVELOPMENT ACTIVITIES
Research and Consulting
Lorenzo Valdevit

EDUCATION
Ph.D., Mechanical and Aerospace Engineering, Princeton University, 2005
M.A., Princeton University, 2002
M.S., Materials Engineering, University of Trieste, Italy, 2000

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 2007 - Present
UC Irvine, Assistant Professor, Chemical Engineering and Materials Science, 2008 - Present
Cornell University, Visiting Scientist, Applied and Engineering Physics Department, 2005-2007

NON-ACADEMIC EXPERIENCE - None

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
The Minerals, Metals and Materials Society, 2012 - Present
American Institute of Aeronautics and Astronautics, 2005 - Present
Materials Research Society, 2003 - Present
American Society of Mechanical Engineers, 2002 - Present

HONORS AND AWARDS
Breakthrough Award, Popular Mechanics, 2012
Outstanding Engineering Educator Award, Orange County Engineering Council, 2012
Eminent Engineer Member, Tau Beta Pi Engineering Honors Society, 2009
IBM Faculty Award, IBM Corporation, 2007
Invited participant, NAE – von Humboldt Foundation, 2009

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, MAE Graduate Studies Committee, 2009 - 2011
Member, MAE Undergraduate Studies Committee, 2007 - 2011
Member, Preliminary Examination Committee in Mechanics of Solids, Materials and Structures, 2011 – 2012
Member, MAE Faculty Search Committee, 2010 - 2011
Member, MAE Faculty Search Committee, 2009 - 2010
Chief Faculty Advisor, Tau Beta Pi Engineering Honors Society, California Tau Chapter, 2009 – Present
Member, Preliminary Examination Exam in ChEMS and CEE, 2008 – Present
Member, Laboratory for Electron and X-Ray Instrumentation (LEXI) Faculty Oversight Committee, 2012 – Present
Member, Academic Senate Board on Undergraduate Scholarships, Honors and Financial Aids, 2012 – 2013
Alternate Member, Academic Senate Divisional Representative to the University-Wide Assembly, 2010 – 2012

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Co-organizer and co-chair for session ‘Optimal Design of Structures’, ASME IMECE, 2009
Organizer and Chair for session ‘Smart Materials and Structures’, ASME IMECE, 2008, 2009
Co-chair for session ‘Advanced Topics in Metallurgy’, ASME IMECE, 2004
Member, ASME Multifunctional Materials Technical Committee, 2007 - 2009

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:

PROFESSIONAL DEVELOPMENT ACTIVITIES - None
Yun Wang

EDUCATION
PhD, Mechanical Engineering, The Pennsylvania State University, 2006
Masters, Mechanical and Engineering Science, Peking University, China, 2001
Bachelors, Mechanical and Engineering Science, Peking University, China, 1998

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, Mechanical and Aerospace Engineering, 2012 - Present
UC Irvine, Assistant Professor, Mechanical and Aerospace Engineering, 2006 - 2012

NON-ACADEMIC EXPERIENCE - None

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Electrochemical Society (ECS)
American Society of Mechanical Engineers (ASME)
American Society of Engineering Education (ASEE)

HONORS AND AWARDS
Outstanding Engineering Educator Award: Orange County Engineering Council, 2010

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Committee member of CORCLR Research and Travel Grant, 2007 - 2012
Departmental Seminar Series Organizer, 2007 - 2011
Chair of CORCLR Research and Travel Grant, 2009
Committee member of MAE Undergraduate Study Committee, 2009 - 2012
Faculty Moderator at the 2010 UCI Undergraduate Research Symposium, 2010 - 2011

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Session co-chair at ASME Int. Mechanical Engineering Congress & Exposition, 2009
A keynote talk at the ASME 3rd Energy Nanotechnology Int. Conference, 2008
Co-chair of International Conference on Modeling, Simulation and Control, 2007
Committee member of International Conference on Chemical Engineering, 2007
Panel reviewer for the UC Discovery Grant’s Pilot Project proposals, 2007
NSF Pre-Proposal reviewer for the ERC Sustainable Energy Sys.-Generation, 2007
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES - None
Gregory Washington

EDUCATION
Ph.D, Mechanical Engineering, North Carolina State University, 1994
M.S., Mechanical Engineering, North Carolina State University, 1991
B.S., Mechanical Engineering, North Carolina State University, 1989

ACADEMIC EXPERIENCE
UC Irvine, Dean, The Henry Samueli School of Engineering, 2011 - Present
Ohio State University, Interim Dean, College of Engineering, 2008 - 2011
Ohio State University, Professor, College of Engineering, 2004 - 2011
Ohio State University, Associate Professor, College of Engineering, 2000 - 2004
Ohio State University, Assistant Professor, College of Engineering, 1995 - 2000

NON-ACADEMIC EXPERIENCE
National Aeronautics and Space Administration, Research assistant, 1990
Ford Motor Company, Research Scientist, 1995
National Aeronautics and Space Administration, Summer Faculty Fellow, summers 1997, 98, 99
Air Force Research Laboratory, Summer Faculty Program, summers 2001, 02, 03, 04
Sandia National Laboratory, Research Scientist, 2004-2005

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
ASME, 1998 - Present

HONORS AND AWARDS
Lumley Research Award, 1999-2000, 2002, 2005, Harrison Faculty Award for Excellence in
Engineering Education (2005), National Academy of Engineering–Frontiers in Engineering
(Invitee) (2004), University Award for Distinguished Teaching (2002), OSU Teaching Academy
Excellence in Teaching Award (1998-1999), College of Engineering Annual Research
Accomplishment Award (1998), OSU Engineering Advisor of the Year (1998), National Science
Foundation CAREER Award (1997), NASA Summer Faculty Fellow (1997-1999), Dupont
Young Investigator Award (1998-2000), Ameritech Faculty Fellowship (1996), DuPont Aid to
Education Grant (1995, 1996), OSU Outstanding Faculty Nomination (1996), Wake County
Black Achiever of the Year (1993), Phi Kappa Phi Honor Fraternity (1992), Featured in Ebony
Magazine as one of the top ten African American students in the USA (Aug. 1990)

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA – None

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Conference General Chair, ASME-Adaptive Structures and Material Systems Symposium, 1999
Technical Review Panel: NSF Civil and Mechanical Systems Division, SBIR, NSF Civil and Mechanical Systems Division, CAREER
Session Chair, ASME International Congress & Exposition, 1996-2007
Technical Committee Member, Adaptive Structures and Material Systems, Aerospace Division, ASME 1998 - present
Advisor, National Society of Black Engineers (OSU Chapter), OSU FutureCar Team, OSU FutureTruck Team, 2000-2001

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:

PROFESSIONAL DEVELOPMENT ACTIVITIES
ABET Faculty Workshop on Sustainable Assessment Processes, Baltimore, MD, May 2007
NAME: Amir AghaKouchak

EDUCATION
PhD, Civil and Environmental Engineering, University of Stuttgart, 2010
MSc., Civil Engineering (Major: Water Resources), K.N. Toosi University of Technology, 2005
BS, Civil Engineering (Major: Water Resources), K.N. Toosi University of Technology, 2001

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, 2011-Present
UC Irvine, Postdoctoral Scholar, 2010-2011
UC Irvine, Assistant Specialist, 2009-2010
University of Stuttgart, Graduate Student, September 2006-February 2010
University of Louisiana at Lafayette, Visiting Scholar, January 2008-September 2009

NON-ACADEMIC EXPERIENCE

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS
Professional Licensed Civil Engineer in the State of California, License Number: 78586, 2011-Present

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Society of Civil Engineers (ASCE), 2011-Present
American Geophysical Union (AGU), 2008-Present

SELECTED HONORS AND AWARDS
2012 Frontiers of Engineering Education (FOEE), National Academy of Engineering (NAE), 2012

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, CEE Graduate Committee, August 2012-Present
Co-Coordinator, Environmental Engineering Seminar Series, October 2011-Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Editor, Extremes in a Changing Climate, March 2012 - Present
Member, NOAA Drought Task Force, November 2011 - Present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


N. Nasrollahi, A. Aghakouchak, J. Li, X. Gao, K. Hsu, S. Sorooshian, "Assessing the impacts of different WRF parameterization schemes in hurricane modeling", Weather and Forecasting, August 2012.


NAME: William J. Cooper

EDUCATION
Ph.D., Marine and Atmospheric Chemistry, University of Miami, Miami, FL, 1987
M.S., Fuel Science (Organic Geochemistry), Pennsylvania State University, University Park, PA, 1971
B.S., Chemistry, Allegheny College, Meadville, PA, 1969

ACADEMIC EXPERIENCE
University of California, Irvine, Professor, Department of Civil and Environmental Engineering, and Director, Urban Water Research Center, Henry Samueli School of Engineering, 2006-present
University of North Carolina at Wilmington, Professor (and Chair 1997 to 2000), Department of Chemistry, 1997 - 2006
Florida International University, Associate Professor, Department of Chemistry (1992-1997)
Florida International University, Research Professor, Drinking Water Research Center, College of Engineering (1996 1997)
Florida International University, Associate Research Professor, Director (1982-1996), Drinking Water Research Center, College of Engineering (1980 – 1996)

NON-ACADEMIC EXPERIENCE
Department of the Army Civilian with the U.S. Army Medical Bioengineering R & D Laboratory, Environmental Protection Research Division, Ft. Detrick, Frederick, MD (1974 – 1980)

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS:
American Academy of Environmental Engineers and Scientists, Board Certified Environmental Scientist

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Chemical Society, 1970-present
American Water Works Association, Life Member (>30 years)
Sigma Xi, 1970-present
American Geophysical Union
American Society of Limnology and Oceanography

HONORS AND AWARDS
Elected Fellow of the American Association for the Advancement of Science (AAAS) 2011.
UCI, Engineering Student Council, Civil and Environmental Engineering Professor of the Year (2011)
Distinguished Service Award, Association of Environmental Engineers and Science Professors (2011)

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA (2011-2012)
Cooper, W. J. Environmental Engineering Perspective on Graduate School, for students from Morehouse and Spelman Colleges, sponsored by UCI Graduate Division, Outreach, Recruitment and Retention Office, UCI Student Center, March 6, 2012.
Cooper, W. J. “Water: The Looming Global Crisis,” presented as the opening lecture for a series entitled “Global Water: A Looming Crisis” for the UCI Osher Lifelong Learning Institute (OLLI), Nov. 11 2011.
SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Chair, International Water Association Specialty Conference; Natural Organic Matter: From Source to Tap and Beyond, Hilton Orange County, Costa Mesa, CA, July 27-29, 2011.

SELECTED PUBLICATIONS from 2012 out of 193 total publications:


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME: Kristen A. Davis

EDUCATION
Ph.D., Civil and Environmental Engineering, Stanford University, 2009
M.S., Civil and Environmental Engineering, Stanford University, 2004
B.S., Environmental Engineering Sciences, University of Florida, 2000

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, The Henry Samueli School of Engineering, 2012-present
University of Washington, Research Associate, Applied Physics Laboratory, 2010-2012
Woods Hole Oceanographic Institution, Postdoctoral Scholar, Phys. Oceanography, 2009-2010

NON-ACADEMIC EXPERIENCE
W. Alton Jones Foundation, Research Assistant, Charlottesville, VA, 2001

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS
American Academy of Underwater Scientists, Scientific Diver, 2003-present

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Geophysical Union, 2006-present
Association for the Sciences of Limnology and Oceanography, 2007-present

HONORS AND AWARDS
Woods Hole Postdoctoral Scholarship, 2009-2010
Achievement Rewards for College Scientists (ARCS) Fellowship, 2007-2008
John K. Vennard Civil Engineering Fellowship, 2002
University of Florida Undergraduate Research Scholarship, 1999
Wentworth Scholarship Award, 1997

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA – none

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Session Organizer Ocean Sciences Meeting 2012, “Physical and Biogeochemical Dynamics of Density Fronts, Bores & Gravity Currents”.
Student Supervision Co-advised a Master’s student at Stanford University.
Professional Membership American Geophysical Union, American Society of Limnology and Oceanography, American Association for the Advancement of Science, American Academy of Underwater Sciences.
Professional Certification Engineer Intern Certification (passed the Fundamentals of Engineering Exam in the State of Florida, 2000, #1100006633)

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES
Ocean Carbon and Biogeochemistry Project Ocean Acidification Short Course, Woods Hole, MA, November 2009.
NAME: Russell L. Detwiler

EDUCATION
PhD, Civil Engineering, University of Colorado, 2000
BS, Civil Engineering, University of Vermont, 1988

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, 2008-2011
University of Colorado, Research Associate, Civil, Environmental, and Architectural Engineering Department, December 2000-November 2001
University of Colorado, Research Assistant, Civil, Environmental, and Architectural Engineering Department, September 1995-December 2000

NON-ACADEMIC EXPERIENCE
Lawrence Livermore National Laboratory, Deputy Group Leader, Experimental Geophysics Group, November 2007-August 2008
Lawrence Livermore National Laboratory, Staff Scientist, Experimental Geophysics Group, November 2001-November 2007
Timmerhus, Inc., Project Manager, September 1992-September 1995
GEO Engineering, Inc., Project Engineer, June 1990-September 1992
Wagner, Heindel, and Noyes, Inc., Assistant Engineer, January 1987-May 1988

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Society of Civil Engineers, 2007-Present
American Geophysical Union, 1996-Present

HONORS AND AWARDS
Best Paper Award, American Rock Mechanics Association, June 2010
Best Paper Award, Geothermal Resources Council, San Diego, California, September 2006

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Advisor, American Academy of Environmental Engineers, Student Chapter, May 2011-Present
Advisor, Engineers Without Borders, Student Chapter, January 2010-Present
Lead Faculty, ABET - Environmental Engineering Program, January 2009-Present
Member, Undergraduate Affairs Committee, September 2008-Present
Advisor, Environmental Engineering Undergraduate Program, January 2009-September 2011

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Chair, American Geophysical Union, Hydrology Section Unsaturated Zone Committee, December 2009 - Present
Reviewer, Pacific Northwest National Laboratory, Environmental Molecular Sciences Laboratory External Review Panel, October 2009 - Present
Member, American Geophysical Union, Hydrology Section Unsaturated Zone Committee, December 2005 - Present
Organizer, Session at Fall Meeting of American Geophysical Union - H12A, H13C: Geologic CO2 Sequestration: Capillary and Solubility Trapping of Supercritical CO2, December 13, 2010 - December 17, 2010
Organizer, Session at Fall Meeting of American Geophysical Union - H33E: Environmental Vadose Zone Hydrology Posters, December 13, 2010 - December 17, 2010
Reviewer, US Department of Energy, Early Career Award Review Panel, November 2010
Reviewer, US DOE, Idaho National Laboratory, External review panel, June 8, 2010 - June 9, 2010
Co-Chair, American Geophysical Union, Hydrology Section Unsaturated Zone Committee, December 2007 - December 2009
Organizer, Session at Fall Meeting of American Geophysical Union - H13E: Integrity of CO2 Sequestration Reservoirs: Mechanics Controlling Subsurface Trapping of CO2 and CO2 Flow within Fractures, Faults and Wellbore Interfaces, December 14, 2009 - December 18, 2009

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


Invited Presentations


PROFESSIONAL DEVELOPMENT ACTIVITIES
ABET Faculty Workshop on Sustainable Assessment, Santa Ana, California, February 12, 2011.
NAME: Xiaogang Gao

EDUCATION
Ph.D., Hydrology and Environmental Engineering, University of Arizona, 1993
M.S., Mechanical Engineering, Dong-Wu University, China, 1981
B.S., Mechanical Engineering, Dong-Wu University, China, 1965

ACADEMIC EXPERIENCE
UC Irvine, Adjunct Professor, Henry Samueli School of Engineering, 2009-present
UC Irvine, Adjunct Associate Professor, Henry Samueli School of Engineering, 2003-2009
University of Arizona, Associate Professor, College of Engineering, 2000-2003
University of Arizona, Assistant Professor, College of Engineering, 1993-2000
University of Arizona, Research Assistant, Ph.D. Graduate Student, 1990-1993
University of Connecticut, M.S. Graduate Student, 1985-1990
Dong-Wu University, China, Associate Professor, Department of Basic Science, 1983-1985
Dong-Wu University, China, Assistant Professor, Department of Basic Science, 1981-1983
Dong-Wu University, China, M.S. Graduate Student, Department of Basic Science, 1978-1981

NON-ACADEMIC EXPERIENCE
Wu-Han Light-Industry Institute, Engineer, 1976-1978
Yi-Chan Textile Mechanical Factory, Engineer, 1969-1976

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Geophysical Union (AGU) 1993-present
American Meteorology Society (AMS) 1995-Present
Chinese Eng. Society (CES) 1981-present

HONORS AND AWARDS
NASA Graduate Fellowship, 1990-1993

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Advisor for graduate students
Committee member for graduate preliminary and qualifying examinations

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


**PROFESSIONAL DEVELOPMENT ACTIVITIES**-none
NAME: Stanley B. Grant

EDUCATION
PhD, Environmental Engineering & Science, California Institute of Technology, 1992
MS, Environmental Engineering & Science, California Institute of Technology, 1990
BS, Geology, Stanford University, 1985

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2001-2010
UC Irvine, Associate Professor, 1997-2001
UC Irvine, Assistant Professor, 1991-1997
University of Melbourne, Chair Professor of Hydrology and Water Resources, Summer Appointments, June 15, 2010-Present

NON-ACADEMIC EXPERIENCE
Unocal Corporation, Seismic Analyst, January 1985-August 1987
US Environmental Protection Agency, California, Consultant, Reviewed a report authored by EPA., October 5, 2010-October 7, 2010
California State Water Board, California, Consultant, Provided analysis of water quality data., May 25, 2010-June 10, 2010
Los Angeles County, Los Angeles, Consultant, provided expert analysis of a lawsuit filed against LA County by the Natural Resources Defense Council, April 14, 2009-December 3, 2009
California State Water Board, California, Consultant, Provided analysis of water quality data., March 8, 2009-October 27, 2009
City of Avalon/Calif State Water Board, California, Consultant, Provided analysis of water quality data., January 1, 2008-December 30, 2008
City of Avalon/California State Water Board, California, Consultant, Provided analysis of water quality data., June 18, 2007-December 21, 2007

HONORS AND AWARDS
Croucher Lecture, University of Hong Kong, Hong Kong (China), May 11, 2010
Appreciation Award, Graduate Student Association, ChEMS, UCI, 2009
Member, Science Advisory Board, U.S. EPA (Drinking Water Panel), 2002-2009
Croucher Lecture, University of Hong Kong Advanced Study Institute on Nearshore Coastal Water Quality Research, Hong Kong (China), December 14, 2009
Chancellor's International Lecture, Univ. Melbourne, Victoria (Australia), September 3, 2009
Grand Rounds Lecture, UCI Medical School, Irvine, CA, October 24, 2007
Finalist, Dean of Engineering, College of Engineering, Univ. of Hawaii (Manoa Campus), 2006
Conservator of the Year, Bolsa Chica Conservancy (with commendations from City of Huntington Beach, County of Orange, California Legislature, California Senate, and US Congress), 2002
Honorary Member, Golden Key International Honor Society, 2001
W.M. Keck Fellow Award, Chapman University, 2000
National Science Foundation Early Career Award, July 1995-June 2000
Distinguished Assistant Professor Award for Teaching, UCI Academic Senate, 1998
Outstanding Assistant Professor Award, School of Engineering, UC Irvine, 1994
Most Outstanding Professor, School of Engineering Senior Undergraduates, UC Irvine, 1993

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Department Chairperson, Dept. of Chemical Engineering and Materials Science, September 2002-June 2009
Chair, Chemical Engineering Curriculum Committee, January 1, 2011-July 1, 2011
Chair, Department of Chemical Engineering and Materials Science, 2002-2009

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Reviewer for top journals (Environmental Science and Technology, Water Resources Research, Water Research) and funding agencies (National Science Foundation, U.S. Environmental Protection Agency, Sea Grant)

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


NAME: Kuolin Hsu

EDUCATION
M.S., Agricultural Engineering, National Taiwan University, 1986.

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor in Residence, Civil & Environ. Engineering, 2012-present
UC Irvine, Associate Adjunct Professor, Civil & Environ. Engineering, 2007-2012
UC Irvine, Assistant Adjunct Professor, Civil and Environ. Engineering, 2003-2007

RESEARCH ACTIVITIES
Hydrologic modeling and water resources systems management
Bayesian Monte Carlo and Multi-model ensemble methods in hydrologic applications
Multiple satellite observations for global precipitation measurement
Remote sensing data for hydrologic applications

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
CEE Dept. Undergraduate/graduate student recruitment: CHRS Lab. Tour, 2010-present
Committee member: graduate student preliminary/qualifying exams, 2004-present
Graduate Student Advisor: 2004-present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Editor, Data Papers in Geosciences, 2012-present
Associate Editor, Water Resources Research, 2011-present
Associate Editor, Journal of Hydrometeorology, 2008-present
Member, NOAA GOES-R Satellite Mission hydrology working group, 2007-present
Member, NASA Global Precipitation Measurement Mission (PMM) hydrology working group, 2010-present
Member, NASA PMM multi-satellite precipitation analysis working group, 2010-present
Session Chair, High-resolution Multi-Sensor Precipitation Estimation and Validation: Recent Advances and User Perspectives, AGU Fall Meeting, San Francisco, CA, 5-9, December, 2011.
Session Chair, Emerging Computational and Optimization Approaches for Hydro-Environmental Systems Modeling and Management, AGU Fall Meeting, San Francisco, CA, 13-17, December, 2010.

SELECTED PUBLICATIONS (60+ publications in peer reviewed journals)

Bae, H.K, B.H. Olson, K. Hsu, and S. Sorooshian, Identification and Application of Physical and Chemical Parameters to Predict Indicator Bacterial Concentration in a Small California Creek, Water and Environmental Research, 81(6), 633-640, 2009.


NAME: R. Jayakrishnan

EDUCATION
PhD, Civil Engineering, University of Texas at Austin, 1992
M.S.E, Civil Engineering, University of Texas at Austin, 1987
B.Tech, Civil Engineering, Indian Institute of Technology at Madras, 1985

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2011-2012
UC Irvine, Associate Professor, 1997-2011
UC Irvine, Assistant Professor, 1991-1997
UC Irvine, Assistant Acting Professor, 1991

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Society of Civil Engineers (ASCE), 1991-Present
Institute of Operations Research and Management Science (INFORMS), 1991-Present
Institute of Transportation Engineers
Transportation Research Board (TRB), Chair of subcommittee on Route Choice and Spatio-Temporal Behavior, 2008-Present
Chi Epsilon Civil Engineering Honor Society, Student Chapter Faculty Advisor, 1996-2009

HONORS AND AWARDS
Pyke Johnson Award for the Best Paper in Transportation Planning, TRB, January 2010
Outstanding Professor (Civil & Env. Engineering), Engineering Students Council, UCI, 2008
Outstanding Assistant Professor, Dept. of Civil Engineering, 1996

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Chair, Ad-Hoc committee on UG student retention, January 2010-2011
Advisor, ITE (Institute of Transportation Engineers) Student Chapter, Oct 2006-Sep 2010
Chair, Undergraduate Recruiting Committee, July 2001-June 2010
Advisor, Chi Epsilon (Civil Eng. Honor Society) Student Chapter, Oct 1995-Sep 2009
Member, Graduate Studies Committee, October 2012-Present
Fac. Advisor, SPICMACAY Student Chapter (Music/Cultural) Organization, Jan 2006-Present
Executive Committee of Cal-IT2, Member, October 2003-Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Editorial Review Board Member, Transportation Research Record, TRB, Aug 2008 - Present
Organizer, TRB Subcommittee on Route Choice and Spatio-Temporal Behavior, 2008 - Present
Reviewer, Ad Hoc, Transportation Science; Transportation Research (Parts A,B,C); ASCE
Journal of Transportation Engineering; Operations Research; ITS Journal; Transportation Research Record; Network and Spatial Economics; Computers Applications in Civil and Infrastructural Engineering
Chair, INFORMS Award Committee for Best Dissertation in Transportation, Jan - Dec 2010
Organizer, 12th World Congress on Transportation Research, Lisbon, Portugal, July 2010
Organizer, Conference on Innovations in Travel Modeling (ITMC), Tempe, AZ, May 2010
Reviewer, Extramural Funding, Federal Highway Admin. Project Review Panel, March 2010
Session Chair, 89th Annual TRB Meeting, Washington, DC, January 2010
Workshop Co-chair, 12th Int. Conference on Travel Behavior Research, Jaipur, India, Dec 2009
Member, INFORMS Award Committee for Best Dissertation in Transportation, 2008-2009
Session Chair, 88th Annual TRB Meeting, Washington, DC, January 2009
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

**Articles, Journal**


**Conference/Workshop/Symposium Proceedings**


**Reports, Research**


**Presentations**

NAME: Chenyang S. Jiang

EDUCATION
BS, Biochemistry, Nankai University, 1989
MS, Marine Science, University of South Florida, 1993
PhD, Marine Science, University of South Florida, 1996
Postdoctoral Fellow, University of Maryland

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2010-Present
UC Irvine, Associate Professor, 2004-2010
UC Irvine, Assistant Professor, 1998-2004
The Center of Marine Biotechnology, University of Maryland Biotechnology Institute, Postdoctoral Research Associate, 1997-1998
University of South Florida, Graduate Research assistant, Marine Science, 1990-1996

NON-ACADEMIC EXPERIENCE

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Society of Limnology and Oceanography, 1995-Present
American Society for Microbiology, 1991-Present

HONORS AND AWARDS
Excellence in Teaching, Division of Undergraduate Education, UC Irvine, 2002
Chancellor’s Award for Excellence in Undergraduate Students Research Mentoring, UC Irvine, 2001
Environmental Project Award, Environmental Professionals Organization, Southern California, 2001

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Director, Environmental Engineering Graduate Program, July 1, 2010-Present
Member, Geotechnical Engineering Search Committee, September 2010-February 2011
Member, Dean's Search Committee, September 2010-February 2011
Advisor, Green Campus Faculty Advisory Group, February 2010-June 2012
Member, Library Task Force, January 2010-June 2010

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Member, National Water Research Institute, Independent Advisory Board for San Diego Water Replenishment Project, May 2009 - Present
Member, National Research Council Committee on Water Reuse, December 2008 - December 2011
Reviewer, Extramural Funding, Washington Sea Grant proposal review panel, August 2009
Member, WHO Desalination Guideline Development Committee, October 2004 - 2006
Member, EPA Review Board-Microbial Risk of Drinking Water, November 2003

SELECTED PUBLICATIONS AND PRESENTATIONS


S. C. Jiang, J. Han, J. He, W. Chu, "Evaluation of four cell lines for assay of infectious adenoviruses in water samples", *Journal of Water and Health*, vol. 7, pp. 650-656 2009.
NAME: Wenlong Jin

EDUCATION
PhD, Applied mathematics, University of California, Davis, 2003
MS, Applied mathematics, University of California, Davis, 2000
BS, Automation, University of Science and Technology of China, 1998

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, 2007-Present
UC Irvine, Postdoctoral Scholar, 2003-2006
University of Science and Technology of China, Associate Professor (Non-tenure track), March 2006-April 2008

HONORS AND AWARDS

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, CEE Undergraduate Affairs, July 2010-Present
Coordinator, Faculty Lead for Civil Engineering ABET Accreditation, July 2010-Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor, Transportmetrica B: Transport Dynamics, July 12, 2012 - Present
Associate Editor, IEEE ITS Conference, January 25, 2010 - Present
Editorial Review Board Member, Transportation Research Part B, April 1, 2009 - Present
Panelist, CUTC Neville Parker Award, 2008 - Present
Editorial Review Board Member, The Open Transportation Journal, 2007 - Present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


*Conference/Workshop/Symposium Proceedings*


**PROFESSIONAL DEVELOPMENT ACTIVITIES**


Workshop, ABET faculty workshop, ABET.org, February 12, 2011

Self-Study Program, UC Ethical Values and Conduct, and Conflict of Interest for Researchers, UCI Conflict of Interest Administrator, July 21, 2010

Self-Study Program, UC Training Requirement - Harassment Prevention, Office of Equal Opportunity and Diversity, May 3, 2009

Workshop, Career Advising Workshop, UCI ADVANCE Program, October 23, 2008
NAME: Anne Lemnitzer

EDUCATION
PhD, Structural/Earthquake Engineering, University of California, Los Angeles, 2009
MS, Structural/Earthquake Engineering, University of California, Los Angeles, 2007
MS, Geotechnical Engineering, California State University Long Beach, 2005
BS, Structural Engineering, University of Applied Sciences, Leipzig, Germany, 2004

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, 2011-Present
California State University, Fullerton, Assistant Professor, August 18, 2009-August 17, 2011

NON-ACADEMIC EXPERIENCE

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS
EIT, Board of Professional Engineers and Land Surveyors, April 21, 2007-Present

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Deep Foundation Institute, October 1, 2010-Present
American Society of Civil Engineers, October 1, 2007-Present
Earthquake Engineering Research Institute, Board Member, Student Activities Committee, February 1, 2007-Present

HONORS AND AWARDS
2011 Young Professors Research Paper Award, Deep Foundations Institute, October 2011-Present

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Attendee, CEE Affiliates, August 2011-Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Reviewer, Ad Hoc, ASCE Journal of Structural Engineering, November 2011 - Present
Member, Seismic and Lateral Loads Committee, Deep Foundation Institute, February 2011 - Present
Reviewer, Ad Hoc, Earthquake Spectra, September 2010 - Present
Reviewer, Ad Hoc, DFI Journal, March 2010 - Present
Member, Student Activities Committee at the Earthquake Engineering Research Institute, October 2009 - Present
Reviewer, Ad Hoc, ASCE Journal of Geotechnical Engineering, June 2007 - Present
Judge for the Geotechnical Design Competition, PSWC (Pacific South West Competition), ASCE, March 22, 2012 - March 24, 2012

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

*Articles, Journal*

*Conference/Workshop/Symposium Proceedings*


**Presentations**


**PROFESSIONAL DEVELOPMENT ACTIVITIES**

NAME: Ayman S. Mosallam

EDUCATION
PhD, Structural Engineering, Catholic University of America, 1990
MS, Civil Engineering, Catholic University of America, 1985
BS, Civil Engineering, Cairo University, 1978

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2007-present
UC Irvine, Professor-in-Resident, 2005-2006
Misr University for Science & Technology (MUST), Honorary Professor, 2009-Present
California State University, Fullerton, Director & Professor, August 1, 1995-March 30, 2004
George Washington University, Associate Professor, July 30, 1993-July 1, 1995
George Washington University, Assistant Professor, July 1, 1991-June 30, 1993

NON-ACADEMIC EXPERIENCE

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
International Council on Multi-Functional Materials & Structures (MFMS), Vice Chairman, 2010-Present
International Accreditation Services (IAS), Member of the Technical Advisory Board, 2004-Present
American Concrete Institute, Voting Member ACI 440 Committee, 1993-Present
American Society of Civil Engineers (ASCE), Member of the Materials Directorate and a Control Member on the ASCE Structural Composites and Plastics Committee (SCAP), January 1990-Present

HONORS AND AWARDS
2008 Industry Research Recognition, International Concrete Repair Institute (ICRI),
2007 Outstanding Civil Engineering Faculty Advisor Award in the State of California, The American Society of Civil Engineers (ASCE), Region 9, State of California,
2007 UCI- CEE Faculty of the Year award, UCI Engineering Student Council
2007 Distinguished Engineering Educator Award, Orange County Engineering Council,
2006 Outstanding Research Award, 14th Int. Conference on Composites/Nano Engineering,
2002 Faculty Research Achievement Award, School of Engineering, CSUF
2001 Award of Excellence, Mentor Program, California State University, Fullerton
2000 Distinguished Engineering Educator Award, ASCE O.C. Chapter,
1994 Best Design Paper Award, Society of Plastic Industry
1993 Overall Paper Award, McGraw-Hill Publishing
1992 Best Design Paper Award, Society of Plastic Industry
1992 Best Innovation Paper Award, Plastics World Magazine

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Director, Structural Engineering Test Hall, 2005-Present
UCI Representative, CUREE (Consortium of Universities for Research Chapter in Earthquake Engineering), December 2007-Present
Advisor, UCI ASCE Students Chapter, April 1995-Present
Member, UCI Urban Water Research Center, 2008-Present
Coordinator, UCI-CEE Affiliate Program, December 2007-2008
Advisor, Structures Graduate Committee, July 2008-July 2010
Member, SOE Executive Committee, August 2010-Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Member, Orange County Committee of Green Forum, July 1, 2010 - Present
Associate Editor, Advances in Civil Engineering Journal, 2009 - Present
Founder and Member of Board of Directors, Egypt Green Buildings Council, 2009 - Present
Officer, Consortium of Universities for Research in Earthquake Engineering, 2005 - Present
Editorial Review Board Member, HBRC Journal, 2008 - Present
Editorial Review Board Member, IST Transactions of Civil Engineering and Construction
Chair, IQPC Cost Effective Sustainable Design Construction Egypt, August 2010 - January 2011
Editorial Review Board Member, Composites Part B: Engineering, 1995 - 2010
Board of Advisors, Centre of Excellence in Engineered Fibre Composites, August 2010
Board of Advisors, International Conference on Composite Engineering (ICCE), December 2009

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal

Books, Edited

Conference/Workshop/Symposium Proceedings
Farzad Naeim

Adjunct Professor
Civil and Environmental Engineering

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4149 Engineering Gateway

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(949) 824-2117

Address:
The Henry Samueli School of Engineering
University of California, Irvine
Irvine, CA 92697

Education:
Ph.D. and M.S. Structural Engineering, University of Southern California
J.D. with Highest Honors, Concord University School of Law
B.S. Civil Engineering, University of Tehran

Research:
Dr. Naeim regularly manages and facilitates activities of internal teams of experts in research and development activities, special seismic studies, and the design of specialized computer applications. He has developed an international reputation for cutting edge engineering and computer technology, and was awarded grants by such diverse agencies as the Earthquake Engineering Research Institute (EERI), the Federal Emergency Management Agency (FEMA), the County of Los Angeles, the California Strong Motion Instrumentation Program, Applied Technology Council (ATC), and the United States Geological Survey (USGS), for studying various damage characteristics of earthquakes and their impact on seismic design practice. He has served as Editor-in-Chief of Earthquake Spectra, President of EERI, inaugural Chair of the Governance Board of the U.S. Network for Earthquake Engineering Simulation (NEES), and the Chair of the 10th U.S. National Conference on Earthquake Engineering.
NAME: Will Recker

EDUCATION
BS Civil Engineering, Carnegie Institute of Technology, 1964
MS Civil Engineering, Carnegie Institute of Technology, 1966
PhD Civil Engineering, Carnegie-Mellon University, 1968

ACADEMIC EXPERIENCE
University of California, Irvine
Professor of Civil Engineering, 7/79-present
Director, Institute of Transportation Studies, 7/83-8/06
Chair, Civil Engineering, 7/80-9/81
State University of New York at Buffalo
Professor of Engineering and Applied Sciences, 9/78-6/79
Acting Chairman, Department of Civil Engineering, 1/79-6/79
Associate Professor of Engineering and Applied Sciences, 9/71-9/78
Assistant Professor of Engineering and Applied Sciences, 9/67-9/71

NON-ACADEMIC EXPERIENCE
Senior Research Engineer, Research Laboratories, General Motors Corporation, 9/74-9/76
Hydraulic Engineer, Pennsylvania Department of Forests and Waters, 6/64-9/64

HONORS AND AWARDS
1976 Dow Outstanding Young Faculty Award, American Society for Engineering Education.
2003 Fariborz Maseeh Best Faculty Research Award, Henry Samueli School of Engineering

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA - numerous

SELECTED PUBLICATIONS from the past five years


NAME: Stephen Ritchie

EDUCATION
Ph.D., School of Civil and Environmental Engineering, Cornell University, 1983.
M.Eng.Sc., Department of Civil Engineering, Monash University, Australia, 1981.
B.E. (First Class Honours), Department of Civil Engineering, Monash University, Australia, 1977.

ACADEMIC EXPERIENCE
Associate Director, University of California Transportation Center, 1/09 to present.
Director, Institute of Transportation Studies, University of California, Irvine, 9/06 to present.
Chair, Department of Civil and Environmental Engineering, University of California, Irvine, 9/95 to 6/00.
Vice-Chair, Department of Civil and Environmental Engineering, University of California, Irvine, 10/88 - 8/95.
Professor, Department of Civil and Environmental Engineering and Research Engineer, Institute of Transportation Studies, University of California, Irvine, 7/93 to present.
Associate Professor, Department of Civil Engineering and Associate Research Engineer, Institute of Transportation Studies, University of California, Irvine, 7/88 - 6/93.
Assistant Professor, Department of Civil Engineering, and Assistant Research Engineer, Institute of Transportation Studies, University of California, Irvine, 7/85 - 6/88.
Assistant Professor, Department of Civil Engineering, University of Washington, 9/83 - 8/85.
Acting Assistant Professor, Department of Civil Engineering, University of Washington, 7/83 - 9/83.

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Society of Civil Engineers (Member)
Institute of Transportation Engineers
Transportation Research Board

HONORS AND AWARDS
Frank M. Masters Transportation Engineering Award, American Society of Civil Engineers (award citation: “For his innovative work in the development and application of new technologies in transportation engineering.”), 2010
Distinguished Engineering Educator of the Year, American Society of Civil Engineers, Orange County Branch, California, 2010.

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA (last 5 years)
Council on Planning and Budget, University of California, Irvine: Chair 9/12-8/13; Member 9/11-present
Academic Planning Group, University of California, Irvine, 9/12-8/13
Budget Work Group, University of California, Irvine, 9/12-8/13
University Committee on Planning and Budget, University of California, 9/12-8/13.
Western Association of Schools and Colleges Reaccreditation Steering Committee, University of California, Irvine, 9/12
Executive Committee, Henry Samueli School of Engineering, 9/12-8/13
Chair, Samueli Fellowship Selection Committee, Department of Civil and Environmental Engineering, 8-9/10.
Planning Committee on Complex Systems Engineering, The Henry Samueli School of Engineering, 9/09 to present
Executive Committee, University of California Transportation Center, 9/06 to present
Hydrometeorology and Remote Sensing Search Committee, Department of Civil and Environmental
Engineering, 9/08-6/09
Academic Personnel Drafting Committees (various), Department of Civil and Environmental Engineering, 10/03 to present.

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA (last 5 years)
Paper Reviewer, Transportation Research, ASCE Journal of Transportation Engineering, ASCE
Journal of Computing in Civil Engineering, Transportation Research Board, International
Symposium on Transportation and Traffic Theory, IEEE Transactions on Intelligent Transportation
Systems, IEEE Transactions on Neural Networks (various ongoing).
Advanced Technology Committee, Transportation and Development Institute, American Society of Civil
Engineers, 1/08 to present.
Executive Committee, Transportation Research and Technology Advisory Panel; Business,
Transportation and Housing Agency, State of California, 10/06 to 6/10.
Advanced Technology Committee, Transportation and Development Institute, American Society of Civil
Engineers, 1/08 to present.
International Scientific Advisory Committee, Third International Symposium on Transport Simulation,
Gold Coast, Australia, 8/08.
International Scientific Committee, 5th International Engineering and Construction Conference, Irvine,
USA, 8/08.
Committee on Ports and Channels, Transportation Research Board, Friend of the Committee, 1/09 to
present.

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years
Detection Systems.” IEEE Transactions on Intelligent Transportation Systems, Vol. 8, No. 3, pp. 460-
469.
Data,” Transportation Research Record No. 2086, 2008, pp 8-22, National Research Council
“Environmental Impacts of a Major Freight Corridor: A study of the I-710 in California.” Transportation
164-178, Inderscience Ltd.
of shifting San Pedro Bay Port’s freight from truck to rail in Southern California.” Transportation
Research Record No. 2162, 2010 pp 25-34, National Research Council.
planning and analysis.” Transportation Research Record, in press

Quality and Health Benefits of the Clean Truck Program in the Alameda Corridor, CA. Transportation
NAME: Diego Rosso

EDUCATION
PhD, Environmental Engineering, University of California, Los Angeles 2005
MS, Environmental Engineering, University of California, Los Angeles 2003
Chemical Engineering Laurea (M.S. equivalent), University of Padova, 2002

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, 2008-Present
University of California, Postdoctoral Scholar and Lecturer, 2006-2007

NON-ACADEMIC EXPERIENCE
Hyperion Wastewater Treatment Plant, Engineering Intern, August 2001-November 2001
DRH2O LLC, Los Angeles, CA, Consultant, Single Proprietor/Manager. 2010-Present

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS
EIT – Engineer-In-Training, State of California, 2004

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Academy of Environmental Engineers (AAEE), Association of Environmental Engineering and Science Professors (AEESP), California Water Environment Association (CWEA), Water Environment Federation (WEF), International Water Association (IWA), Engineers Without Borders (EWB)

HONORS AND AWARDS
American Academy of Environmental Engineers: Excellence in Environmental Engineering Award for Research, 2011
Faculty Career Development Award, University of California, Irvine, 2008-2009
Faculty Fellowship 2009, University of California Education Abroad Program, 2008
1st prize in poster symposium, Water Environment Federation, 80th WEFTEC Conference, 2007
Outstanding Student Group of the Year Award, UCLA, Henry Samueli School of Engineering and Applied Science, 2005
Best Networking in Project Award, 2nd Engineers Without Borders International Conference, Denver, CO, 2004

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Undergraduate Adviser, Environmental Engineering Program, University of California, Irvine, 2011-Present
Preliminary Examination Panelist, Environmental Engineering Program, University of California, 2011-Present
Member, Undergraduate Affairs Committee, Civil and Environmental Engineering Department, University of California, Irvine, 2011-Present
Member, Environmental Engineering Graduate Program Committee, August 2010-Present
Civil Engineering Faculty Liaison for International Programs, 2009-Present
Member, Computer/Web, October 1, 2008-Present
Committee Member, Strategic Operations Advisory Panel, Henri Samueli School of Engineering, University of California, Irvine, 2011-2012
Advisor, Engineers Without Borders - UCI Chapter, 2008-Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Member, IWA, Asset Management for Enhancing Energy Efficiency in Water and Wastewater Systems - Scientific Committee, 2012 - Present
Member, Water Environment Federation Fracking Task Group, 2012 - Present
Member, WEFTEC Municipal Wastewater Symposium Sub-Committee, 2012 - Present
Member, WEFTEC Municipal Wastewater Treatment Committee, 2012 - Present
Project Advisory Committee Member, Water Environment Research Foundation U2R08 Project, 2010 - Present
Vice President, Engineers Without Borders - Orange County Professional Chapter, 2008 - 2009
Member, IWA, Task Group on Adaptation, 2008 - Present
Advisor, Anjali Environmental and Humanitarian Foundation, March 2006 - Present
Reviewer, Extramural Funding, National Academy of Sciences – United States Agency for International Development, 2012
Reviewer, Extramural Funding, National Science Foundation, 2012
Senior Member, IWA, NOM Specialty Conference 2011 –Scientific Committee, 2010
Organizer, IWA, Southern California Academic Member Dialogue, 2010
Member, IWA, WWTMod Seminar - Senior Scientific Committee, 2010
Reviewer, Extramural Funding, Santa Ana Watershed Protection Agency – CA Proposition 84 Funds, 2010
Co-Chair, WEFTEC Conference - “Aeration 101” Workshop, 2009

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


PROFESSIONAL DEVELOPMENT ACTIVITIES
Short Course on Membrane Bio-Reactors, NWRI, 2006
NAME: Brett F. Sanders

EDUCATION
PhD, Civil Engineering, University of Michigan, 1997
MSE, Civil Engineering, University of Michigan, 1994
BS, Civil Engineering, University of California at Berkeley, 1993

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2009-2011
UC Irvine, Associate Professor, 2003-2009
UC Irvine, Assistant Professor, 1997-2003

NON-ACADEMIC EXPERIENCE
California Coastal Commission, Consultant, Technical Advisory Committee Member, 2010-Present
Port of Los Angeles, Consultant, Analysis of harbor circulation and water quality, 2004-2006
Orange County District Attorney, Consultant, Analysis of flood and erosion risk and expert witness testimony, 2003-2006
Orange County Sanitation District, Consultant, Analysis of sewer exfiltration, 2003-2005
City of Newport Beach, Consultant, Analysis of harbor circulation and water quality, 2002-2004
Ventura County, Consultant, Analysis of harbor circulation and water quality, 2002-2003
City of Avalon, Consultant, Analysis of harbor circulation and water quality, 2001-2002
Orange County Sanitation District, Consultant, Analysis of wetland circulation and water quality, 2000-2002

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Geophysical Union (AGU)
American Society of Civil Engineers (ASCE)
Chi Epsilon Honor Society
International Association for Hydraulic Research (IAHR)

HONORS AND AWARDS
Outstanding Reviewer Award, Journal of Hydraulic Engineering, ASCE, 2011
Teaching Excellence Award, Division of Undergraduate Education, 2004 and 2009
Fariborz Maseeh Best Faculty Teacher Award (shared), Henry Samueli School of Engineering, University of California, Irvine, 2004
National Science Foundation CAREER Award, 2000
Outstanding Paper Award, International Conference on Hydrosience and Engineering, Cottbus Germany, September 1998
Victor L. Streeter Fellow, 1993-1996

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Department Chairperson, Civil and Environmental Engineering, University of California, Irvine, July 1, 2010-Present
Advisor, Chi Epsilon, 2010-Present
Advisor, UCI Chapter of ASCE, 1997-2002
Chair, SOE Undergraduate Student Affairs Committee, 2005-2006
Director, Graduate Program in Environmental Engineering, 2002-2006
Member, UC Irvine Graduate Council, 2008-2010
SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Editorial Review Board Member, Advances in Water Resources, 2009 - Present
Associate Editor, ASCE Journal of Engineering Mechanics, 2006 - 2010
Reviewer, Extramural Funding, National Science Foundation, IMME Program Panelist, 2009
Chair, Fluids Committee, Engineering Mechanics Division, ASCE, October 1, 2006 - September 30, 2008
Control Member, Fluids Committee, Engineering Mechanics Division, ASCE, 2006 - Present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


Conference/Workshop/Symposium Proceedings
NAME: Jean Daniel M. Saphores

EDUCATION
PhD, Environmental and Natural Resource Economics, Cornell University, 1997
MA, Economics, Cornell University, 1994
MS, Environmental System/Civil Engineering, Cornell University, 1994
MS, Geotechnical Engineering, University of Colorado, Boulder, 1989
BS, Civil engineering, Ecole Nationale des Ponts et Chaussees (ENPC), 1988

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2006-Present
UC Irvine, Assistant Professor, 2005-2006

NON-ACADEMIC EXPERIENCE
Woodward-Clyde Consultants, Denver, CO, Staff Engineer, September 1989-August 1991
Woodward-Clyde Consultants, Denver, CO, Staff Engineer, September 1986-August 1987

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Society of Civil Engineers, 2006-Present
Western Economic Association International, 2001-Present
Association of Collegiate School of Planning (ACSP), August 2000-Present
Agricultural & Applied Economics Association, 1997-July 2005

HONORS AND AWARDS
Pike Johnson Award for outstanding paper published in the field of transportation systems planning and administration, Transportation Research Board of the National Academies, Washington, DC, 2010
Best publication award, UC Toxie Substances Research & Teaching Program, 2007
AT&T Industrial Ecology Fellow, AT&T, 2003-2004
AT&T Industrial Ecology Fellow, AT&T, 2002-2003

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Director, Transportation Science, March 2009-Present
Chair, Undergraduate Affairs Committee, September 30, 2011-September 30, 2012
Member, CEE affiliates committee, September 2009-August 2010
Chair, Undergraduate affairs committee, September 2009-August 2010
Member, Undergraduate Affairs Committee, September 2007-August 2009
Member, MS in Engineering Management committee, March 2012-Present
Member, UCI Senate Council on Faculty Welfare, April 2012-July 2015
Member, BUSHFA, September 2007-July 2010

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Member, NHTS task force, Transportation Research Board of the National Academies, August 2011 - Present
Member, Sustainability Committee, Los Angeles Section, American Society of Civil Engineers, May 2011 - Present
Member, Committee on Transportation and Energy, Transportation Research Board of the National Academies, April 2011 - Present
Member, Committee on Ports and Channels, Transportation Research Board of the National Academies, April 2010 - Present
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


Conference/Workshop/Symposium Proceedings


NAME: Soroosh Sorooshian

EDUCATION
Ph.D. Engineering (Water Resources and Hydrologic Systems Analysis), UCLA, 1978
M.S. Engineer Degree Systems Engineering, UCLA, 1977
B.S. Mechanical Engineering (highest honor), California Polytechnic State University (Cal Poly), San Luis Obispo, California, 1971

ACADEMIC EXPERIENCE
University of California at Irvine, Irvine, California
2003-present Distinguished Professor Depts. of Civil &Environmental Engineering and Earth System Science
2003-present Director, Center for Hydrometeorology & Remote Sensing (CHRS), Dept. of Civil & Environmental Engineering, The Henry Samueli School of Engineering
University of Arizona, Tucson, Arizona
2004-present Adjunct Professor, Dept. of Hydrology and Water Resources
2000-8/2003 Founding Director, NSF Science and Technology Center on “Sustainability of semi-Arid Hydrology and Riparian Areas” (SAHRA)
8/96-2004 Professor and Regents Professor (Since 2000), Dept. of Hydrology and Water Resources
8/89-8/96 Department Head and Professor, Dept. of Hydrology and Water Resources; Professor, Dept. of Systems and Industrial Engineering
8/87-8/89 Professor of Hydrology and Water Resources and Systems and Industrial Engineering
1/83-7/87 Associate Professor of Hydrology and Water Resources
Case Western Reserve University, Cleveland, Ohio
7/78-12/82 Assistant Professor of Systems Engineering and Civil Engineering

NON-ACADEMIC EXPERIENCE
Served as a consultant for several government, private consulting companies and water and energy utility industries

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
ACADEMY MEMBERSHIPS
U.S. National Academy of Engineering (NAE) – Member, 2003
International Academy of Astronautics (IAA) - Member, 2007
TWAS - the academy of sciences for developing countries - Associate Fellow, 2010

PROFESSIONAL SOCIETY FELLOWSHIPS AND MEMBERSHIPS
Fellow, American Association for the Advancement of Science (AAAS), 1997
Fellow, American Meteorological Society (AMS), 1995
Fellow, International Water Resources Association (IWRA), 2001
Fellow, American Geophysical Union (AGU), 1994
Life Member, Phi Kappa Phi, 1988
Life Fellow, Indian Association of Hydrologists, Roorkee, India
Member, American Water Resources Association (AWRA)
Member, International Association of Hydrological Sciences (IAHS)
Member, American Society of Civil Engineers (ASCE)

HONORS AND AWARDS
Eagleson lectureship, Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI), 2012
4th Prince Sultan Bin Abdulaziz International Prize for Water, Resources Management & Protection
Branch category award (2010)
Honorary professorship, Beijing Normal University (2010)
Walter Orr Roberts Lecturer in Interdisciplinary Sciences Award, American Meteorological Society, 2009
UNESCO Great Man-made River Prize, 2007 awarded to UCI Center for Hydrometeorology and Remote Sensing (CHRS) and NSF STC SAHRA (Sustainability of semi-Arid Hydrologic and Riparian Areas)
Fellow, Japan Society for the Promotion of Science (JSPS) Award, 2006
Robert E. Horton Memorial Lectureship, American Meteorological Society, 2006
Recipient, NASA Distinguished Public Service Medal, 2005
William Nordberg Memorial Lectureship, NASA Goddard Scientific Colloquium, 2004
Group Honor Award for Excellence, U.S. Department of Agriculture, 2001

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, Division Council for Calit2
Member, search committees for faculty as well as other college/department committees

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Member of seven editorial boards
Served on numerous advisory committees, including those of NASA, NOAA, DOE, USDA, NSF, EPA, and UNESCO
Organizer, host, chair/co-chair, session convener/co-convener, panelist for 35+ conferences/workshops/meetings since 2003

SELECTED PUBLICATIONS AND PRESENTATIONS
Author and Co-author of: 190+ peer-reviewed papers (citation h-index 48); 7 books; 33

Contributions in books: 4 Discussions, Replies, Book reviews; 44 Conference Proceedings; 32 Research Reports; 200+Abstracts.

Publications list posted online: http://www.eng.uci.edu/users/soroosh-sorooshian
170+ Invited speaker and Keynote talks for professional, academic, national and international agencies
NAME: Lizhi Sun

EDUCATION
Ph.D., Civil Engineering, University of California, Los Angeles, 1998
M.S., Civil Engineering, University of California, Los Angeles, 1997
M.S., Solid Mechanics, Peking University, Beijing, 1990
B.S., Engineering Mechanics, Zhejiang University, Hangzhou, 1987

ACADEMIC EXPERIENCE
UC Irvine, Professor, Department of Civil and Environmental Engineering (CEE), 2009-Present
UC Irvine, Associate Professor, Department of CEE, 2005-2009
University of Iowa, Associate Professor, Department of CEE, 2004-2005
University of Iowa, Assistant Professor, Department of CEE, 1999-2004

NON-ACADEMIC EXPERIENCE
Air Force Research Laboratory, Summer Faculty Fellow, 2011
Chinese Academy of Sciences Institute of Metal Research, Research Engineer, 1990-1995

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
ASCE, 1998-Present
ASME, 1998-Present
MRS, 1998-Present
AAAS, 2002-Present

HONORS AND AWARDS
DoD/AFRL Summer Faculty Fellow (2011), UCI/School of Engineering Fariborz Maseeh Best Faculty Research Award (2008), Honda Research Initiation Award (2006), Iowa Chapter Chi Epsilon Special Recognition Award (2003), University of Iowa Old Gold Fellowship Award (2003), University of Iowa CARVER Research Award (2000), UCLA/School of Engineering Outstanding Ph.D. Award (1998).

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member of UCI Council on Research, Computing and Libraries (2006-2008, 2010-2013), Graduate Advisor of Civil Engineering Program (2010-2012), UCI Academic Senate Divisional Assembly Representative of HSSoE (2009-2011), Member of HSSoE Executive Committee (2006-2012), HSSoE Faculty Secretary (2006-2008), ABET Lead Faculty of Civil Engineering Program (2006-2010)

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES
Workshop on New Technology in the Learning Environment at the University of Iowa, 2000.
NAME: Jasper A. Vrugt

EDUCATION
Ph.D., Faculty of Science, University of Amsterdam, 2004, Cum Laude
M.S., Faculty of Social and Behavioral Sciences, University of Amsterdam, 1999, Cum Laude

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, Civil and Environmental Engineering, 2010 – present
University of Amsterdam, Associate Professor, Computational Geo-ecology, 2011 – present

NON-ACADEMIC EXPERIENCE
LANL, J. Robert Oppenheimer Distinguished Postdoctoral Fellow, 2006 – 2009
LANL, Director’s Funded Postdoctoral Fellowship, 2005 – 2006

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
AGU, 2005 – present
EGU, 2003 – present
SIAM, 2010 – present
GSA, 2010 – present
NHV, 2004 – present
SSSA, 2006 – present

HONORS AND AWARDS
Sir Frederick McMaster Fellowship, Australia (CSIRO), 2012
Fellow, Geological Society of America (GSA), 2012
Editors’ Choice Award, Water Resources Research (AGU), 2011
Donath Medal, Geological Society of America (GSA), 2011
James B. Macelwane Medal, American Geophysical Union (AGU), 2010
Outstanding Young Scientist Award, European Geosciences Union (EGU), 2010
Fellow, American Geophysical Union (AGU), 2010
Top 50 of Most Talented Young People From the Netherlands (Elsevier), 2009
Early Career Award in Soil Physics, Soil Science Society of America (SSSA), 2007
Hydrology Prize 2004 - 2006, Dutch Hydrological Society (NHV), 2007
J. Robert Oppenheimer Distinguished Postdoctoral Fellowship (LANL), 2006
Director’s Postdoctoral Fellowship (LANL), 2005
Graduated with Cum Laude for Ph.D. degree (UvA), 2004
Dutch National Science Foundation Travel Grant (NWO), 2001 & 2002
Graduated with Cum Laude for M.S. degree (UvA), 1999

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Steering committee member of the Environment Institute, 2010 – present
Member of the Faculty search committee for a position in hydrometeorology, 2010 – present
Member of CEE promotion committee, 2011 – present
Organizer of CEE - seminar series for the academic year 2009-2010.
Member of the qualifying exam committee of five different UCI students from the Departments of Chemistry, Earth System Science, and Civil and Environmental Engineering

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Organizer and Chair of 23 different conference sessions at different (inter)national meetings, 2004 – present
Associate Editor of four different peer-reviewed scientific journals, 2006 – present
Guest-editor of three special issues in Vadose Zone Journal, 2006 – present
Reviewer for 40+ peer reviewed scientific journals, 2001 – present
Governing board and member of technical committee "Modeling and Control of Environmental Systems" of the International Federation of Automatic Control, 2011 – present
Cooperating partner in the Heimholtz research school for high-performance computing in Germany, 2012 – present
Teaching weekly summer schools (7) in Belgium, The Netherlands, Czech Republic and Australia on topics related to model-data fusion in the Earth Sciences. 200+ participants.
External PhD examiner of students from Europe, 2007 – present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES - None
NAME – Mohammad Abdullah Al Faruque

EDUCATION
Ph.D., Computer Science and Engineering, University of Karlsruhe, Germany, 2009
M.S.c., Computer Science and Engineering, Aachen Technical University, Germany, 2004
B.S.c., Computer Science and Engineering, Bangladesh University of Engineering and Technology, Bangladesh, 2002

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, 2012 – Present
Karlsruhe Institute of Technology, Group leader and Chair for Embedded Systems, 2009-2010
Aachen Technical University, Germany, Student Research Worker, 2002-2004

NON-ACADEMIC EXPERIENCE
Siemens Corporate Research, Princeton, NJ, Research Scientist, 2010-2012

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
IEEE, Member
ACM, Member

HONORS AND AWARDS
IEEE/ACM William J. McCalla ICCAD Best Paper Award, 2009
HiPEAC Paper Award, 2008
Best Paper Award Nomination for DAC, 2005
RWTH Masters Scholarship for class performance, 2003
BUET Honors’ List, 2002
BUET Merit Scholarship for class performance, 1996
Prime Minister’s Merit Award in secondary school certificate examination, 1993

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA - none

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Reviewer for funding organizations
National Science Foundation Review, 2011-present
Registration Chair IEEE 7th International Symposium on Networks-on-Chip (NOCS 2013)
Track Chair IEEE 25th Conference on VLSI Design 2012
VLSI-SOC 2010
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:

Journal Publications:

Major Conference Publications:
C6. T. Ebi, M. A. Al Faruque, J. Henkel: "TAPE: Thermal-Aware Agent-Based Power Economy for Multi/Many-Core Architectures", in IEEE/ACM International Conference on Computer-Aided Design (ICCAD'09), San Jose, California, USA, Pages: 302-309, November, 2009 (Received the IEEE/ACM WILLIAM J. MCCALLA ICCAD BEST PAPER AWARD 2009).
C7. M. A. Al Faruque, R. Krist, J. Henkel: "ADAM: Run-time Agent-based Distributed Application Mapping for on-chip Communication", in 45th IEEE/ACM/EDA Design Automation Conference (DAC'08), Anaheim, California, USA, Pages: 760-765, June 2008 (Received a European Network of Excellence on High Performance and Embedded Architecture and Compilation (HiPEAC) Paper Award.)

PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Ender Ayanoglu

EDUCATION
Ph.D., Electrical Engineering, Stanford University, 1986
M.S., Electrical Engineering, Stanford University, 1982
B.S., Electrical Engineering, Middle East Technical University, 1980

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2002-Present
Bilkent University, Visiting Professor, 1990-1991

NON-ACADEMIC EXPERIENCE
Bell Laboratories (AT&T and Lucent), Member of Technical Staff, 1986-1999

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Institute of Electrical and Electronics Engineers (IEEE), 1982-Present

HONORS AND AWARDS
IEEE Fellow, 1998
IEEE Communications Society Best Tutorial Paper Award, 1997
IEEE Stephen O. Rice Prize Paper Award, 1995

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, UC Irvine Committee on Computing, Research, and Libraries, 2007 - 2009

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
IEEE Communications Society, 2004-present
IEEE Information Theory Society, 2004-present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years
Articles, Journal


*Conference/Workshop/Symposium Proceedings*


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Nader Bagherzadeh

EDUCATION
Ph.D., Computer Engineering, The University of Texas at Austin, 1987
M.S., Electrical Engineering, The University of Texas at Austin, 1979
B.S., Electrical Engineering, The University of Texas at Austin, 1977

ACADEMIC EXPERIENCE
Professor, Department of EECS, UCI, 2003-present
Professor and Chair, Department of ECE, UCI, 1999-2002
Associate Professor, ECE, UCI, 1993-1998
Assistant Professor, ECE, UCI, 1988-1993

NON-ACADEMIC EXPERIENCE
AT&T Bell Labs, Member of Tech. Staff, 1980-1985
MCC and Burroughs Austin Research Center, RA, 1985-1987

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
IEEE
AAAS

HONORS AND AWARDS
Best Student Paper award in the proceedings of ASPDAC’02, 2002

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, EECS Engineering Building Committee, 2007-2008
Computer Science and Computer Engineering ABET Czar for EECS Department, 2006-08; 2011
Computer Science Engineering Lead faculty, 2010-2011
Member, EECS Award Committee, 2006-2008
Member, EECS Bylaws Committee, 2005-2008
Personal Ad-hoc Committee, 2006-2012

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Program Committee Member, International Workshop on Applied Reconfigurable Computing
Editorial Review Board Member, International Journal of High Performance Systems
Technical Committee Member (Concurrent Systems), IFIP WG 10.3, 2001-2012
Editorial Review Board Member, International Journal of Computers and Electrical Engineering,

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME: Ozdal Boyraz

EDUCATION:
Ph.D., Electrical Engineering, University of Michigan, 2001
M.S., Electrical Engineering, University of Michigan, 1997
B.S., Electrical & Electronics Eng, Hacettepe University, 1993

ACADEMIC EXPERIENCE:
UC Irvine, Associate Professor, 2011-present
UC Irvine, Assistant Professor, 2005-2011

NON-ACADEMIC EXPERIENCE:
Xtera Communications Inc, Communications R&D Engineer, 2001-2003
Sa-San Inc, Biomedical Engineer, 1993-1995

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS:
IEEE and IEEE-Photonics Society, OSA, SPIE

HONORS AND AWARDS:
2010 DARPA Young Faculty Award
Scientific American Top 50 Inventors and Contributors List, 2005
IEICE Electronics Society 2004 best paper award, 2005
Newport smart table grant, 2005
UCLA Chancellor’s award for the best postdoctoral research scientist, UCLA, 2005
Rackham Travel Grant, 1999-2000
Full Scholarship from the Turkish Ministry of Education for Ph.D. degree in USA, 1997
Full Scholarship from the Turkish Ministry of Education for M.S. degree in USA, 1995

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA:
EECS Department Graduate admission committee
Service in school wide Ph.D. committee membership
Ph.D. Prelim exam committee

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA:
OSA Integrated Optics Committee Member 2007-present
Committee member for 2007 OSA Frontier in optics conference, 2007-present
Conference chair, IEEE LEO Winter topical meeting, 2008
Reviewing: NSF panel reviewer and manuscript reviewing for journals such as Nature Photonics,
Symposium chair, IEEE/LEOS annual meeting, silicon photonics, 2006

SELECTED PUBLICATIONS AND PRESENTATIONS IN LAST FIVE YEARS:
Books and Book Chapters
B1. O. Boyraz “Silicon Raman lasers, amplifier and wavelength converter”, in “Optical Interconnects: The Silicon Approach”, L. Pavesi and G. Guillot (Eds.), Springer-Verlag,

Journals
J2. Feng Qian, Qi Song, En-kuang Tien, Salih K. Kalyoncu, Ozdal Boyraz, "Real-time optical imaging and tracking of micron-sized particles", Optics Communications, 282, 4672-4675, December 2009
J3. En-Kuang Tien, Yuewang Huang, Shiming Gao, Qi Song, Feng Qian, Salih K. Kalyoncu, and Ozdal Boyraz, “Discrete Parametric Band Conversion in Silicon for Mid-Infrared Applications”, Optics Express 2010
J4. Song, Qi; Campione, Salvatore; Boyraz, Ozdal; Capolino, Filippo, “Silicon-based optical leaky wave antenna with narrow beam radiation,” Optics Express, pp. 8735-8749 (2011)
J5 Campione, Salvatore; Guclu, Caner; Song, Qi; Boyraz, Ozdal; Capolino, Filippo, “An optical leaky wave antenna with Si perturbations inside a resonator for enhanced optical control of the radiation,” Optics Express, Vol. 20 Issue 19, pp.21305-21317 (2012)

Conference Publications
C1. S. Campione, Q. Song, C. Guclu, O. Boyraz, and F. Capolino, “Control of the radiation of a silicon-based optical leaky wave antenna through optical pumping,” accepted for presentation at IEEE Photonics Conference (IPC), October 9-13, 2011, Arlington, VA, USA.
C4. O. Boyraz, Y. Huang and X. Sang, "Silicon on sapphire and SOI photonic devices for mid-infrared and near-IR wavelengths", Proc. SPIE 8431, (2012); (Invited)

Presentations and Public Lectures
P2. “Silicon nonlinear optics,” CMOS Photonics winter school, Trento, ITALY, 2009 (Invited)

PROFESSIONAL DEVELOPMENT ACTIVITIES:
Attend international conferences; deliver public lectures and visits to other universities.
NAME - Peter J. Burke

EDUCATION
Ph.D., Physics and Applied Physics, Yale University, 1998
B.A., Physics, University of Chicago, 1992

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2011-present
UC Irvine, Associate Professor, 2005-2011
UC Irvine, Assistant Professor, 2001-2005
Yale University, Acting Instructor, Physics, 1994-1996
Yale University, Teaching Assistant, Physics, 1992-1993
The University of Chicago, College Academic Physics Tutor, 1991-1992

NON-ACADEMIC EXPERIENCE
RF Nano Corporation, Irvine, CA, Consultant, Founder, consultant, and board member,
November 2005-2009

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Physical Society, IEEE, American Association for the Advancement of Science, Sigma Xi

HONORS AND AWARDS

Honors and Awards:

2007  Best Presentation Award (Integration for Sensor Architectures), Nano-DDS conference
2005  Maseeh Award for Outstanding Research, School of Engineering, UC Irvine, 2005
2002-2005 Young Investigator Program award, Army Research Office (ARO)
2002-2005 Young Investigator Award, Office of Naval Research (ONR)
2002  Frontiers of Engineering participant, National Academy of Engineering
1997-2000 Caltech Prize Fellowship: Sherman Fairchild Postdoctoral Scholar
1993-1996 NASA Graduate Student Research Program Fellowship
1992  J.W. Gibbs Fellowship, Department of Physics, Yale University
1986  Eagle Scout

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Associate Chair for Graduate Affairs (2009-2012)
Preliminary exam committee (electromagnetics), 2002-2009
Graduate Admissions Committee, 2002-2007
Dean’s School improvement Committee, April 2006-2007
Academic Freedom Subcommittee, Council on Faculty Welfare (Academic Senate), 2006-2009
Research Council member (UC System wide), UC SMART program, 2002-2005
Committee on Research/Graduate Programs for the Chancellor's Advisory Council, 2004
Created and organizing Cal-IT² Lectures on Molecular Nanotechnology and Quantum Information Science for the ’02-'03 academic year, 2002-2003

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Editorships:
Associate editor, 2009-, IEEE Transactions on Nanotechnology
Conference chairmanships:
Session Chair/Program Committee, European Conference on Antennas and Propagation, 2010
Session Chair/Program Committee, Silicon RF (SiRF) Conference, 2010
Session Chair/Program Committee, International Conference on Printed Electronics, 2009
Session Chair/Program Committee, Nano-DDS, 2009
Session Chair, Eastman Conference, 2008
Session Chair, Nano-DDS, 2007
Session Chair: “Nanowires and Nanotubes for Sensing”, SPIE Conference (Optics East 2004)

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Filippo Capolino

EDUCATION
Ph.D., Electrical Engineering, University of Florence, 1997
Laurea degree, Electrical Engineering, University of Florence, 1993

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2012-present
UC Irvine, Assistant Professor, 2008-2012
Department of Electrical and Computer Engineering, University of Houston, Adjunct Assistant Professor, 2003-2008
Department of Information Engineering, University of Siena, Assistant Professor, 2002-2008
Department of Electrical and Computer Engineering, University of Houston, Visiting Research Assistant Professor, 2005-2006
Department of Information Engineering, University of Siena, Research Associate, 1999-2002
Department of Aerospace and Mechanical Engineering, Boston University, Visiting Researcher, 1997-1998 and 1998-1999

NON-ACADEMIC EXPERIENCE - none

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Senior Member IEEE, Optical Society of America (OSA), SPIE

HONORS AND AWARDS
Co-Author of one of the "Fast Breaking Papers", October 2007
“R. P. W. King Prize Paper Award,” from the IEEE Antennas and Propagation Society, given to an author under age 36 for the most outstanding paper published in the IEEE Transactions on Antennas and Propagation in 2000

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Chair of the Preliminary Exam Committee, EE Circuits & Devices, 2009 -- present
Member, Graduate Admission Committee, 2012-present.
Member of MS and PhD exam and thesis dissertation committees

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor IEEE 2002-2008
Editorial Review Board Member, Journal Metamaterials, 2007 - 2013
Principal Coordinator, Consortium of EU PhD Programmes in Metamaterials, 2004-2010
Session Organizer and Chair, at several international conferences
Technical Program Committee (TPC) Member for several international conferences
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


**Books**


**Articles, Journal**


**PROFESSIONAL DEVELOPMENT ACTIVITIES** - none
NAME - Pai H. Chou

EDUCATION
Ph.D., Computer Science & Engineering, University of Washington, 1998
M.S., Computer Science & Engineering, University of Washington, 1993
A.B., University of California, Berkeley, 1990

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2012-present
UC Irvine, Associate Professor, 2006-2012
UC Irvine, Assistant Professor, 1999-2006

NON-ACADEMIC EXPERIENCE - none

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
ACM (Association of Computing Machinery)
IEEE (International Electrical and Electronic Engineers)

HONORS AND AWARDS
Design Contest Award, DAC/ISSCC, 2007
Best Demo Award, IEEE SECON, 2006
Faculty Early Career Development (CAREER) Award, National Science Foundation, 2005
Chancellor’s Award for Excellence in Undergraduate Research UC Irvine, 2005
Recognition of Service Award, Association for Computing Machinery (ACM), 2004
Best paper award, Asia South-Pacific Design Automation Conference, 2002
SIGDA Technical Leadership Award, ACM SIGDA, 2002

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Associate Chair, Computer Engineering Program, September 1, 2009-present
Undergraduate Advisor, Computer Engineering (CpE), 2004-2006
Undergraduate Advisor, Computer Science and Engineering (CSE), 2004-2006
Member, Facilities Improvement Committee, EECS Department, 2003-2006
ECE Department Webmaster, 2000-2003
ECE/School of the Arts joint Ad hoc Search Committee, 2000-2001
ECE Department Search Committee, 1999-2000
Member, HSSoE Executive Committee, 2007-present
CSE Representative, UGSC, HSSoE, 2003-2006
Web/Communication Committee, The Henry Samueli School of Engineering, 2003-2005
Board on Undergraduate Scholarships, Honors, and Financial Aid, 2003-2005
Faculty representative to committee, Student Fees Advisory Committee, 2001-2002
Member, Committee on Undergrad Affairs, 2000-2002
SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor, IEEE Embedded Systems Letters, 2009-present.
Associate Editor, Design Automation for Embedded Systems, Springer, 2005-present
Associate Editor, IEEE Transactions on VLSI Systems, 2001-2004

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal

Conference/Workshop/Symposium Proceedings

PROFESSIONAL DEVELOPMENT ACTIVITIES -
ABET Faculty Workshop on Sustainable Assessment Process, February 2010.
NAME - Franco De Flaviis

EDUCATION
Ph.D., Department of Electrical and Computer Engineering, University of California, Los Angeles, 1997
M.S., Department of Electrical and Computer Engineering, University of California, Los Angeles, 1994
Laurea Degree, Department of Electrical Engineering, University of Ancona, 1990

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2009-present
UC Irvine, Associate Professor, 2003-2009
UC Irvine, Assistant Professor, 1998-2003
Postdoctoral Fellow, Electrical Engineering, University of California, Los Angeles, 1998
Department of Electrical Engineering, University of California, Visiting Researcher, 1991-1992

NON-ACADEMIC EXPERIENCE
Phraxos R&D, Project Manager, 1995
Alcatel Telecommunication, Junior Engineer, 1990

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
The Institute of Electrical and Electronic Engineers (IEEE), Member

HONORS AND AWARDS - none

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, Faculty Improvement committee, 2003
Chair, Preliminary exam in Electromagnetics, 2002-2006
Member, Preliminary exam committee in Electromagnetic, 1999-2001
Member of UC academic senate for the Henry Samueli School of Engineering Department representative to the Executive Committee, 2000-present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor, Electromagnetics Journal, 2004-present
Associate Editor, IEEE Applied Wireless and Propagation Journal (AWPL), 2004-present
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

*Articles, Journal*


*Books, Authored*


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Brian C. Demsky

EDUCATION
Ph.D., Computer Science, Massachusetts Institute of Technology, 2006
S.M., Computer Science, Massachusetts Institute of Technology, 2001
B.S., Physics, University of Texas at Austin, 1998
B.S., Electrical Engineering, University of Texas at Austin, 1998

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2011-present
UC Irvine, Assistant Professor, 2006-2010
UC Irvine, Assistant Acting Professor, 2005-2006
MIT Computer Science and Artificial Intelligence Lab, Research Assistant, 1999-2005
MIT Research Lab for Electronics, Research Assistant, 1998-1999
National Undergraduate Fellowship in Plasma Physics and Fusion Engineering, Undergraduate Research, 1996-1997
Applied Research Labs Honors Program at the University of Texas at Austin, Summer Research Assistant, 1997
National Science Foundation Research Experience for Undergraduates at the University of Connecticut, Undergraduate Research Assistant, 1995

NON-ACADEMIC EXPERIENCE - none

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
ACM Special Interest Group on Software Engineering (SIGSOFT)

HONORS AND AWARDS
ACM SIGSOFT Distinguished Paper Award for ICSE 2005, 2005
Hertz Foundation Fellowship, 1998-2003

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Served on committee for Daniel Wang’s Qualifying Exam, 2006
Undergraduate Faculty Advising, April 18, 2006
Served on committee for Jiwon Hahn’s Qualifying Exam, 2006

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Reviewer, Extramural Funding, Advanced Execution Systems, NSF, 2006
Program Committee Member, 2005 International Conference on Autonomic Computing (ICAC 2005), 2005
Referee, Eleventh International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2004), 2004
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

**Articles, Journal**


**Conference/Workshop/Symposium Proceedings**


**Reports, Technical**


**PRESENTATIONS**

Reliable software design with built-in repair mechanisms, University of California at Irvine, April 2006.

Automatic detection and repair of errors in data structures, Massachusetts Institute of Technology, November 2005.

PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Rainer Doemer

EDUCATION
Doktor der Naturwissenschaften (Ph.D.), Information and Computer Science, University of Dortmund, 2000
Diplom-Informatiker (M.S.), Information and Computer Science, University of Dortmund, 1995
Vordiplom Informatik (B.S.), Information and Computer Science, University of Dortmund, 1991

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2009-present
UC Irvine, Assistant Professor, 2003-2009
UC Irvine, Postdoctoral Researcher, 2001-2003

NON-ACADEMIC EXPERIENCE
Y Explorations Inc., Lake Forest, California, CAD R&D Engineer, 1999-2000

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
IEEE Member, Computer Society (since 1996)

HONORS AND AWARDS
2013 EECS Faculty of the Year, Engineering Student Council
2008 Faculty Early Career Development Award, National Science Foundation (NSF)
2005 Best Paper Award, International Embedded Systems Symposium (IESS)

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
2013-present Associate Chair for Computer Engineering
2011-2012 Chair, Steering Committee, Computer Science and Engineering Program
2010-2011 Co-Chair, Steering Committee, Computer Science and Engineering Program
2006-present Steering Committee Member, Computer Science and Engineering (CSE) Program
2010-2012 Committee Member, EECS Faculty Search Committee
2006-present Committee Member, EECS Preliminary Examination in CpE
2010-present Committee Member, EECS Computing Committee

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Program Chair, International Embedded Systems Symposium (IESS), Irvine, California, 2007
Special Session Organizer, ASPDAC’09, ASPDAC’10
Technical Program Committee Member: DAC, DATE, CODES+ISSS, IESS, MEMOCODE
Reviewer for Conferences: DAC, DATE, CODES+ISSS, ICCAD, ISCAS, IESS
Reviewer for Funding Agencies: National Science Foundation (NSF), FCT of Portugal, Dutch Technology Foundation
Board of Trustees Member, Waldorf School of Orange County, 2006-2012

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Books, edited


Journal Articles


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME – Paniz Ebrahimi

EDUCATION
Ph.D., Electrical Engineering, University of Southern California, 2004
M.S., Electrical Engineering, University of Southern California, 2000
B.S., Electrical Engineering, Sharif University of Technology, 1996

ACADEMIC EXPERIENCE
UC Irvine, Lecturer, 2009-present (on and off)
University of Southern California, Research Associate, 2006–2007
University of Southern California, Post-Doctoral Researcher, 2005–2006
University of Southern California, Research Assistant, 1999-2004
University of Southern California, Teaching Assistant, 1998-2004
Sharif University of Technology, Research Assistant, 1996-1997
Sharif University of Technology, Teaching Assistant, 1993-1995

NON-ACADEMIC EXPERIENCE
Middle school Algebra teacher at the Neighborhood Academic Initiative at USC, 2003-2004
Member of USC’s International Student’s Assembly, 1999-2000
Co-founder of “NOJABA” club, an archeological and astronomical travel club, 1993

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS - none

HONORS AND AWARDS
Two issued Patents:
- Compensation for polarization-mode dispersion in multiple wavelength-division multiplexed channels without separate composition for each individual channel, US patent #6,603,890
- Polarization-mode dispersion emulator, US patent #6,542,650

Research paper ranked 1st, upgraded to invited lecture, Conference on Lasers and Electro-Optics, 2002

Research Paper ranked 1st among 64 papers submitted to the amplifier committee of the Conference on Lasers and Electro-Optics, CLEO-2001

Outstanding Academic Achievement Award, Association of Professors and Scholars of Iranian Heritage, 2000
Outstanding Leadership Award, Office of international students, 2000

Gold Medal in Iranian national student chess competition championship awards, 1995 (Silver, 1993; Bronze, 1994)

Letter of Honor from Dean of Physics Department, for building Hertz' antenna, 1993

Letter of Honor from Vice President of Sharif University of Technology, 1993

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Faculty host in annual pancake breakfast, 2009

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Technical Reviewer, IEEE Journal of Selected Topics in Quantum Electronics (JSTQE)
Technical Reviewer, IEEE Journal of Lightwave Technology (JLT)
Technical Reviewer, IEEE Photonic Technology Letters (PTL)

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES
Attended the yearlong Future Professoriate Program, with Center for Excellence in teaching at USC.
NAME - Ahmed Eltawil

EDUCATION
Ph.D., Integrated Circuits and systems, University of California, Los Angeles, 2003
M.S., Electronics and Communication Engineering, Cairo University, 1999
B.S., Electronics and Communication Engineering, Cairo University, 1997

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2010-present
UC Irvine, Assistant Professor, 2005-2010
University of California, Los Angeles, Department of Electrical Engineering, Research Engineer, 2003-2005
University of California, Los Angeles, Department of Electrical Engineering, Ph.D. Research, 1998-2001

NON-ACADEMIC EXPERIENCE
Consultant to several companies including Broadcom, Interdigital, Silvus Communications, Newport Media, Emulex among others
Innovics Wireless, Director of VLSI Engineering, 2002-2003
Innovics Wireless, Senior Design Engineer, 2001-2002

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Association of Public Safety communications Officials (APCO), Member, 2006-present
Institute of Electrical and Electronics Engineers (IEEE), Member, 1996-present

HONORS AND AWARDS
Recipient of the National Science Foundation CAREER award, 2010
Honored as Boeing Distinguished External Researcher and Scholar
Nominated for Engineering Professor of the Year Award, UCI student council, 2006-2009
Henry Samueli Faculty Fellow, January 2005-December 2007
Best Paper Award, IEEE International Symposium on Quality Electronics “ISQED06”, 2006
Recipient of the Henry Samueli Excellence in Teaching Award, School of Engineering, University of California, Los Angeles, 2001

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, Campus-wide Honors Program Committee, 2006-2008
Representative of School of Engineering at the Campus-Wide Honors Program for community outreach (2006-2007).
Faculty member of CAMP, MESA and UROP which are state and local programs designed as outreach activities to engage undergraduates, particularly women and minorities.
Established state of the art wireless experimental lab at UC Irvine.
SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Technical committee member on several conferences and professional meetings including ICCAD, ISQED, ICC among others.
Reviewer for multiple journals, conferences and granting agencies.
Active in industry outreach via tutorials and invited talks at prestigious companies, including IBM, LSI, Intel, Broadcom etc.
Participated in several multi university/industry initiatives and panels by Department of Justice (DOJ) to identify new technologies for low-power cognitive radios to support mission critical public safety personnel.

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

*Articles, Journal*


*Conference/Workshop/Symposium Proceedings*


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Daniel D. Gajski

EDUCATION
Ph.D., Computer and Information Science, University of Pennsylvania, 1974

ACADEMIC EXPERIENCE
University of California at Irvine, Professor Above Scale, 1987-present
University of Illinois at Urbana-Champaign, Asst. Professor, Assoc. Professor, Professor, 1977-1987
Center for Supercomputing Research and Development at UIUC, Director, 1983-1984

NON-ACADEMIC EXPERIENCE
Burroughs Corporation, Project Engineering, Federal and Special Systems Group, 1974-1976
Ericsson, Senior Engineer, Development Laboratory, 1962-1969
SpecC Technology Open Consortium, Consultant, 2000-2003

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Association of Computing Machinery (ACM), 1978
Institute of Electrical and Electronic Engineers (IEEE), 1977

HONORS AND AWARDS
LifeTime Achievement Award, European Design and Automation Association
Henry Samueli Endowed Chair in Computer System Design, 2003-present
Honorary Doctorate, University of Oldenburg, Germany, 2006
Member, Croatian Academy of Engineering, 2001

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Faculty Chair, Electrical Engineering and Computer Science, 2006
Recruiting Committee, Electrical Engineering and Computer Science, 2005
Undergraduate Program Committee, Electrical Engineering and Computer Science, 2004
Henry Samueli Turing Endowed Chair in Computer System Design, 2003-present
Faculty Chair, The Henry Samueli School of Engineering, 2006
Director, Center for Embedded Computer Systems, 1995-present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Program Committee, CODES/ISSS Conference, 1984-2010
Steering Committee, CODES/ISSS Conference, 2003-2006

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years
Articles, Journal


Books, Chapters


Conference/Workshop/Symposium Proceedings


PRESENTATIONS


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Jean-Luc Gaudiot

EDUCATION
Ph.D., Computer Science, University of California, Los Angeles, 1982
M.S., Computer Science, University of California, Los Angeles, 1977
"Diplôme d'Ingénieur" (Electrical Engineering Diploma), École Supérieure d'Ingénieurs en Electronique et Electrotechnique, 1976

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2002-present
University of Southern California, Department of Electrical Engineering Systems, Professor, 1996-2001
University of Southern California, Department of Electrical Engineering-Systems, Associate Professor, 1989-1996
University of Southern California, Department of Electrical Engineering-Systems, Assistant Professor, 1982-1989

NON-ACADEMIC EXPERIENCE
TRW Technology Research Center, Member of Technical Staff, 1980-1982
Teledyne Controls, Software Engineer, March 1979-August 1980
Northrop Grumman Corporation, Pico Rivera, California, Consultant, 1997-2007
Alshuler, Grossman, Stein, and Kahan LLP, Los Angeles, California, 2002-2004

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
ACM
ACM Sigarch
IEEE
IEEE Computer Society
IEEE Computer Society Technical Committee on Parallel Processing, Member of the Advisory Board
IFIP Working Group 10.3 - Concurrent Systems, Chair from 1995-2001, 1995-present

HONORS AND AWARDS
AAAS Fellow (American Association for the Advancement of Science), 2007
International Federation for Information Processing (IFIP) Silver Core Member, 2007
IEEE Computer Society Golden Core Member, 2003
IEEE Computer Society Meritorious Service Award, 2002
IEEE Fellow, 1999
SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Department Chairperson, Department of Electrical Engineering and Computer Science, 2003-2009

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Chair of the Steering Committee of the International Conference on Parallel Architectures and Compilation Techniques (PACT), September 2006-present
Member of the Technical Committee on Computer Architecture Advisory Board, 2005-present
Member of the "Conseil de Perfectionnement du Groupe ESIEE (Board of advisors)", 2005 - present
Permanent member Steering Committee Simpósio Brasileiro de Arquitetura de Computadores e Processamento de Alto Desempenho (SBAC-PAD), 2005-present
Member, NSF Review panel, 2009
Editor, Special Issue of the Journal of Supercomputing on Secure, Manageable and Controllable Grid Services, 2009
Member of the Program Committee of the 2009 Simpósio Brasileiro de Arquitetura de Computadores e Processamento de Alto Desempenho (SBAC-PAD), 2009
Member of the Program Committee of the Secure, Trusted, Manageable and Controllable Grid Services and Systems Workshop (STMC-Grid'2009), 2009-2009
Member of the Search Committee for the new Editor-in-Chief of IEEE Computer Architecture Letters, 2009
Editor, Special Issue of the Journal of Supercomputing (NPC 2007), 2008

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Michael M. Green

EDUCATION
Ph.D., Electrical Engineering, University of California, Los Angeles, 1991
M.S., Electrical Engineering, University of California, Los Angeles, 1988
B.S., Electrical Engineering, University of California, Berkeley, 1984

ACADEMIC EXPERIENCE
UC Irvine, Chair of the Department of Electrical Engineering & Computer Science, 2009-present
UC Irvine, Professor, 2007-present
UC Irvine, Associate Professor, 1997-2007
Swiss Federal Institute of Technology (EPFL), Professeur Invité, 2006-present
Department of Electrical Engineering, University at Stony Brook, Associate Professor, 1996
Department of Electrical Engineering, University at Stony Brook, Assistant Professor, 1991-1996

NON-ACADEMIC EXPERIENCE
Cypress Semiconductor Corp, Technical Advisory Board Member, October 2002-2004
Mead Microelectronics, Inc, Short course instructor, April 1996-2001
Newport Communications (now Broadcom Optical Transport Group), Senior Design Engineer, June 1999-September 2001
Hughes Aircraft Co. Research Center, Researcher, March 1988-July 1988
National Semiconductor Corp, IC Design Engineer, September 1984-July 1987
Qlogic Corporation, Aliso Viejo, CA, Consultant, Advise on high-speed IC designs for fiber channel products., June 2002-August 2005

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
ASEE
Eta Kappa Nu
IEEE
Sigma Xi
Tau Beta Pi

HONORS AND AWARDS
Engineering Faculty Member of the Year, UCI Engineering Student Council, June 2008
Fariborz Maseeh Best Teaching Award, May 2007
Engineering Faculty Member of the Year, UCI Engineering Student Council, June 2004
Chancellor’s Award for Excellence in Undergraduate Research, 2003
Best Project Award, NSF Center for Design of Analog/Digital Integrated Circuits, February 1996
Guillemin-Cauer Award, April 1994
W. R. G. Baker Prize, November 1993
SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Chair, Dept. of EECS, September 2, 2009-Present
ABET Lead Faculty for EE Program, July 2006-August 2009
Graduate Advisor, Dept. of Electrical & Computer Engineering, September 2002-June 2003
Member, Council on Education Programs, July 2007-August 2009

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Program Review Committee & Session Chair, Inlt. Solid-State Circuits Conference, 2004 - 2010
Guest Editor, IEEE Journal of Solid-State Circuits, December 2009
Associate Editor, IEEE Transactions on Circuits & Systems - I -, July 2003 - May 2005
Short Course Instructor, Mead Microelectronics, 1998 - 2004

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


PROFESSIONAL DEVELOPMENT ACTIVITIES
Faculty Workshop on Sustainable Assessment Processes, Feb. 2010, Las Vegas
NAME - Glenn E. Healey

EDUCATION
Ph.D., Computer Science, Stanford University, 1988
M.S., Mathematics, Stanford University, 1986
M.S., Computer Science, Stanford University, 1985
BSE, Computer Engineering, University of Michigan, 1984

ACADEMIC EXPERIENCE
UC Irvine, Professor, 1999-present
UC Irvine, Associate Professor, 1995-1999
UC Irvine, Assistant Professor, 1989-1995

NON-ACADEMIC EXPERIENCE
IBM Research, Scientist, 1988-1989
Schlumberger Palo Alto Research, Consultant, 1986

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
ACM
IEEE
IEEE Computer Society
SPIE

HONORS AND AWARDS
SPIE Fellow, 2007
IEEE Fellow, 2004
IEEE Outstanding Service Award, 1997
IEEE Presentation Award, 1997
ECE Professor of the Year, 1996
IEEE Senior Member, 1996
School of Engineering Teaching Award, 1993
PreGraduate Mentorship Award, 1991-1992
Eta Kappa Nu, 1991
Hertz Fellowship, 1987
NSF Fellowship, 1984
Schlumberger Achievement Award, 1984
W.H. Seeley Award, 1984
Angell Scholar, 1980-1984
W. J. Branstorm Prize, 1981

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA - none

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor, IEEE Transactions on Pattern Analysis and Machine Intelligence, 2003-2006
Associate Editor, IEEE Transactions on Image Processing, 1999-2004
Associate Editor, Journal of the Optical Society of America A, 1997-2000

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

*Articles, Journal*


*Conference/Workshop/Symposium Proceedings*


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Payam Heydari

EDUCATION
Ph.D., EE, University of Southern California, 2001
M.S., EE, Sharif University of Technology, Tehran, Iran, 1995
B.S., EE, Sharif University of Technology, Tehran, Iran, 1992

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2010-present
UC Irvine, Associate Professor, 2006-2009
UC Irvine, Assistant Professor, 2001-2006

NON-ACADEMIC EXPERIENCE - none

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Association for Computing Machinery (ACM)
Circuits and Systems Society, Member
Institute of Electrical and Electronics Engineers (IEEE), Senior Member
Solid-State Circuits Society, Member

HONORS AND AWARDS
Best Concept Paper Award, Paul Merage School of Business at UC-Irvine, 2009
School of Engineering Fariborz Maseeh Best Faculty Research Award, 2009
Winner of Business Plan Competition, Paul Merage School of Business at UC-Irvine, 2009
Low-Power Design Contest Award, IEEE Int'l Symp. on Low-Power Electronics and Design, 2008
Best Paper Award Nomination, IEEE RFIC Symposium, June 2008
IEEE Circuits and Systems Society Guillemin-Cauer Award, 2007
Inducted to the 2007 UC-Irvine’s Living Our Values Honor Roll, 2007
Best Paper Award Nomination, IEEE Custom Integrated Circuits Conference, September 2007
Senior Member, IEEE, June 2007
Special Recognition for Outstanding Service, Leadership, and Commitment to IEEE-USA, 2006
Best Paper Award Nomination, IEEE Int’l Symp. on Low-Power Electronics and Design, October 2006
IEEE Circuits and Systems Society Darlington Award, 2005
National Science Foundation Early Career Award, 2005
Teaching Excellence Award, University of California, Irvine, 2005

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, Department Executive Committee, EECS Department, September 2007-present
Associate Chair, Graduate Affairs, EECS Department, September 2007-present
Associate Chair for Graduate Affairs, July 2007-present
Research and Travel Committee Representative, School of Engineering, UCI, 2002-present
Member of Campus-Wide Conflict of Interest Oversight Committee (COIOC), 2008-present
Member of the preliminary exam in Circuits and Devices subcommittee, 2005-present
Member, Center for Embedded Computer Systems (CECS), 2004-present
IEEE Student Branch Counselor, 2003-present
Member, Integrated Nanosystem Research Facility (INRF), 2002-present
Member, Center for Pervasive Communications and Computing (CPCC), 2001-present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Member of Technical Program Committee, IEEE Custom Integrated Circuits Conference, 2006-present
Associate Editor, IEEE TRANS. ON CIRCUITS AND SYSTEMS - I, 2006-present
Reviewer, IEEE Transactions on Microwave Theory and Techniques (TMTT), 2006-present
Reviewer, IEEE Microwave and Wireless Components Letters (MWCL), 2005-present
Member of Technical Program Committee, IEEE Int’l Symposium on Low-Power Electronics and Design, 2004-present
Member of Technical Program Committee, IEEE Int’l Symposium on Quality Electronic Design, 2003-present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


Books, Authored

Conference/Workshop/Symposium Proceedings


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Syed A. Jafar

EDUCATION
Ph.D., Electrical Engineering, Stanford University, 2003
M.S., Electrical Engineering, California Institute of Technology (CALTECH), 1999
B.TECH, Electrical Engineering, Indian Institute of Technology, 1997

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2009-present
UC Irvine, Assistant Professor, 2004-2009

NON-ACADEMIC EXPERIENCE
Qualcomm Incorporated, Senior Engineer, Qualcomm Technology and Ventures Group, August 2003-January 2004
Lucent Bell Labs, Summer Intern, Wireless Research Group, 2001
Hughes Software Systems, Software Engineer, Satellite Networks Division, 1997-1998

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS – IEEE Senior Member

HONORS AND AWARDS
School of Engineering Fariborz Maseeh Outstanding Research Award 2010.
Information Theory Society Paper Award 2009.
ONR Young Investigator Award 2008.
NSF CAREER award 2006.
IEEE GLOBECOM best paper award 2012
Engineering School Excellence in Teaching Award 2012
UCI EECS Professor of the Year 2012.
UCI EECS Professor of the Year 2011.
UCI EECS Professor of the Year 2009.
UCI Engineering School Faculty of the Year 2006.
University of Canterbury Erskine Fellow 2010.
CPCC Best Dissertation Award received by PhD student Tiangao Gou, 2012.
CPCC Best Dissertation Award received by PhD student Viveck Cadambe, 2011.
UCI EECS best student paper award 2009.
Number 1 most cited author in Computer Science among 7904 new entrants to Web of Science database in 2008.
Over 10,000 citations in Google Scholar (h-index 45).
Web of Science: 848 citations in one year (2012).
University Gold Medal at AMU, India 1993
University Merit Scholarship at AMU, India 1992.
SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Associate Chair for Graduate Studies 2012-present
School of Engineering Executive Committee 2010-11
Teaching Assistant Assignment Committee 2009-12
Committee Member, UCI EECS Graduate Admissions, 2007-11
Preliminary Exam committee member (chair for Spring 2007) each year 2004-2012.
Committee Member, UCI EECS Department website, 2004-2005

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor, IEEE Transactions on Information Theory, 2009-12.
Associate Editor, IEEE Communications Letters, 2008-09.
Co-Chair for Communication Theory Symposium, IEEE GLOBECOM 2009.
Co-Chair for MIMO and Space Time Coding Track IEEE VTC 2011.
Finance Chair for IEEE Information Theory Workshop (ITW) 2010.
Technical Program Committee Member regularly for IEEE conferences ICC, ISIT, GLOBECOM
NSF grant review panel member 2006, 2012.

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Hamid Jafarkhani

EDUCATION
Ph.D., Electrical Engineering, University of Maryland, 1997
M.S., Electrical Engineering, University of Maryland, 1994
B.S., Electrical Engineering, Tehran University, 1989

ACADEMIC EXPERIENCE
UC Irvine, Chancellor’s Professor and Conexant-Broadcom Endowed Chair, 2010-present
UC Irvine, Director, Center for Pervasive Communications & Computing, 2010-present
UC Irvine, Chancellor’s Professor, 2009-present
UC Irvine, Professor, 2006-present
UC Irvine, Associate Professor, 2003-2006
UC Irvine, Assistant Professor, 2001-2003
Institute for Systems Research, Research Assistant, 1992-1997

NON-ACADEMIC EXPERIENCE
Broadcom Corporation, Senior Staff Scientist, 2000-2001
AT&T Labs - Research, Principal Technical Staff Member, 2000
AT&T Labs - Research, Senior Technical Staff Member, 1997-2000
Lucent Technologies (Bell Labs Innovations), Internship, 1996

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS - none

HONORS AND AWARDS
Fellow of AAAS, 2010
Conexant-Broadcom Endowed Chair, 2010
Best paper award, Journal of Communications and Networks, 2010
Awarded the title of Chancellor’s Professor, 2009
School of Engineering Fariborz Maseeh Best Faculty Research Award, 2007
UCI Distinguished Mid-Career Faculty Award for Research, 2006-2007
Top 10 most-cited researchers in the field of "computer science", Essential Science Indicators from Thomson Scientific, 1997-2007
Best Paper Award, IEEE Transactions on Wireless Communications: The IEEE Marconi Prize Paper Award in Wireless Communications, 2006
IEEE Fellow, 2006
Sole author of a paper selected by Essential Science Indicators (ESI) as an Emerging Research Front in the field of Engineering, 2006

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Communication and Signal Processing Ph.D. Prelim Exam Committee, 2001-present
Associate Chair for Graduate Affairs, Department of Electrical Engineering and Computer Science, 2005-2007
Graduate Advisor, Department of Electrical Engineering and Computer Science, 2003-2007
School of Engineering Graduate Studies Committee, 2003-present
Deputy Director, Center for Pervasive Communications & Computing, September 2001-present
Director, Networked Systems Program, 2009-2011

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Editor, IEEE Transactions on Wireless Communications, 2007-present
Vice Chair of Technical Program Committee (PHY Track), IEEE Wireless Communications and Networking Conference (WCNC), 2010
Chair, IEEE Data Compression Conference (DCC), 2009
Chair, IEEE Wireless Communications and Networking Conference (WCNC), 2009
Keynote Speaker, World Congress on Computer Science and Information Engineering (CSIE), 2009

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


Books, Authored

Conference/Workshop/Symposium Proceedings

PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME – Alireza Kavianpour

EDUCATION
Ph.D., Computer Engineering, University of Southern California, 1978
M.S., Computer Engineering, Oklahoma State University, 1975
B.S., Electrical Engineering, Shiraz University, 1972

ACADEMIC EXPERIENCE
UC Irvine, Lecturer, 1998-present
DeVry University, Professor, 1990-present
UC Irvine, Researcher, EECS Department, 1988-1998
Sharif University of Technology, Associate Professor, 1978-1988

NON-ACADEMIC EXPERIENCE
Qualcomm, Inc., Consultant, 1996-1999

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
ASEE Member
ACM Member
IEEE Member

HONORS AND AWARDS
PRIDE Recipient (Professional Recognition of Integrity, Dedication and Excellence), DeVry University, 2007
UCI Outstanding Professor Award, 2006, 2004, 2003, and 2002
UCI Excellence in Teaching Award, 2002
Invited Lecturer for the Third College of Microprocessors, European Organization for Nuclear Research (CERN), Switzerland, Sept. 1985
Research and Teaching Scholarship, USC, 1975-1978
Research and Teaching Scholarship, OSU, 1974-1975

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA - none

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA - none

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:

2. "Advance Features of Hardware Description Language (VHDL) for Undergraduate Students"
The 2011 American Society for Engineering Education Conference, ASEE, June 2011, Vancouver, Canada


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Stuart A. Kleinfelder

EDUCATION
Ph.D., Electrical Engineering, Stanford University, 2001
M.S., Electrical Engineering, University of California, Berkeley, 1992
B.S., Computer Science, State University of New York, 1984

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2007-present
UC Irvine, Assistant Professor, 2001-2007
Stanford University, Research Assistant, 1997-2001

NON-ACADEMIC EXPERIENCE
VLSI Physics, Founder, January 1987-2001
University of California, Lawrence Berkeley National Laboratory, Staff Scientist: Physics Division, Staff Engineer: Engineering Division, 1986-2001
Radiation Monitoring Devices, Inc, Consultant, Consultation on radiation imaging sensor design., 2008-2009
Metrolaser, Inc, Consultant, Consultation on a high-speed digital schlieren camera system., 2007-2008
Siolink Inc, Consultant, Interim Chief Technical Officer; cell-phone camera systems, 2004
Nova R&D, Ca, Consultant, Design of scientific instrumentation integrated circuits., 2000
The California Institute of Technology, Ca, Consultant, Design of the Advanced Composition Explorer Satellite radiation hardened matrix VLSI readout circuit. The design was successfully launched with full functionality., 1991-1994
Goddard Space Flight Center, Ca, Consultant, Design of HgCdTe sensor instrumentation., 1993

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
IEEE Nuclear and Plasma Sciences Society, Member
Institute of Electrical and Electronics Engineers, Senior Member
International Society for Optical Engineering, Member

HONORS AND AWARDS
Fariborz Maseeh Teaching Excellence Award, 2005
Teaching Innovator of the Year Award, UCI’s Division of Undergraduate Education, 2002-2003
R&D-100 Award, 1991

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA - none

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Chair, Symposium on Radiation Measurements and Applications, 2008
Co-Editor, International Society for Optical Engineering’s Conference on High Speed Photography and Photonics, 2005
Co-Editor, International Society for Optical Engineering’s 26th International Congress on High Speed Photography and Photonics, 2004
UCI representative, panel member and contributor, Jacobs School of Engineering Sensor Networks Research Review, 2002

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

**Articles, Journal**


**Books, Chapters**

**Conference/Workshop/Symposium Proceedings**


**Reports, Technical**

PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Fadi J. Kurdahi

EDUCATION
Ph.D., Computer Engineering, EE-Systems Dept., University of Southern California, 1987
M.S., Electrical Engineering, EE-Systems Dept., University of Southern California, 1982
Bachelor of Engineering, Electrical Engineering, EE Dept., American University of Beirut, 1981

ACADEMIC EXPERIENCE
UC Irvine, Professor, 1998-present
UC Irvine, Director, Center for Embedded Computer Systems, 2012-present
UC Irvine, Associate Professor, 1993-1998
UC Irvine, Assistant Professor, 1988-1993
Department of EE-Systems, University of Southern California, Research Assistant, 1983-1987

NON-ACADEMIC EXPERIENCE
Morpho Technologies, Technical Advisor, 2002-2006
Morpho Technologies, Member of the Board of Directors, 2000-2005
Morpho Technologies, Founder, VP of Engineering and Chief Technical Officer, 2000-2002
Emulex Corp, Irvine, CA, Consultant, SEU modeling, 2007-2008

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Phi Beta Delta

HONORS AND AWARDS
International Board of Advisors, University of Balamand, Lebanon (member), 2007-present
Invited Scientist, World Economic Forum, 2009
AAAS Fellow, The American Association for the Advancement of Science, 2009
Distinguished Alumnus Award, Faculty of Engineering and Architecture, the American University of Beirut, 2008
Distinguished Arab Expatriate Scientist, Qatar Foundation for Science and Technology, 2007
ISQED Best Paper Award, IEEE International Conference on Quality Electronic Design (ISQED) 2006, 2006
IEEE Fellow, 2005

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
ECE ABET representative for Computer Engineering, 2004-present
ECE Ph.D. Preliminary Exam Committee, 1987-present
ABET lead faculty for CPE, 2005-2006
Executive Committee, 2005-present
ABET committee, 2005-2006
UCI Committee on Academic Personnel, 2006-present
Associate Director, The Center for Embedded Computer Systems, 2005-present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

*Articles, Journal*


*Books, Chapters*


*Conference/Workshop/Symposium Proceedings*


*Letters/Notes*


PROFESSIONAL DEVELOPMENT ACTIVITIES - ABET assessment workshop. Feb 2012
NAME - Chin C. Lee

EDUCATION
PhD, Electrical Engineering, Carnegie-Mellon University, 1979
MS, Electronics, National Chiao-Tung University, 1973
BS, Electrical Engineering, National Chiao-Tung University, 1970

ACADEMIC EXPERIENCE
UC Irvine, Professor, 1994-present
UC Irvine, Associate Professor, 1990-1994
UC Irvine, Assistant Professor, 1984-1990
UC Irvine, Specialist, 1980-1984
Carnegie-Mellon University, Research Associate, 1979-1980
Naval Academy, Instructor, 1970-1971

NON-ACADEMIC EXPERIENCE
Viclite Optical Company, Optical Engineer, 1973-1974
Kemet Corp., Simpsonville, SC, 2011 - present

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Institute of Electrical and Electronics Engineers, Inc. (IEEE), 1974 to present
Tau Beta Pi, 1986 to present

HONORS AND AWARDS
IEEE CPMT (Components, Packaging, and Manufacturing Technology) Society Electronic Manufacturing Technology Award, 2012
IEEE ECTC (Electronic Components and Technology Conference) ten-year Service Award, 2009
IEEE CPMT Society Exceptional Technical Achievement Award, 2007
Listed in Thomson ISI citation data base among 250 highly cited researchers in engineering category in the world, 2004
Fellow, IEEE, 2001
Fellow of the Photonics Society of Chinese Americans, 2001
School of Engineering Outstanding Assistant Professor Award, UCI, 1984
Best Paper Award, IEEE Reliability Physics Symposium, 1979

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Associate Chair, EECS Department, July 2007-August 2009
Director, Materials and Manufacturing Technology graduate program, School of Engineering, 2005 to present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


Fluxless Bonding of Silicon Wafers to Molybdenum Substrates Using Electroplated Tin-rich Solder.


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Henry P. Lee

EDUCATION
Ph.D., Electrical Engineering, University of California, Berkeley, 1989
B.S., Electrical Engineering, University of California, Berkeley, 1983

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2004-present
UC Irvine, Associate Professor, 1996-2004
UC Irvine, Assistant Professor, 1992-1996

NON-ACADEMIC EXPERIENCE
Member of Technical Staff (post-doctoral), 1990-1992
Rainbow Communications, Consultant, 2002-2004
Physical Optics Corp, Consultant, 2000-2003
Intelligent Epitaxy Technology, Consultant, 1998
AT&T Bell Lab, Consultant, November 1996
Bell Communications Research, Red Bank NJ, Consultant, 1992

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS - none

HONORS AND AWARDS
Irvine Research Fellowship, 1993-1994

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA - none

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Program Committee & Session Chair, APOC, 2006
Chair, Asian Pacific Optical Communication Conference (APOC), 2005
Program Committee, IEEE Sensor Conference, 2005
Program Committee, BGPP, 2005
NSF Panel Review, 2005
Chair, Pacific Rim CLEO, 2003
Chair, "Grating Properties II", Bragg Grating Photosensitivity and Pooling of Glass Waveguide (BGPP), 2003
Program committee, Bragg Grating Photosensitivity and Pooling of Glass Waveguide (BGPP), 2003
Session P slider, 'Optical Amplifier', 87th OSA Annual Meeting, 2003
Chair, 10th International conference on MBE, 2000
Technical program committee, Engineering Foundation Conference on “Intelligent Epitaxy II”, 1997
Organizing committee, Ninth International Conference on Molecular Beam Epitaxy, 1996
Technical program committee, TMS Electronic Materials Conference, 1996
Co-Chair, Ninth International Conference on Molecular Beam Epitaxy, on “III-V Growth”, 1996
Co-Chair, TMS Electronic Material Conference, on “Real-time Monitoring and Control”, 1996
Co-Chair, Engineering Foundation Conference on Intelligent Epitaxy, “Pyrometry and
temperature monitoring”, 1995
Co-Chair, Spring 1994 MRS meeting, Symp. B, on “In situ monitoring/control and production
issues”, 1995

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal

P. Z. Dashti, F. Alhassen, H. P. Lee, "Observation of Orbital Angular Momentum Transfer
September 2006.

PRESENTATIONS

Generation of vortices in optical fiber via acousto-optic interaction, LEOS Summer Topical
Meeting, Quebec City, Canada, July 17, 2006 - July 19, 2006.

Quantitative characterization of polarization cancellation for optical devices via bi-direction

Transfer of orbital angular momentum between acoustic and optical vortices in optical fiber,
Optical Fiber Communication Conference (OFC), Anaheim, CA, March 6, 2006 - March 10,
2006.

PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Guann-Pyng Li

EDUCATION
Ph.D., Electrical Engineering, University of California, Los Angeles, 1983
M.S., Electrical Engineering, University of California, Los Angeles, 1982
B.S., Electrical Engineering, National Cheng Kung University, 1978

ACADEMIC EXPERIENCE
UC Irvine, Professor, 1994-present
UC Irvine, Associate Professor, 1990-1994
UC Irvine, Assistant Professor, 1988-1990

NON-ACADEMIC EXPERIENCE
IBM, Thomas J. Watson Research Center, Manager of Advanced Bipolar Technology Group, silicon science and technology, 1986-1988
IBM Thomas J. Watson Research Center, Research staff member, 1983-1986
Industrial Technology Research Institute, Taiwan ROC, Consultant, 1995-present
Qplus Inc, Consultant, 2000-2001
Epson Research & Development, Inc, Consultant, 1998

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Eta Kappa Nu, Member, 1991
IEEE, Member, 1988

HONORS AND AWARDS
UCI Outstanding Engineering Professor of the year in EECS, 2007
Best paper award in 2005 ITC International Telemetering Conference, 2005
UCI Innovators Award, 2005
UCI Outstanding Engineering Professor of the year, 2001
Who’s Who Among America’s Teachers, 1999
Who’s Who Among America’s Teachers, 1998
UCI Outstanding Engineering Professor of the year, 1997
School of Engineering Outstanding Assistant Professor Award, University of California, Irvine, 1990
IBM Research Division Outstanding Contribution Award, 1987
Recipient of NCKU honor student award, 1978
President of Electrical Engineering Student Association, NCKU, 1977

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, SOE Research Strategic Planning committee, 2009-present
SOE Engineering Unit 3 Planning Committee, 2004-present
Director, Integrated Nanosystems Research Facility (INRF), 1998-present
Director, SOE INRF, 1998-present
Material Science Interdisciplinary Program Committee, 1988-present
Committee co-chair, UCOP CCSIP Review, 2009-present
Director, California Institute for Telecommunications and Information Technology (Calit2), 2007-present
Director, Calit2 Irvine division, 2007-present
Director, LifeChips Center, 2006-present
UC SMART Executive Committee member representing Irvine campus, 1998-present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Co-founder, Intelllego LLC., 2006-present
Reviewer, Extramural Funding, NSF, 2006-present
Reviewer, Extramural Funding, NIH, 2004-present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

*Articles, Journal*


*Conference/Workshop/Symposium Proceedings*


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Kwei-Jay Lin

EDUCATION
Ph.D., Computer Science, University of Maryland, 1985
M.S., Computer Science, University of Maryland, 1980
B.S., Electrical Eng, National Taiwan University, 1976

ACADEMIC EXPERIENCE
UC Irvine, Professor, 1997-present
UC Irvine, Associate Professor, 1993-1997
University of Illinois, Associate Professor, 1991-1993
University of Illinois, Assistant Professor, 1985-1991

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
IEEE, Fellow

HONORS AND AWARDS
Member, Phi Tau Phi Scholastic Honor Society of America
Adjunct Professor, National Taiwan University, Taiwan
Adjunct Professor, National Tsinghua University, Taiwan
Visiting Chair Research Fellow, Academia Sinica, Taiwan, 2007-2008
Advisory Committee Member, Institute of Information Science, Academia Sinica, 2006-2008
Keynote Speaker, IEEE 24th International Conference on Advanced Information Networking and Application (AINA 2010), Perth, Australia, April 2010
Keynote Speaker, IEEE International Conference on e-Business Engineering (ICEBE 2010), Shanghai, China, November 10-12, 2010
Keynote Speaker, International Computer Symposium (ICS), Taiwan, 2010

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member of the HSSoE Executive Committee, 2012/2013
Member, Academic Senate Board on Undergraduate Scholarships, Honors & Financial Aids (2008-2011, Chair 2009-2010)

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Co-Chair, IEEE Technical Committee on Business Informatics and Systems, 2003-2011
Editor in Chief, Springer Journal of Service Oriented Computing and Applications (SOCA), 2006-present
Editor in Chief, Software Publication Track, Journal of Information Science and Engineering, 2005-present
Conference Co-Chair, IEEE Conference on Business Informatics, Vienna Austria, 2013
Conference Co-Chair, IEEE International Conference on Service-Oriented Computing and Applications, Taipei, Taiwan, 2012
Conference Co-Chair, IEEE International Conference on Service-Oriented Computing and Applications, Perth, Australia, 2010
General Co-Chair, IEEE International Conference on E-Commerce Technology and Enterprise Computing, 2009
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

*Articles, Journal*


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Athina Markopoulou

EDUCATION
Ph.D., Electrical Engineering, Stanford University, 2003
M.S., Electrical Engineering, Stanford University, 1998
Diploma, Electrical and Computer Engineering, National Technical University of Athens, 1996

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2012-present
UC Irvine, Assistant Professor, 2006-2012
Sprint Advanced Technologies Lab, IP Group, Postdoctoral Member of Technical Staff, 2003

NON-ACADEMIC EXPERIENCE
Arastra Inc, Research Scientist, Member of the Technical Staff, 2005
Cisco Systems, Gigabit Ethernet Switching Group, Research Intern, 2000
Nokia Research Center, Research Intern, 1999
Aloha Networks Inc, Research Intern, 1998
Institut National des Télécommunications Francaises (I.N.T.), Summer intern, 1994

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
IEEE : Senior Member, ACM: Member

HONORS AND AWARDS
NSF CAREER Award

SELECTED SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
NetSys Co-Director, July 2013+

SELECTED SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Regularly serving as Reviewer for funding agencies: NSF, AFOSR.

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


For additional information (e.g. Technical Reports, Presentations, etc) please see detailed CV at: http://www.ece.uci.edu/~athina/materials/markopoulou-cv.pdf

PROFESSIONAL DEVELOPMENT ACTIVITIES - none
Program Chair, IEEE Orange County Section, 2012-present
Assistance to job seekers, California Employment Development Department, 2012
City Council Candidate, Santa Clara, California, 2008
Prison visitor, County of Santa Clara, 2006-2007
Member, Board of Directors, Professional and Technical Consulting Association, 2003
Pro Life Chairman, Knights of Columbus Council 10180, Santa Clara, 1997-1999
Mentor to foster children, Help One Child non-profit, Los Altos, California, 1996-1997

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:
None in this time period

PROFESSIONAL DEVELOPMENT ACTIVITIES
Advanced Summer School of Radioactive Waste Disposal with Social-Scientific Literacy,
University of California at Berkeley (with visit to WIPP site, New Mexico), July 2009

Course work for Engineer in Training and Professional Engineering License, 2003-2004

Courses in IEEE software testing standards, C++, and Java, 2004-2009

Hot Chips conference attendee, Stanford University, 2002-2008

Courses in signal theory and control theory, Santa Clara University, 2001-2002
NAME - Chen Y. Sheu

EDUCATION
Ph.D., University of California, Berkeley, 1986
MSCS, University of California, Berkeley, 1982
BSEE, National Taiwan University, 1978

ACADEMIC EXPERIENCE
UC Irvine, Professor, 1997-present
UC Irvine, Associate Professor, 1993-1997
Rutgers University, Associate Professor, ECE, 1989-1993
Purdue University, Assistant Professor, ECE, 1986-1988

NON-ACADEMIC EXPERIENCE - none

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS - none

HONORS AND AWARDS
IEEE Fellow, 2003
Henry Rutgers Fellowship, Rutgers University, 1989-1991
Outstanding Paper Award, IEEE Computer Society, 1987

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
EECS Executive Committee 2007-2010

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Chair, IEEE Computer Society Technical Committee on Semantic Computing, 2010-present
Chair, IEEE Computer Society Technical Committee on Multimedia Computing, 2004-2010
Editor, Journal of Tools for Artificial Intelligence, 1991-present
Associate Editor, Journal of Software Engineering and Knowledge Engineering, 1990-present
Founding and General Co-Chair, IEEE International Conference on Semantic Computing, 2007-present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Books


Articles, Journal


Book Chapters


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Keyue M. Smedley

EDUCATION
Ph.D., Electrical Engineering (Power Electronics), California Institute of Technology, 1991
M.S., Electrical Engineering, California Institute of Technology, 1987
M.S., Electrical Engineering (Industrial Electronics), Zhejiang University, 1985
B.S., Electrical Engineering (Industrial Control), Zhejiang University, 1982

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2003-present
UC Irvine, Associate Professor, 1998-2003
UC Irvine, Assistant Professor, 1992-1998
Caltech, TA and RA, 1985-1990
Zhejiang University, Lecturer (Assistant Prof.), 1985

NON-ACADEMIC EXPERIENCE
Superconducting Super Collider, Engineer III, 1990-1992

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
IEEE fellow, 2008-Present
Power Sources Manufacturer's Association member, 1997-present
Eta Kappa Nu faculty member, 1994-present

HONORS AND AWARDS
Innovation Award for invention of One-Cycle Control, University of California, Irvine, 2005
SBIR Achievement Award for One-Cycle Control, Inc. Department of Army, Pentagon, 2010

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Director, Power Electronics Laboratory
Chair, Ph.D. Dissertation Committee

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Manager and Primary Investigator, California Energy Commission Fault Current Program, 2007–present
Member, IEEE Newell Award Committee, 2010-present
President, Chinese Scholar Association, 2012-present
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


Conference/Workshop/Symposium Proceedings


PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Arnold L. Swindlehurst

EDUCATION
Ph.D., Electrical Engineering, Stanford University, 1991
M.S., Electrical Engineering, Brigham Young University, 1986
B.S., Electrical Engineering, Brigham Young University, 1985

ACADEMIC EXPERIENCE
Associate Chair for Electrical Engineering, Dept. of Electrical Engineering & Computer Science, UC Irvine, 2009-present
Professor, Dept. of Electrical Engineering & Computer Science, UC Irvine, 2007-present
Professor, Dept. of Electrical & Computer Engineering, Brigham Young University, 2001-2007
Chair, Dept. of Electrical & Computer Engineering, Brigham Young University, 2003-2006
Associate Professor, Dept. of Electrical & Computer Engineering, Brigham Young University, 1997-2001
Visiting Professor, Joint Appointment at Uppsala University, and at the Royal Institute of Technology, 1996-1997
Assistant Professor, Dept. of Electrical & Computer Engineering, Brigham Young University, 1990-1996

NON-ACADEMIC EXPERIENCE
ArrayComm LLC, Vice-President of Research, 2006-2007
ESL, Inc., Electrical Engineer, 1986-1990
Eyring Research Institute, Scientific Programmer, 1983-1984

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS: IEEE

HONORS AND AWARDS
2006 IEEE Communications Society Stephen O. Rice Prize in the Field of Communications Theory for the two-part paper “A Vector-Perturbation Technique for Near-Capacity Multiantenna Multiuser Communication”, IEEE Transactions on Communications, 2005
Engineering Educator Award, Department of Electrical & Computer Engineering, Brigham Young University, 2005
Elevated to Fellow of the Institute of Electrical and Electronics Engineers, 2004
Karl G. Maeser Research and Creative Arts Award, Brigham Young University, 2004
SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Associate Chair, Dept. of Electrical Engineering and Computer Science, 2010-present
Member, Academic Personnel Advisory Committee, Henry Samueli School of Engineering, 2012-present.

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Member, IEEE Signal Processing Society Awards Board, 2012-present
Editor-in-Chief, IEEE Journal on Selected Topics in Signal Processing, 2006-2009
Associate Editor, EURASIP Journal on Wireless Communications and Networking, 2003–2010
Co-organizer and Technical Program Chair, IEEE ICASSP Conference, 2001 and 2008
Officer, Secretary, IEEE Signal Processing Society, 2002-2004

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


PROFESSIONAL DEVELOPMENT ACTIVITIES – none
NAME - Chen S. Tsai

EDUCATION
Ph.D., Electrical Engineering, Stanford University, 1965
M.S., Electrical Engineering, Utah State University, 1961
B.S., Electrical Engineering, National Taiwan University, 1957

ACADEMIC EXPERIENCE
UC Irvine, Chancellor’s Professor, 2008- ; Professor since 1980
Academia Sinica, Founding Director and Distinguished Research Fellow, Institute for Applied Science and Engineering Research, 2000-2002
Carnegie-Mellon Univ., Assistant Professor to Professor of Elec. Eng., 1969-1980
San Jose State Univ., Assistant Professor, 1966-1967

NON-ACADEMIC EXPERIENCE
Research Scientist, Lockheed Palo Alto Research Center, 1966-1969
Consultant to 22 research labs and government agencies in the US, 1972-present
Founding Director, Inst. of Applied Science and Eng Research, Academia Sinica, 2000-2002

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Association for the Advancement of Sciences (AAAS, Fellow 1992)
Institute of Electrical and Electronics Engineers (IEEE, Fellow 1983, Life Fellow 2003)
Optical Society of America (OSA, Fellow 1983)
Russian Popov Society (Honorary Foreign Member 2002)
Institute for Advancement of Engineering (IAE, Fellow 1983)
Society for Photo-optical Instrumentation Engineers (SPIE, Fellow 1987)
Photonics Society of Chinese Americans (PSCA, Fellow 1983)

HONORS AND AWARDS
IEEE UFFC Society Achievement Award, 2013
Chancellor’s Professorship, University of California, Irvine, January 2008-present
Academician of Academia Sinica, Taiwan (Equivalent to US NAS and NAE), 2000
Russian Academy of Engineering Sciences (Foreign Member), 2001
UCI Faculty Senate Distinguished Faculty Lectureship for Research, 1995
National Taiwan University Alumnus Award for Scholarly Research Achievement, 2007
Awarded Chair Professorship at Carnegie-Melon University, 1980
International Microoptics Award, 1995
IEEE UFFC Society Distinguished Lectureship Award, 1987
UC Irvine Lauds/Laurels Award for Distinguished Research, 1987
UC Irvine Engineering Instructor of The Year Award, 1984–1985
The first “Hall of Fame Professor” honored by the graduate students body of EECS, 1989

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member to Chair, Campus Faculty Senate Awards and Honors Committee, 2004-07
Member of School of Engineering Faculty Improvement/Impact Committee, 2003-2007
Chair or Co-chair, Department Faculty Improvement Committee, 2004-present
Member, Executive Committees of School of Engineering, 2007

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor, IEEE Trans. on UFFC, 1980-1992
Member, International Scientific Committee of Acoustooptics, 1998-
Member, International Advisory Committee of Microoptics Conference, 1988-
Reviewer for prestigious journals such as Appl. Phys. Lett., J. of Appl. Phys., Optics Express,
NSF NIRT Panel on Nano-Photonics and NIH Proposal Review Panel

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Encyclopedia

Articles, Journal


Books, Chapters
Guided-Wave Acoustooptic Interactions and Devices, Springer-Verlag, 1990

PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Hemantha K. Wickramasinghe

EDUCATION
Ph.D., Electronic and Electrical Engineering, University College, University of London, 1974
B.S., Electronic and Electrical Engineering, Kings College, University of London, 1970

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2006-present
University College London, Lecturer (tenured) in Electronic and Electrical Engineering (roughly equiv to Assoc Prof), 1978-1983
E.L.Ginzton Laboratory, Stanford University, Research Associate, 1975-1978
Department of Electronic and Electrical Engineering, University College London, Associate Research Assistant, 1974-1975

NON-ACADEMIC EXPERIENCE
IBM Almaden Research Center, IBM Fellow and CTO Science and Technology, 2005-2006
Nanoscale Science & Technology, IBM Almaden Research Center, IBM Fellow & Senior Department Mgr, 2002-2006
Physical Science Dept., IBM T.J. Watson Research Center, Manager, Imaging Science and Measurement Technology, 1996-2002
Manufacturing Research Dept.,IBM T.J.Watson Res Ctr, Manager, Physical Measurements, 1984-1996
United Kingdom Atomic Energy Authority, Harwell, Consultant, on Acoustic Microscopy, October 1980-December 1982

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS - none

HONORS AND AWARDS
Micro/Nano 25 Award, R & D Magazine, 2006
Scientific American 50 award, 2006
Research Division Master Inventor, 1994-2004
APS Joseph F. Keithley Award – for “pioneering contributions to nanoscale measurement science through their leadership in the development of a range of nanoscale force microscopes that have had a major impact in many areas of Physics”, 2000
Appointed IBM FELLOW by IBM Chairman and CEO Lou Gerstner, 2000
Distinguished Corporate Inventor Award, National Inventors Hall of Fame, 1998
National Academy of Engineering, 1998
Designated "Top IBM Inventor", 1997
Elected to IBM Academy of Technology (1993) - for "leadership in transfer of high precision metrology tools to IBM", 1993
IBM Outstanding Technical Achievement, 1992
IBM Outstanding Technical Achievement Award, 1992
IBM Research Division Award for “contributions to liquid particle detector”, 1992
IEEE Field Award (IEEE Morris E. Leeds Award)- for "pioneering contributions to electrical techniques for nanometer-scale measurement of magnetic, electrostatic, thermal and optical properties of surfaces", 1992
Designated "Top IBM Inventor", among top thirteen in the Corporation, 1991
IBM Outstanding Innovation Award for "first dynamic mode AFM with laser sensing of scanning probe", 1991
Vladimir K. Zworykin Premium of IEE (UK) for “Contributions to Scanning Acoustic Microscopy”, 1983
IEEE Trans Sonics & Ultrasonics Group Best Paper Award, 1982

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
The Henry Samueli Endowed Chair, 2006-present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA - none

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

**Articles, Encyclopedia**

**Articles, Journal**


**Conference/Workshop/Symposium Proceedings**

PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME – Homayoun Yousefi’zadeh

EDUCATION
Ph.D., Electrical and Computer Engineering, University of Southern California, 1997
M.S., Electrical Engineering, Tehran Polytechnic University, Tehran, Iran, 1993
B.S., Electrical Engineering, Sharif University of Technology, Tehran, Iran, 1989

ACADEMIC EXPERIENCE
UC Irvine, Associate Adjunct Professor, 2009-present
UC Irvine, Assistant Adjunct Professor, 2003-2009
UC Irvine, Post-Doctoral Research Fellow, 2002-2003
University of Southern California/Information Sciences Institute, Graduate Research Assistant, 1994-1995

NON-ACADEMIC EXPERIENCE
The Boeing Company, Consulting Chief Technologist, 2004-present
TierFleet, Inc., Founder and CTO, 2001-2002
Procom Technology, Inc., Senior Software Engineer, R&D Division, 1995-1996
NEC Electronics, Consulting Engineer, 1995
Iran Air Force (Military Service), Software and Hardware Design Engineer, 1989-1991
OptiJava Project, Embedded Software Design and Business Development, 2001

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
IEEE Senior Member

HONORS AND AWARDS
Marquis Who’s Who, Ninth Publication of Science and Engineering, 2006
Academic Keys of Engineering Who’s Who database, 2005
UC Irvine Faculty Career Award, 2003
University of Southern California, Phi Kappa Phi honor society nominee, 1997
University of Southern California top 5% Ph.D. graduate standing, 1997
University of Southern California First Rank Ph.D. screening examinee, 1995
University of Southern California top 2% EEE graduate standing, 1995
Tehran Polytechnic University, graduated from M.S. program with most honors, 1993
SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA - none

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA

Editor, IEEE Trans. Wireless Communications, 2010-Present
Editor, IEEE/KICS Journal of Communication and Networks, 2010-Present
Referee, IEEE/ACM Trans. on Networking, 2002-Present
Referee, IEEE Trans. on Image Processing, 2003-Present
Referee, IEEE Trans. on Speech and Audio Processing, 2003-Present
Referee, IEEE/ACM Trans. on Neural Networks, 2004-Present
Referee, IEEE Trans. on Wireless Communications, 2003-Present
Referee, IEEE Trans. on Multimedia, 2004-Present
Referee, IEEE Trans. on Automatic Control, 2005-Present
Referee, Wiley Int’l J. of Computer Wireless Communications and Mobile Computing, 2004-Present
Referee, Elsevier Int’l J. of Computer and Electrical Engineering, 2002-Present

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years:


PROFESSIONAL DEVELOPMENT ACTIVITIES – none.
NAME - Michael W. Berns

EDUCATION
PhD, Cornell University, 1968
MS, Cornell University, 1966
BS, Cornell University, 1964

ACADEMIC EXPERIENCE
UC Irvine, Professor, 1976-Present
UC Irvine, Associate Professor, 1972-1976
UC Irvine Photonics Incubator, Director, 1999- present
UC Irvine, The Arnold and Mabel Beckman Professor, 1988-Present
UC Irvine, Beckman Laser Institute and Medical Clinic, Founder- Director, 1982-2003
UC Irvine Center for Biomedical Engineering, Founding Director, 1999-2000
UC Irvine, Department of Developmental and Cell Biology, Chairman, 1976-1981
Moscow State University, Department of Biophysics, Visiting Professor, 1979
UC Irvine, Dept. Dev. and Cell Biology, Vice Chairman, January 1, 1973- June 30, 1976

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Institute for Medical and Biological Engineering
American Society for Lasers in Medicine and Surgery
Optical Society of America
Society for Biology (Great Britain)
American Association for the Advancement of Science, 1964-Present
American Society for Cell Biology

HONORS AND AWARDS
Fariborz Maseeh Outstanding Faculty Teaching Award, Samuei School of Engineering, UC Irvine, 2011
Elected  Fellow: Society of Biology of Great Britain, 2011; AAAS; AIMBE
Elected  Foreign Member Academy of Sciences of the Royal Society of Norway

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Chair, Technology Transfer Committee, 2008-Present
Faculty Evaluation Committees (5), 2007-2011
Promotions and Tenure Committee, 2005-2010
Conflict of Interest Coordinating Committee (COICC), 2010

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Scientific Advisory Board, ICFO (Institute for Photonic Sciences), 2004 - Present
Editorial Review Board Member, Acta Laser Biology Sinica, 2003 - Present
Editorial Review Board Member, Journal of Biomedical Optics, 2000 - Present
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


NAME - Elliot L. Botvinick

EDUCATION
PhD, Bioengineering, University of California, San Diego
MS, Bioengineering, University of California, San Diego
BS, Bioengineering, University of California, San Diego

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, 2006-Present
UC Irvine, Associate Specialist, 2004-2006

NON-ACADEMIC EXPERIENCE
Metronom Health, Inc, Founder, 2009-Present
Scientific Advisory Board-Islet Sciences, Inc, March 21, 2012-Present
Fjord Ventures, Laguna Hills, CA, Consultant, Fjord Ventures April 1, 2011-Present

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Biomedical Engineering Society, intermittent and current, 1998-present
Optical Society of America, multiple leadership positions, April 2009-Present
SPIE International, program committee member, January 2008-Present

HONORS AND AWARDS
2012 Engineering Faculty of the Year for Biomedical Engineering, presented by the UCI Engineering Student Council, February 28, 2012
2011 Chancellor's Award for Excellence in Fostering Undergraduate Research, 2011
Arnold and Mabel Beckman Fellowship, Beckman Foundation, University of California Irvine, 2001-2004

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA -
Member, BioENGINE Masters of Engineering Planning Committee, July 21, 2011-Present
Coordinator, Course Coordinator: BME110 series, September 1, 2010-Present
Advisor, Biomedical Engineering Society, Student Chapter, September 2009-Present
Director, Microscopy Core, LAMMP, Beckman Laser Institute, UCI, 2007-Present
Member, Promotions and Honors Committee for the School of Medicine, May 11, 2010-Present
Member, Medical Scientist Training Program admissions committee, September 1, 2009-Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Chair: Optical Society of America (OSA) Biomedical Optics Division: Technical Group on Optical Trapping, Optical Trapping and Manipulation in Molecular and Cellular Biology
Technical Group in the Bio-Medical Optics Division, ASME International Mechanical Engineering Congress & Exposition,
Organizer: International Society for Advancement of Cytemetry (ISAC), Cytometry Development Workshop
Proposal Referee, NSF BISH/Biophotonics, NSF CAREER award, Biomedical Program, NSF Physical Chemistry, Research Grants Council (RGC) of Hong Kong,

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

*Articles, Journal*


*PRESENTATIONS*


Biophysics of Notch Signaling, Annual meeting of the Biomedical Engineering Society 2012.

Concentration independent modulation of local micromechanics in a fibrin clot, Spring Optics and Photonics Congress, Optical Society of America 2011.

Endothelial cell signaling in response to flow fields applied to subregions of the cell surface, Annual meeting of the Biomedical Engineering Society, St. Louis, MO, October 2, 2008.

Laser Microbeams in the study of cellular mechanics, cell energetics, and mechano signaling, ARC/NHMRC Research Network Workshop, Fluorescence Applications in Biotechnology and Life Sciences (FABLS), University of Queensland, Australia, 2007.

PROFESSIONAL DEVELOPMENT ACTIVITIES – none.
NAME - James P. Brody

EDUCATION
PhD, Physics, Princeton University, 1994
MA, Physics, Princeton University, 1991
BS, Physics, Massachusetts Institute of Technology, 1989

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2007--
UC Irvine, Assistant Professor, 2000-2007
California Institute of Technology, Senior Research Fellow, 1998-2000
University of Washington, Research Assistant Professor, 1996-1998
University of Washington, Senior Fellow, 1994-1996

NON-ACADEMIC EXPERIENCE

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Association for Cancer Research

HONORS AND AWARDS
National Academies Keck Futures Initiative, 2005
National Human Genome Research Institute Genome Scholar Development Award, 2000
Whitaker Foundation Young Investigator Award, 1996

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA

DECADE representative, BME 2012--
Member, University Committee on Research Policy (UCORP), 2011-2012
Co-Chair, Committee on Research Computing and Libraries (CORCL), 2011-2012
Member, Committee on Research Computing and Libraries (CORCL), 2009-2012
Lead Faculty, BME ABET Accreditation Committee, 2009-2010
Chair, BME Undergraduate Committee, 2008-2010
Chair, ENG/BME Graduate Committee, 2000-2003
Chair, SOE-Undergraduate Committee, 2009-2010
Chair, SOE-Graduate Committee, 2002-2003
Chair, UCI Campuswide Honors Program Board, 2003-2004

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Academic Editor, PLoS One, 2012--
Grant Reviewer for NSF, NIH, NIH/NIEHS, Bankhead-Coley Cancer Research Program,
Netherlands Organization for Scientific Research (NWO), Texas Higher Education
Coordinating Board, US Civilian Research and Development Foundation

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

**Articles, Journal**

J. P. Brody, "Age-specific incidence data indicate four mutations are required for human testicular cancers", *PLoS one*, vol. 6, pp. 325978, October 2011.


**Books, Chapters**


**PRESENTATIONS**

Exploring Opportunities for the Integration of Silicon and Biotechnology, 7th International System-on-Chip (SoC) Conference, Newport Beach, CA, November 4, 2009 - November 5, 2009.

Reverse engineering transcriptional Control Systems Using Surface Plasmon Resonance Measurements of DNA/Protein Binding, UC Riverside Bioengineering Colloquium, Riverside, CA, April 29, 2009.


Dynamic Protein Monitoring of DNA-Protein Binding Using Surface Plasmon Resonance Sensors, UCLA Biophotonics Workshop, Los Angeles, CA, October 24, 2008.

**PROFESSIONAL DEVELOPMENT ACTIVITIES** – none
NAME - Zhongping Chen

EDUCATION
PhD, Applied Physics, Cornell University, 1993
MS, Electrical Engineering, Cornell University, 1987
BS, Applied Physics, Shanghai Jiaotong University, 1982

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2005-2011
UC Irvine, Associate Professor, 2001-2005
UC Irvine, Assistant Adjunct Professor, 1997-2001
UC Irvine, Beckman Laser Institute, Department of Surgery, Assistant Researcher, 1995-1996

NON-ACADEMIC EXPERIENCE
OCT Medical Imaging, Inc, Co-Founder and Chairmen of Board of Directors, 2005-Present
Biotechnology Division, US Army Natick RD&E Center, NRC Associate, 1993-1995
Biological Components Corporation (BCC), Director of Research, 1992-1993

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Optical Society of America, Fellow
SPIE, Fellow
The American Institute of Medical and Biological Engineering, Fellow
OSA C.E.K. Mees Medal Committee, Chair, 2009-2010

HONORS AND AWARDS
Fellow, SPIE, 2009
Fellow, Optical Society of America, 2007
Fariborz Maseeh Best Faculty Research Award, UCI School of Engineering, 2006
Fellow American Institute for Medical and Biological Engineering, 2005

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Vice Chair, Dept. of Biomedical Engineering, Beckman Laser Institute, UC Irvine, 2005-2008
HSSoE Representative in UCI Divisional Senate Assembly, 2010-2013

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Editorial Board Member, Biomedical Engineering Letter, 2010 - Present
Editorial Board Member, Journal of Bioengineering & Biomedical Science, 2010 - Present
Founder and Council Member, Head and Neck Optical Diagnostics Society, 2009 - Present
Editorial Board Member, Reports in Medical Imaging, Dove Medical Press, 2008 - Present
Reviewer, Extramural Funding, NIH Study Sessions (average of three sessions/year 2007-2013)
Program Committee Member and Session Chair, Photonics West, (1997-2013)
Chair, Asia Communications and Photonics Conference, December 2010
Chair, C.E.K. Mees Medal Award Committee, Optical Society of America, 2008 - 2010
Treasure Elect, World Association of Chinese Biomedical Engineers (WACBE), 2007 - 2010

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal (10 out of 66 over the last five years)


**Books, Chapters (1 out of 8 over the last 5 years)**


**Conference/Workshop/Symposium Proceedings (1 out of 38)**


**PRESENTATIONS (invited lecture, 2 out of 36 over the last 5 years)**


**PROFESSIONAL DEVELOPMENT ACTIVITIES** - none
NAME - Bernard Choi

EDUCATION
PhD, Biomedical Engineering, The University of Texas at Austin, 2001
MSE - Master's in Science and Engineering, Biomedical Engineering, The University of Texas at Austin, 1998
BS, Biomedical Engineering, Northwestern University, 1996

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2011-Present
UC Irvine, Assistant Professor, 2006-2011
UC Irvine, Associate Specialist, 2001-2005

NON-ACADEMIC EXPERIENCE
National Institutes of Health - mail reviewer for the NIH Vaccines Against Microbial Diseases (VMD) Study Section, October 13, 2011-October 14, 2011

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS - none

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Biomedical Engineering Society (BMES), 2011-Present
American Society for Engineering Education (ASEE), 2011-Present
Optical Society of America (OSA), 2003-Present
American Society for Laser Medicine and Surgery (ASLMS), 1998-Present
Society for Photo-Instrumentation Engineers (SPIE), 1997-Present

HONORS AND AWARDS
Honoree for Excellence in Undergraduate Education, Henry Samuei School of Engineering, University of California, Irvine, 2012-2013
Faculty of the Year, Department of Biomedical Engineering, Engineering Student Council, University of California, Irvine, 2012-2013; 2009-2010; 2008-2009
Chancellor's Award for Excellence in Fostering Undergraduate Research, Chancellor's Office, University of California, Irvine, 2007
Beckman Fellowship, Arnold and Mabel Beckman Foundation, University of California, Irvine, August 1, 2002-July 31, 2005

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Chair, Undergraduate Studies Committee, Henry Samuei School of Engineering, 2011-Present
Associate Chair of Undergraduate Studies, Department of Biomedical Engineering, 2011-Present
Member, Ad hoc committee on School of Engineering curriculum reform, 2011-2012
Member, UCI Council on Educational Policy (CEP), 2010-Present
Member 2009-2011. Chair 2011-Present, Undergraduate studies committee, Department of Biomedical Engineering
SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Co-Chair, Conference on Photonics in Dermatology and Plastic Surgery, part of SPIE’s
    International Symposium on Biomedical Optics, 2006 - Present
Chair, Optics in Biology & Medicine subcommittee, OSA Frontiers in Optics 2012 meeting
Co-Chair, Experimental & Translational Research session, ASLMS Annual Meeting, 2011-2012
Session Chair, Biomedical Engineering Society annual meeting, 2011
Chair, Optical Society of America Therapeutic Laser Applications Technical Group, 2008 - 2011
Organizer and Guest Co-Editor, Special topics issue of Journal of Biomedical Optics, on Optical
    Methods in Vascular Biology and Medicine, 2010

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

    Articles, Journal (36 total during review period)

O. Yang, B. Choi, "Laser speckle imaging using a consumer-grade color camera", Optics Letters,

S. White, R. Hingorani, R. Arora, C. Hughes, S. George, B. Choi, "Longitudinal In Vivo
    Imaging to Assess Blood Flow and Oxygenation in Implantable Engineered Tissues", Tissue

T. B. Rice, S. D. Konecky, A. Mazhar, D. J. Cuccia, A. J. Durkin, B. Choi, B. J. Tromberg,
    "Quantitative determination of dynamical properties using coherent spatial frequency domain

O. Yang, D. Cuccia, B. Choi, "Real-time blood flow visualization using graphics processing unit",

    Books, Chapters

B. Choi, "Wound Healing", in J. Popp et. al. (Eds.), Handbook of Biophotonics, Vol. 2:

    Conference/Workshop/Symposium Proceedings

    presented at the Optical Society of America Imaging & Applied Optics Congress, Monterey, CA,
    Jun. 2012 (peer-reviewed paper STh3B).

    PRESENTATIONS

B. Choi (plenary), “Camera-Based Functional Imaging of Tissue Hemodynamics,” BiOS Hot
    Topics, presented at Photonics West Symposium, (San Francisco, CA), Feb. 2013.

PROFESSIONAL DEVELOPMENT ACTIVITIES - none
Biography: Michelle Digman is Assistant Professor in the Department of Biomedical Engineering at the University of California Irvine. She is currently Co-equity advisor for the Henry Samueli School of Engineering, the Co-I of the Laboratory for Fluorescence Dynamics (a P41 NIH Center) and Director of W.M. Keck Nanoimaging Lab. She received her MS and PhD in Chemistry from University of Illinois at Chicago and did her postdoctoral work at the University of Illinois, Urbana-Champaign in the Department of Physics.

Dr. Digman is a Scialog Fellow and has won several awards including the Hellman Fellowship, the Fluorescence Young Investigator Award from the Biophysical Society, the Faculty Innovation in Teaching award and has received the Henry Samueli Career Development Chair. She has coauthored over 90 peer reviewed manuscripts and 6 book chapters. Her current research interest focuses on quantitative spatial and temporal correlation spectroscopies, protein dynamics during cell migration, characterizing metabolic alterations in cells and tissues, and developing novel imaging technologies. In addition to research and teaching, Dr. Digman is passionate about community outreach. She initiated the outreach program for minority a community college students and outstanding high school students called Undergraduate Student Initiative for Biomedical Research (USIBR), which has been in operation since 2011. Her goals are to continue with a strong, collaborative and productive laboratory engaging in growth and development of her research group through targeted teaching, mentoring and aiding in the strategic growth of the University though service, increase diversity initiatives and collaboration.
NAME - Enrico Gratton

EDUCATION
PhD, University of Rome, 1969

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2006-present
Univ. of Illinois, Urbana-Champaign (UIUC), Adjunct Professor, 2006 - present
UIUC, Professor, 1989 – 2006
UIUC, Associate Professor, 1984 – 1989
UIUC, Assistant Professor, 1978-1984

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Biophysical Society
American Physical Society
Optical Society of America

HONORS AND AWARDS
2005: Awarded the "6th Annual MSPAC Outstanding Advisor Award" by the Medical Scholars Program Advisory Committee of the University of Illinois at Urbana-Champaign, 8/11/2005.
2005: Awarded the "Gregorio Weber Award for Excellence in Fluorescence Theory and Application" by the Biological Fluorescence Subgroup, Long Beach, CA.

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
 Academic Personnel Advisory Committee

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Scientific Advisory Board (Fachbeirat), the Max Planck Institute for Biophysical Chemistry, 2004-present.
CNR, Institute of Biology, Genoa, Italy, 2001-present
Editorial Board Member “Methods and Applications in Fluorescence, August 2012 – Present.
Associate Member of Center for Epigenetics & Metabolism, August 2012 – Present.
Board Member, Euro-BioImaging Independent Evaluation Board, March 2013 – Present.
Member of various NIH Study Sections.
NIH Member of Advisory Committee for LAMMP.

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

1. Keenan Torno, Belinda K Wright, Mark R Jones, Michelle A Digman, Enrico Gratton, and Michael Phillips. Real-time analysis of metabolic activity within lactobacillus acidophilus by
Ottavia Golfetto, Elizabeth Hinde, and Enrico Gratton. Laurdan fluorescence lifetime discriminates Cholesterol content from changes in fluidity in living cell membranes. Biophys J. 2013; 104(6): 1238-1247. PMCID: PMC3602759
Elizabeth Hinde, Michelle A Digman, Klaus M Hahn, and Enrico Gratton. Millisecond spatiotemporal dynamics of FRET biosensors by the pair correlation function and the phasor approach to FLIM. Proc Natl Acad Sci USA. 2013; 110(1): 135-140. PMCID: PMC3538204

PROFESSIONAL DEVELOPMENT ACTIVITIES
NAME - Anna Grosberg

EDUCATION
Postdoctoral Fellow, Bioengineering, Harvard University
PhD, Bioengineering, California Institute of Technology, 2008
BEng, Biomedical Engineering, University of Minnesota, 2002
BEng, Chemical Engineering, University of Minnesota, 2002

ACADEMIC EXPERIENCE
UC Irvine, 2011-Present

NON-ACADEMIC EXPERIENCE

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Heart Association, 2012-Present
Biomedical Engineering Society, 2010-2012
Material Research Society, 2009-2011
AIChE, University of Minnesota, Chemical Engineering, National relations officer, 2000-2001

HONORS AND AWARDS
Second Place: Postdoc in IVAM Annual Student/Postdoctoral competition, 2011-Present
Society of Toxicology IVAM Specialty Section MB Research Award for Distinction in Practical in Vitro and Alternative Toxicology Methods, 2011-Present
Society of Toxicology RSESS Postdoctoral Award, 2011-Present
The Safety Pharmacology Society Jr. Investigator Travel Award, 2010-Present
The Ernest E. Sechler Memorial Award in Aeronautics, Awarded to a student who has made the most significant contribution to the teaching and research effort of GALCIT., GALCIT, CalTech, Pasadena, CA, June 2008-Present
The Hans G. Hornung Prize, Awarded to a student advised by Aeronautics faculty for the best oral PhD defense presentation., GALCIT, CalTech, Pasadena, CA, June 2008-Present

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Faculty Search Committee (LFD) 2013
Qualifying Exam Committee (3 students)

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
AHA Go Red For Women Board (2013)

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years
Articles, Journal


PROFESSIONAL DEVELOPMENT ACTIVITIES

2010 Johns Hopkins University Institute for Computational Medicine NHLBI Short Course.
NAME - Jered B. Haun

EDUCATION
PhD, Bioengineering, University of Pennsylvania, 2008
MS, Biomedical Engineering, The Johns Hopkins University, 2003
BS, Chemical Engineering, University of Minnesota, 2000

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, 2011-Present
Chao Family Comprehensive Cancer Center Member, 2011-Present
UC Irvine, Assistant Project Scientist, 2011-Present
Department of Radiology and Center for Systems Biology, Massachusetts General Hospital, Postdoctoral Fellow, 2008-December 31, 2010
Department of Bioengineering, University of Pennsylvania, Graduate Researcher, 2002-2008
Department of Biomedical Engineering, The Johns Hopkins University, Graduate Researcher, 2000-2002
Department of Chemical Engineering and Materials Science, University of Minnesota, Undergraduate Researcher, 1999-2000

NON-ACADEMIC EXPERIENCE

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Association for the Advancement of Science (AAAS)
American Chemical Society (ACS)
Biomedical Engineering Society (BMES)

HONORS AND AWARDS
NRSA Postdoctoral Fellowship, National Cancer Institute, 2010-2011
Leadership Award, Department of Bioengineering, University of Pennsylvania, 2002-2004
British Petroleum Exploration Scholarship, University of Minnesota, 1999-2000
Tau Beta Pi Engineering Honors Society, 1999-2000
Iron Range Scholarship, University of Minnesota, 1996-1998

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Graduate committee member, organized recruitment events

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


Books, Chapters


PRESENTATIONS

Small Tools to push the limits of cancer diagnostics, Breast Oncology Program, University of California, San Francisco, November 2012.

Novel nanomaterial targeting approaches for molecular sensing and imaging, Laser Microbeam and Medical Program (LAMMP) seminar series, Beckman Laser Institute, University of California, Irvine, May 2012.

Microdevice Platforms to Enable Proteomic Analysis of Clinical Cancer Specimen, Physical Science-Oncology Center (PS-OC), University of California, Berkeley, October 2011.

PROFESSIONAL DEVELOPMENT ACTIVITIES - none
NAME - Elliot Hui

EDUCATION
Postdoctoral Fellow, Health Sciences and Technology, Massachusetts Institute of Technology
PhD, Electrical Engineering, University of California, Berkeley, 2002
BS, Physics, EECS, Massachusetts Institute of Technology, 1994

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, 2008-present

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
BMES, 2009-Present

HONORS AND AWARDS
Best Junior Faculty Presentation, IEEE EMBS Micro and Nanotechnology in Medicine
Conference, Maui, Hawaii, December 7, 2012
National Institutes of Health Ruth L. Kirschstein NRSA Postdoctoral Fellowship, 2004-2006
National Science Foundation Graduate Fellowship, 1996-1999

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, Undergraduate Committee, Biomedical Engineering, September 2009-Present
Member, Faculty Search Committee, January 2012-June 2012
Member, Masters of Engineering Planning Committee, May 2011-June 2012
Chair, Preliminary Examination Committee, April 2, 2010-June 7, 2010
Member, Preliminary Examination Committee, 2009-2012
Chair, Biomedical Engineering Seminar Series, June 2009-May 2010
Member, Faculty Search Committee, Biomedical Engineering, January 2009-May 2009
Member, MSTP Admissions Committee, September 2008-May 2009
Member, Data, Benchmarking and Measures of Excellence, Strategic Planning Committee for
the UCI Henry Samueli School of Engineering, January 2009-May 2009

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Board of Advisors, Society for Lab Automation and Screening, January 2013 - Present
Systems, Journal of Micro and Nano-systems, Analyst, Biomicrofluidics, Sensors and
Topics in Quantum Electronics, Applied Physics Letters
Chair, SLAS Conference, Micro/Nano Technology Track, February 8, 2012 - January 16, 2013
Chair, BMES Annual Meeting, Cell-Cell Interactions Session, October 24-27, 2012
Co-Chair, SLAS Conference, Micro/Nano Technology Track, October 2011 - February 2012
Session Chair, LabAutomation Conference, July 2010 - February 2011
Program Committee Member, Micro/Nano Sensors and Actuators, IEEE-NEMS Conference,
February 20, 2011 - February 23, 2011
Session Chair, Engineering Cell Biology III, August 9, 2009 - August 12, 2009
Session Chair, 10th Annual UC Systemwide Bioengineering Symposium, June 19, 2009 - June
21, 2009
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

**Articles, Journal**


**Books, Chapters**

**Conference/Workshop/Symposium Proceedings**


**INVITED PRESENTATIONS**


Spatial and temporal control of the cellular microenvironment, Departmental Seminar, Department of Bioengineering, University of Illinois, Chicago, March 15, 2012.

Manipulating and Understanding the Spatial Organization of Engineered Tissues, MEPTEC Medical Electronics Symposium, Tempe, AZ, September 27, 2011.

NAME - Tibor Juhasz

EDUCATION
Postgraduate Training, Department of Physics, University of California, Irvine 1987-1990
Ph.D. in Physics, JATE University of Szeged, 1986
Diploma in Physics, JATE University of Szeged, 1982

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2004-Present
UC Irvine, Assistant Research Scientist, 1990-1995
UC Irvine, Postdoctoral Researcher, 1987-1990
Biomedical Engineering and Kellogg Eye Center, University of Michigan, Associate Professor, September 1998-September 2004
Kellogg Eye Center and Center for Ultrafast Optical Sciences, University of Michigan, Senior Associate Research Scientist, September 1996-September 1998
Kellogg Eye Center and Center for Ultrafast Optical Sciences, University of Michigan, Visiting Scientist, March 1996-August 1996
Applied Physics and German Cancer Research Institute, University of Heidelberg, Visiting Professor, May 1994-June 1994
Laboratory for Laser Energetics, University of Rochester, Research Assistant, January 1987-July 1987
Dept of Experimental Physics Technical University of Budapest, Research Assistant, September 1982-December 1986

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Physical Society (APS)
Association for Research in Vision and Ophthalmology (ARVO)
International Society of Optical Engineering (SPIE)
Optical Society of America (OSA)

HONORS AND AWARDS
Visionary Honoree, Foundation Fighting Blindness, 2012
Innovation Prize, Berthold Leibinger, 2002

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, Faculty Search Committee, Biomedical Engineering, SOM, UCI, 2009
Member, Ad hoc merit review committees, Biomedical Engineering, SOM, UCI, 2008-2009
Member, Award Committee, Biomedical Engineering, SOM, UCI, 2007-2009
Member, Biomedical Engineering Undergraduate Education Committee, SOM, UCI, 2004-2007
Henry Samueli School of Engineering Representative, Divisional Academic Senate Assembly, UCI, 2007-2009

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Member, SPIE BIOS Ultrafast Biotechnology, Program Committee, 2003 - Present
Co-Chair, 4th International Conference on Femtosecond Lasers in Ophthalmology, 2011
Member, NIH NEI proposal review panels, 2007 - 2008

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


NAME - Arash Kheradvar

EDUCATION
PhD, Bioengineering, California Institute of Technology, 2006
MD, Tehran University of Medical Sciences, 2000

ACADEMIC EXPERIENCE
UC Irvine, Assistant Professor, 2010-Present
University of South Carolina, Assistant Professor of Mechanical Engineering, Medicine and Cell Biology & Anatomy, October 2007-October 2010
California Institute of Technology, Postdoctoral Scholar, Cardiovascular and Biofluid Dynamics Laboratory, January 2007-October 2007
California Institute of Technology, Graduate research assistant, Cardiovascular and Biofluid Dynamics Laboratory, March 2002-November 2006
Tehran University of Medical Sciences, Research Fellow: Immunogenetics Laboratory, Department of Immunology, January 2000-March 2002
Tehran University of Medical Sciences, Medical Student, February 1993-August 2000

NON-ACADEMIC EXPERIENCE
WALVE, Corp, Stockholder or Partnership Interest, WALVE corp is a start up heart valve company, 2011-Present
FOLDA, LLC, Stockholder or Partnership Interest, FOLDA is a heart valve startup company, 2010-Present
Ultrawave Labs, Inc, Consultant and Advisory Board, 2009-Present
Siemens Healthcare, Consultant and Advisory Board, 2008-2010
Edwards Lifesciences, Consultant and Advisory Board, 2004-2005

HONORS AND AWARDS
2013 Fellow, American Heart Association
Finalist for the 2010 Outstanding Freshman Advocate Award, University of South Carolina, Columiba, SC, 2010
Vivien Thomas Young Investigator Award Finalist, American Heart Association at the AHA Scientific Sessions, Orlando, Florida, 2009
Benjamin M Rosen Graduate Fellowship, Caltech, Pasadena, CA, 2002-2006
6th National Iranian Students Book Competition, 2000

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, Graduate Admission Committee, January 1, 2010-Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Track chair for Structural Heart Disease, ASME 6th Frontiers in Biomedical Devices Conference & Exhibition, American Society of Mechanical Engineers, 2011 - Present
SELECTED PUBLICATIONS AND PRESENTATIONS


NAME - Michelle Khine

EDUCATION
PhD, Bioengineering, University of California, Berkeley and San Francisco, 2005
MS, Mechanical Engineering, University of California, Berkeley, 2001
BS, Mechanical Engineering, University of California, Berkeley, 1999

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2011-current
UC Irvine, Assistant Professor, 2009-2011
University of California, Merced, Assistant and Founding Professor, 2006-2009

HONORS AND AWARDS
Fast Company Magazine ‘100 Most Creative People in Business’, 2011
Marie Claire Magazine 1 of 15 ‘Women on Top’ (November issue), 2011
Nominated for World Technology Award for Materials Science, 2011
SLAS 1 of ‘10 Innovation Finalists’, 2010
Forbes’ Magazine named 1 of 10 ‘Revolutionaries’ for their ‘world-changing ideas’, 2009
MIT Technology Review’s TR35, 2009
Microsystems and Engineering Applications (MESA) Institute Fellowship, Sandia National Laboratory, 2004-2005
Jack and Lynne Lloyd Fellowship, 2003-2004
NIH Training Grant, 2001-2003
D. J. Pompeo Memorial Fellowship, 2000-2003
Dean’s Fellowship, 2001-2002
California State Graduate Fellowship, 1999-2001
AutoDesk Scholarship Award, 2000
World Speed Record, Human Powered Vehicle: Women’s Low Altitude Tandem 600/200m Sprint, 2000
Cooper Union, Full Scholarship, 1994-1996

PUBLICATIONS AND PRESENTATIONS from the past five years: Articles, Journal


NAME - Frithjof Kruggel

EDUCATION
Habilitation (Experimental Neurology) University of Leipzig, Leipzig (Germany), 2000
Ph.D. (Cognitive Neuroscience), Ludwig-Maximilian-University, Munich (Germany), 1989
M.D. Ruhr-University Bochum, Bochum (Germany), 1987
M.S. (Chemistry) Ruhr-University, Bochum (Germany). 1983

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2005-present.
Interdisciplinary Center for Clinical Research, Senior Researcher, 2005.
University of Leipzig, Professor, 2002-2004 (on leave from MPI)

NON-ACADEMIC EXPERIENCE
Bogenhausen City Hospital, M.D., 1989-1991.

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
M.D. Association, Lower Saxony, Germany.

HONORS AND AWARDS
Venia legendi, Member of the Faculty of Medicine, University of Leipzig (Germany), 2001.
Graduate Fellowship, Max-Planck-Gesellschaft, Munich (Germany), 1987-1989.

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Graduate Advisor, Dept of Biomedical Engineering, 2007-present
Co-Chair, Dept of Biomedical Engineering, 2007-present
Chair, HSSoE Graduate Studies Committee, 2010-2011.
BME Representative, HSSoE Executive Committee, 2006-present.
HSSoE Representative, UCI Graduate Council, 2012.
Advisory Board, UCI Center for Cognitive Neuroscience, 2006-present.

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Project advisor, European Commission, 5th-7th Framework Programme
Project reviewer for several national and international organizations
Editorial Review Board Member: Medical Image Analysis 2000-present.
SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


NAME - Abraham P. Lee

EDUCATION
PhD, Mech. Engineering, University of California at Berkeley, 1992
MS, Mech. Engineering, University of California at Berkeley, 1989
BS, Power Mech Engr, National Tsing Hua University, 1986

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2002-2011
Center for Microtechnology, Lawrence Livermore National Laboratory (LLNL), Postdoctoral Engineer, 1992-1995

NON-ACADEMIC EXPERIENCE
DARPA-Industry Micro/nano Fluidics Fundamentals Focus (MF3) Center, Director, 2006-Present
Office of Technology and Industrial Relations, National Cancer Institute (NCI), Senior Technology Advisor, 2001
Center for Microtechnology, Lawrence Livermore National Laboratory (LLNL), Principal Investigator, Group Leader, 1992-1999
SFC Fluidics, Inc, Consultant, January 2005-Present

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
AIMBE (fellow), ASME (fellow), BMES, IEEE

HONORS AND AWARDS
Finalist for Innovation Award, Association of Laboratory Automation (ALA), 2010
2009 Pioneers of Miniaturization Prize, sponsored by Lab on a Chip and Corning, 2009
Elected Fellow, AIMBE 2006, ASME 2009
2008 Chancellor's Award for Excellence in Fostering Undergraduate Research, May 2008
Biomedical Engineering Professor of the Year, Engineering Student Council, February 2007
Engineering Directorate Award for “Excellence in Publications”, Lawrence Livermore National Laboratory (LLNL), November 2000
Federal Laboratory Consortium Award for Excellence in Technology Transfer, Mechanical Release Mechanism for Aneurysm Treatment, 1998, 1999

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Associate Chair, Biomedical Engineering Department, September 2003-September 2008
William J. Link Professor and Chair, Department of Biomedical Engineering, 2010-Present
Biomedical Engineering Department, Graduate Advisor, July 2003-July 2008
Faculty Chair, Henry Samueli School of Engineering, September 2008-June 2010

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Associate Editor, Lab on a Chip, October 2011 - Present
Scientific Advisory Committee Member, National Health Research Insititute, Taiwan, 2003 - Present
Chemical and Biological Microsystems Society Board Member, 2011-present
Fellow, American Society of Mechanical Engineering (ASME), January 2010
Associate Editor, Journal of Microelectromechanical Systems (JMEMS), 2003 - 2008
Founding Chair, ASME Frontiers in Biomedical Devices Conference, 2006-2010
Fellow, American Institute of Medical and Biological Engineering (AIMBE), March 2006
Editor, Proceedings of IEEE, Special Issue on MEMS and Microfluidics for Medical Applications, vol.92, number 1, January 2004
Editor for special journal issue on biomedical applications of MEMS and microfluidics published, IEEE, December 2003

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal

Yu-Hsiang Hsu, Monica L. Moya, Parinaz Abiri, Christopher C.W. Hughes, Steven C. George and Abraham P. Lee. Full range physiological mass transport control in 3D tissue cultures , Lab Chip, 2013,13, 81-89 .


PRESENTATIONS

PROFESSIONAL DEVELOPMENT ACTIVITIES – none
NAME – Chang Liu

EDUCATION
Ph.D, Chemistry, The Scripps Research Institute, 2009
BA, Chemistry, Harvard University, 2005

ACADEMIC EXPERIENCE
Assistant Professor, Department of Biomedical Engineering, University of California at Irvine, 2013-present
Fellow, Miller Institute for Basic Research in Science, University of California at Berkeley, 2009-2012

NON-ACADEMIC EXPERIENCE

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS

HONORS AND AWARDS
Miller Research Fellowship, 2009
Fannie and John Hertz Foundation Fellowship, 2005
National Science Foundation Graduate research Fellowship, 2005
The Scripps Research Institute Dean’s Fellowship Award, 2005
Blumberg Creative Science Award (for undergraduate research), 2005
Pfizer Synthetic Organic Chemistry Undergraduate Research Fellowship, 2004
Harvard College Research Scholarship, 2003
John Harvard Scholarship, 2002
United States Presidential Scholar, 2001

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Graduate admissions committee, Department of Biomedical Engineering, University of California at Irvine, 2013
Graduate admissions committee, Center for Complex Biological Systems, University of California at Irvine, 2013

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years


Qi L, Lucks JB, Liu CC, Mutalik VK, Arkin AP. Engineering Naturally Occurring Trans-


**PROFESSIONAL DEVELOPMENT ACTIVITIES**
NAME - Wendy Liu

EDUCATION
Postdoctoral Fellow, Children’s Hospital Boston and Massachusetts Institute of Technology
PhD, Biomedical Engineering, The Johns Hopkins University, 2007
S.B., Materials Science and Engineering, Massachusetts Institute of Technology, 2000

ACADEMIC EXPERIENCE
Dept. of Biomedical Engineering, UC Irvine, Assistant Professor, 2010-2011
Dept. of Biomedical Engineering, The Johns Hopkins Univ., Graduate Researcher, 2000-2007
Dept. of Biomedical Engineering, Columbia University, Undergraduate Researcher, 1999

NON-ACADEMIC EXPERIENCE
Postdoctoral Research Scientist, Arsenal medical 2007-2008

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS
None

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
American Heart Association, 2012-Present
Society for Biomaterials, 2011-Present
Biomedical Engineering Society (BMES), 2005-Present

HONORS AND AWARDS
BMES Cell and Molecular Bioengineering Annual Conference Rising Star Award
National Institutes of Health, New Innovator Award 2012
National Science Foundation Graduate Research Fellowship, 2000-2003
Whitaker Foundation Graduate Research Fellowship (declined), 2000

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Member, Preliminary Exam Committee, Tissue Engineering, May 2011 and May 2012
Member, Faculty Search Committee, ELCACT, January 1, 2011-May 1, 2011
Member, Graduate Committee, January 1, 2011-Present

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Grant Proposal Reviewer (2011-present): NIH Interdisciplinary Molecular Sciences and Training, Bioengineering SBIR/STTR, American Heart Association Vascular Wall Biology Basic Science, NSF Biomechanics and Mechanobiology Program, UC Irvine, Institute for Clinical and Translational Research

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

*Articles, Journal*


*Books, Chapters*


NAME - Zoran Nenadic

EDUCATION
Postdoctoral Fellow, Mechanical Engineering, California Institute of Technology (CALTECH), 2001-2005
DSc, Systems Science and Mathematics (SSM), Washington University, 2001
MS, SSM, Washington University, 1998
Diploma (5 year program), Mechanical Engineering, Belgrade University, 1995

ACADEMIC EXPERIENCE
UC Irvine, Associate Professor, 2011-Present
UC Irvine, Assistant Professor, 2005-2011
CALTECH, Visiting Associate, May 2005-April 2006

NON-ACADEMIC EXPERIENCE

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
The Institute of Electrical and Electronics Engineers (IEEE), Senior Member, April 2012-Present
IEEE Engineering in Medicine and Biology Society (EMBS), January 2006-Present
The Society for Neuroscience (SfN), 2003-Present
IEEE, Member, January 2006-April 2012

HONORS AND AWARDS
IEEE Senior Member, April 2012-Present
Faculty Early Career Development (CAREER) Award, National Science Foundation (NSF), April 1, 2011-March 31, 2016
Center for Complex Biological Systems Opportunity Award, UC Irvine, 2008
Best Paper Competition Finalist, IEEE EMBS, 2007
Faculty Career Development Award, UC Irvine, 2007
Research Assistantship, Washington University, Department of SSM, 1996-2001
Student Fellowship, The 4th International Conference on Cognitive and Neural Systems, Boston University, 2000
Travel Fellowship, The Annual Computational Neuroscience Meeting, Brugge, Belgium, 2000
Research Fellowship, Republic of Serbia, Ministry of Science and Technology, 1995-1996
Outstanding Student Award, Faculty of Mechanical Engineering, University of Belgrade, 1995

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
ABET Lead Faculty, January 2012-Present
Undergraduate student committee (BME), 2009-Present
Examiner, BME preliminary exam (Mathematics), 2005-Present
BME liaison, Committee on computing (HSSOE), 2006-Present
Standing member, ICTS, UC Irvine, Pilot Project Awards Program, review panel, 2011-2012

SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA
Editorial Review Board Member, Journal of Biosensors & Bioelectronics, 2010 - Present
Program Committee Member, 2nd International Conference on Pattern Recognition Applications and Methods (ICPRAM), February 15, 2013 - February 18, 2013
Reviewer, Extramural Funding, NSF, December 6, 2012 - December 7, 2012
Chair, 34th Annual International Conference of the IEEE EMBS: Brain-Machine Interfaces - V, August 28, 2012 - September 1, 2012
Program Committee Member, 1st ICPRAM, February 6, 2012 - February 8, 2012
Co-Chair, 33rd Annual International Conference of the IEEE EMBS: Biomedical Signal Classification: Neurological Data, August 30, 2011 - September 3, 2011
Co-Chair, 33rd Annual International Conference of the IEEE EMBS: Brain-Machine Interfaces: III, August 30, 2011 - September 3, 2011

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Articles, Journal


Conference/Workshop/Symposium Proceedings


PRESENTATIONS

Towards Neural Rehabilitation: Brain-Computer Interface Research at the University of California, Irvine, The SCI Special Fund "Grand Finale" Luncheon, SCI Special Fund, Newport Beach, CA, November 1, 2012.

Brain-computer interface controlled robotic gait orthosis, IEEE EMB/CAS/SMC Workshop on Brain-Machine-Body Interfaces, San Diego, CA, August 2012.

PROFESSIONAL DEVELOPMENT ACTIVITIES

Program Assessment Workshop, Tempe, AZ, February 18, 2012
NAME - William C. Tang

EDUCATION
B.S.  EEECS, University of California at Berkeley, 1980
M.S.  EEECS, University of California at Berkeley, 1982
Ph.D. EEECS, University of California at Berkeley, 1990

ACADEMIC EXPERIENCE
UC Irvine, Professor, 2002 – present

NON-ACADEMIC EXPERIENCE
Research Projects Agency, Arlington, VA
1996 – 1999  Supervisor, MEMS Technology Group, Jet Propulsion Laboratory, Pasadena, CA
1990 – 1993  Research Engineering Senior, Ford Research Laboratory, Dearborn, MI
1986 – 1990  Postgraduate Researcher, University of California, Berkeley, CA
1982 – 1984  Associate Engineer/Scientist, IBM Corp., General Products Division, San Jose, CA
1981 – 1982  Member of Technical Staff, TRW, Inc. Redondo Beach, CA

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Senior Member, the Institute of Electrical and Electronics Engineers
Fellow, the Institute of Physics
Chartered Physicist, the Institute of Physics
Fellow, American Institute for Medical and Biological Engineering

HONORS AND AWARDS
Fariborz Maseeh Outstanding Faculty Teaching Award, 2010
Chancellor's Award for Excellence in Undergraduate Research, 2006
Engineering Faculty of the Year, 2005
NASA Jet Propulsion Laboratory NOVA Award in Recognition of Effective Leadership, 1997

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
Associate Dean, Henry Samueli School of Engineering, January 1, 2011-Present
Department Chairperson, Biomedical Engineering Department, July 1, 2009-June 30, 2010
Associate Dean, Henry Samueli School of Engineering, March 1, 2008-June 30, 2010
Department Chairperson, Biomedical Engineering Department, July 1, 2005-June 30, 2006
Associate Chair, Biomedical Engineering Department, July 1, 2003-June 30, 2005
Member, Recruitment for Director of Edwards Lifesciences Center, July 1, 2007-June 30, 2009
Lead Faculty for BME Department, ABET Accreditation, July 1, 2006-June 30, 2009
Member, Subcommittee on International Education, July 1, 2010-Present
Member, Responsible Conduct of Research (RCR) Task Force, May 1, 2009-December 31, 2010
Member, Research Advisory Committee, July 1, 2008-June 30, 2009
SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA

Founding Chair, IEEE Engineering in Medicine and Biology Society, Orange County Chapter,
August 18, 2006 – December 31, 2012

Member, Editorial Board, Journal of Micromechanics and Microengineering, 1994 – present

Guest Editor, IEEE Sensors Journal, Special Issue on Microsensors and Microactuators:
Technology and Applications, Vol. 4, 2004

Associate Editor, IEEE Sensors Journal, 2006 – present

Guest Editor, Journal of Biomedical Microdevices, Special Issue on Microimplants, 2006

SELECTED PUBLICATIONS AND PRESENTATIONS from the past five years

Conference/Workshop/Symposium Proceedings

Y.-H. Hsu and W. C. Tang, “Microfabricated piezoelectric transducer platform for mechanical

cellular diagnostics,” Proc. 13th Int. Conf. Miniaturized Syst. Chem. Life Sci. (μTAS), Jeju,

H. C. Wong and W. C. Tang, “Effects of friction coefficient and receptor number on cell-substrate
interactions during migration,” Proc. ASME 2010 Summer Bioeng. Conf. (SBC 2010), Naples,
FL, June 16 – 19, 2010, CD-ROM.

L. Esfandiari and W. C. Tang, “PDMS stretchable platform for the studies of mechanical compression
Kong & Macau, China, December 5 – 9, 2010, CD-ROM.

H. C. Wong and W. C. Tang, “Finite element analysis of the effects of focal adhesion mechanical
properties and substrate stiffness on cell migration,” J. Biomechanics, Vol. 44, pp. 1046 – 1050,
2011.

Y.-H. Hsu, P. Lu, J. L. Coleman, and W. C. Tang, “A microfluidic platform to isolate avian
erthrocytes infected with Plasmodium gallinaceum malaria parasites based on surface

Y.-H. Hsu and W. C. Tang, “Microbioreactor designed for integration with piezoelectric transducers

H. C. Wong and W. C. Tang, “Computational study of local and global ECM degradation and the

IEEE Int. Conf. Nano/Micro Engineered and Molecular Systems, Kaohsiung, Taiwan, February

Y.-H. Hsu, J. L. Coleman, and W. C. Tang, “Surface morphological changes as biomarkers for
detecting malaria infected avian erythrocytes,” Ext. Abs., 6th Int. Conf. Microtechnologies in

Y.-H. Hsu, J. L. Coleman, and W. C. Tang, “Microfluidic platform for detecting malaria infected
avian red blood cells,” Ext. Abs., 12th UC Systemwide Bioengineering Symposium, Santa

PROFESSIONAL DEVELOPMENT ACTIVITIES – none
NAME – Bruce J. Tromberg

EDUCATION
Postdoctoral Scholar, Photomedicine, Beckman Laser Institute, 1989
PhD, Chemistry, University of Tennessee, Knoxville, 1988
BA, Chemistry, Vanderbilt University, 1979

ACADEMIC EXPERIENCE
1990-1995  Assistant Professor, Department of Surgery, Beckman Laser Institute, UC Irvine
1995-2002  Associate Professor, Department of Surgery, UC Irvine.
1997-present  Director, Laser Microbeam and Medical Program, (LAMMP), NIH-National Biomedical Technology Resource Center, Beckman Laser Institute, UC Irvine
2002–2005  Vice Chair, Department of Biomedical Engineering, UC Irvine.
2002-present  Professor, Department of Biomedical Engineering and Surgery, UC Irvine
2003-present  Director, Beckman Laser Institute and Medical Clinic, UC Irvine
2004-present  Co-Leader, Onco-Imaging & Biotech Program, NCI Comprehensive Cancer Center
2010-present  Co-Leader, Translational Tech Core, NCATS Center for Translational Science

NON-ACADEMIC EXPERIENCE

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS: N/A

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS
Optical Society of America (OSA); The International Society for Optical Engineering (SPIE); Biomedical Optics Society (BiOS).

HONORS AND AWARDS
Whitaker Foundation Young Investigator Award (1992); National Institutes of Health FIRST Award (1994); Cornelius Hopper Innovation Award, California Breast Cancer Research Symposium (1999); Coherent-Biophotonics Young Investigator Award (2000); Avon Foundation Breast Cancer Research Scholar (2000); OE Magazine Technology Innovator Award (2002); Fellow, International Society for Optical Engineering, SPIE, (2006); Fellow, American Institute for Medical and Biological Engineers, AIMBE, (2006); SPIE Directors Award (2009)

SERVICE ACTIVITIES within UNIVERSITY OF CALIFORNIA
UCI School of Medicine Deans Advisory Council 2003-present; NSF Center for Biophotonics Science and Technology, UC Davis, Scientific Advisory Board (2004-2013); Vice-chair, UCI School of Medicine Vision 2010 Committee (2004-2005); UCI School of Engineering Deans Advisory Council (2008-present); Chair, UCI School of Engineering Dean Search Committee (2007 and 2010); UCI School of Engineering Strategic Planning Steering Committee (2009-2010)
SERVICE ACTIVITIES outside UNIVERSITY OF CALIFORNIA

Editor in Chief, Journal of Biomedical Optics (1999-2009); SPIE BiOS Conference Co-Chair, Optical Tomography & Spectroscopy of Tissue (2001-present); Co-Chair, NIH Workshop on Optical Diagnostic Imaging from Bench to Bedside (2006, 2009, 2011); American College of Radiology Imaging Network, Experimental Imaging Sciences Committee (2007-present); NIH-NIBIB Advisory Council (2012-present); P41 center Advisory Boards: UCI, MIT, UPenn; Editorial Board Member: JBO, Measurement Science and Technology, Cancer Research.

5 SELECTED PUBLICATIONS from the past five years (>300 pubs, 15 patents)


I. Selected Presentations (>200): Plenary Lecture, Laser Applications in the Life Sciences (LALS), Oulu Finland (2010); Sackler Lecturer, Tel Aviv University (2011); Plenary Lecture, The Optical Society (OSA) Topical Meeting on Biomedical Optics (2012); Keynote Lecture, International Center for Scientific Debate (B-Debate), Barcelona, Spain (2012); Keynote Lecture, Institute of Physics, London, MS&T 90th Anniversary Symposium, (2013); Cameron Lecture, Univ of Wisconsin Medical Physics (2013)

PROFESSIONAL DEVELOPMENT ACTIVITIES

Developed Lectures for Courses in International Schools: Lund University Summer School in Biophotonics, Venn, Sweden; University of Limerick, Biophotonics Ireland; University of Sao Paulo-San Carlos Institute of Physics, Brazil; Harvard University Advanced Molecular Imaging and Clinical Translation Workshop (CME credit).
Appendix 6: Course Outlines
ENG 210P: CAPSTONE PROJECT

Catalog Data: ENG 210P CAPSTONE Project

(Credit Units: 4)

Students are required to complete a project that deals with a specific emphasis of their MEng concentration/specialization. May be taken multiple times for credit, up to 8 credits total.

Corequisite: -

Prerequisite: 

Textbooks: None

References: None

Coordinator: Fadi Kurdahi

Course Objectives: To design, build and test an engineered system.

Course Outcomes: 1. Identify a problem and formulate a strategy to solve it in a systematic fashion with given constraints of time, budget and other resources

2. Generate necessary project reports such as project proposal, project time-line, design reports, final reports, etc.

3. Work in teams

4. Consider the economic, environmental, social, political, ethical, health, safety, regulatory, security and privacy impact of their final product,
Prerequisites By Topic: None

Class Schedule: Each class meets for one lecture hour per week and 9 hours of laboratory for 10 weeks.

Computer Usage: C/C++, Matlab/Simulink and/or Labview and/or Modelica.

Grading Criteria: Final Project 100%

Prepared by: Fadi Kurdahi

Date Prepared: March 2018

Date Last Modified: March 5, 2018
ENG 281AP

ENTREPRENEURSHIP SCIENCE & ENGINEERING:

INNOVATION

FALL 2019

Class Website: TBD

Contact Information

Professor XXXXX YYYY
Email: TBD
Office Hours: TBD

Professor Bio

TBD

Classroom Etiquette, Guidelines, & Policies

Academic Honesty

The University is an institution of learning, research, and scholarship predicated on the existence of an environment of honesty and integrity. As members of the academic community, faculty, students, and administrative officials share responsibility for maintaining this environment. It is essential that all members of the academic community subscribe to the ideal of academic honesty and integrity and accept individual responsibility for their work. Academic dishonesty is unacceptable and will not be tolerated at the University of California, Irvine. Cheating, forgery, dishonest conduct, plagiarism, and collusion in dishonest activities erode the University's educational, research, and social roles.
If students who knowingly or intentionally conduct or help another student perform dishonest conduct, acts of cheating, or plagiarism will be subject to disciplinary action at the discretion of UC Irvine.

By enrolling in this course, you agree to be bound by the University of California, Irvine’s policy on academic honesty (http://www.senate.uci.edu/senateweb/default2.asp?active_page_id=754). This policy may also be found in your Graduate Student Handbook.

Attendance

Your attendance for each class session is expected, as is your active participation. If you miss a class for personal or business reasons, please inform the instructor in advance if at all possible. Absences without pressing reasons indicate disinterest in the course and will reflect on your grade. Initiate arrangements for submitting any make-up assignments.

Code of Conduct

All participants in the course are bound by the University Of California Code Of Conduct, found at http://www.ucop.edu/ucophome/coordrev/ucpolicies/aos/uc100.html.

Diversity & Inclusiveness Policy

The University of California, in accordance with applicable Federal and State law and University policy, does not discriminate on the basis of race, color, national origin, religion, sex, gender identity, pregnancy, physical or mental disability, medical condition (cancer related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services. The University also prohibits sexual harassment. This nondiscrimination policy covers admission, access, and treatment in University programs and activities.

Course Objectives

At the end of this course, students will be able to:

- Understand the importance of continual innovation
- Apply techniques for critical thinking
- Recognize the need for intrapreneurship
- Know a framework to transform an idea into an actual product or service
• Develop interpersonal skills to pitch a new idea

**Course Overview**

This course will teach concepts on how to develop innovate/disruptive ideas thru actual delivery and adoption. This course will focus on the critical thinking skills, the process of developing an idea into a product/service, and teaching a framework to understand how to foster adoption of the idea and product.

**Prerequisites – Classes or Knowledge Required Before Taking This Course**

Some experience with product development is helpful but not required.

**Course Materials**

• No textbooks are required for this course

**Grading**

**Evaluation of Student Performance Weighted as Percentages of the Total Grade**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Participation</td>
<td>10%</td>
</tr>
<tr>
<td>Midterm</td>
<td>25%</td>
</tr>
<tr>
<td>Class Project Assignment #1</td>
<td>10%</td>
</tr>
<tr>
<td>Class Project Assignment #2</td>
<td>10%</td>
</tr>
<tr>
<td>Class Project Assignment #3</td>
<td>10%</td>
</tr>
<tr>
<td>Class Project Assignment #4</td>
<td>10%</td>
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<tr>
<td>Class Project Final Presentation</td>
<td>25%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>
Class Project

Students will form teams to work on real-world projects. The teams will define the opportunity, apply the course concepts, and simulate taking an idea through implementation and adoption. The teams will present their work throughout each course in the sequence.
Course Schedule

Week 1 – The Need for Continual Innovation

- What is innovation
  - “Adapt or die”
  - The power of disruptive thinking
- View points of the world
  - Descriptive
  - Predictive
  - Prescriptive
- Types of thinking: Revolutionary versus Evolutionary
  - Out-of-the-box
  - Around-the-box
- Homework (Due Week 2)
  - Class Project Assignment #1: Scope definition and initial brainstorming

Week 2 – The Spirit of Entrepreneurship/Intrapreneurship

- Class Project reviews
- Intrapreneurship / Entrepreneurship
  - Fostering the culture of creativity
  - “Internal disruption” to the organization
- Cultivating stakeholder buy-in
  - Three types of stakeholders
  - Stakeholder identification
  - Influencing techniques
- Homework (Due Week 3)
  - None

Week 3 – Ideation

- Guest speaker
- Defining ideation
- How to generate ideas
  - Tools and techniques
- Idea evaluation
  - Assessing ideas
  - Validating the concept
- Homework (Due Week 4)
  - Class Project Assignment #2: Class project idea/concept

Week 4 – What is a “good” idea?
• Class Project reviews
• Worth doing
  o Business case analysis
  o Triple constraints
• Specter of irrationality
  o Emotional influences
  o Hidden bias
  o Neglecting the ripple effect of decisions
• **Homework (Due Week 5)**
  o Study for the midterm

**Week 5 – Understanding the Customer**

• **Midterm**
• Defining the market
  o TAM / SAM / ITM
• User scenarios
  o Product view
  o Consumption focus
• **Homework (Due Week 6)**
  o None

**Week 5 – Value Propositions**

• Guest speaker
• Value propositions
  o Fills a need
  o Pain points and opportunities
• Framing the value proposition
  o Quantifying
  o Creating the message
• **Homework (Due Week 3)**
  o Class Project Assignment #3: Value proposition definition

**Week 6 – Charting the Right Path**

• Class Project reviews
• Techniques to confirm understanding
  o Qualitative
    ▪ Observation
    ▪ Interviewing
    ▪ Workshops
  o Quantitative
    ▪ Sampling
    ▪ Questionnaires
    ▪ Models
Master of Engineering SSPGDP Proposal – Samuei School of Engineering – UC Irvine

- Document findings
  - Mind maps
  - Rich pictures/graphs
  - Context diagram

- **Homework (Due Week 8)**
  - Class Project Assignment #4: Customer Interviews

**Week 7 – The Art of Pivoting**

- Guest speaker
- Change is inevitable
  - Why is it necessary
  - When to change
  - When not to change
- Successfully managing change
  - Techniques
  - Processes
  - Maintaining stakeholder buy-in

- **Homework (Due Week 8)**
  - Class Project Assignment #4: Customer Interviews

**Week 8 – Product Strategy: Making the Idea Real**

- Class Project reviews
- Delivering on the idea
  - Making the roadmap
  - Making the decisions
    - Must-have versus nice-to-have
    - Big Bang or Agile?
- Triple constraint trade offs
  - Scope
  - Schedule
  - Cost

- **Homework (Due Week 10)**
  - Group Project Final Presentation

**Week 9 – Pitching the Idea**

- Guest Speaker
- Framing
  - Lay the foundation
  - Explain the market
  - Showcase the value
- The “ask”
  - Defining what you need
  - Defining what you will exchange for help
• **Homework (Due Week 10)**
  o Group Project Final Presentation

**Week 10 – Class Wrap Up**

- Class project presentations
- Summary and closing thoughts for the course
ENG 281BP

ENTREPRENEURSHIP SCIENCE & ENGINEERING:

BUILD

WINTER 2020

Class Website: TBD

Contact Information

Professor XXXXX YYYYY
Email: TBD
Office Hours: TBD

Professor Bio

TBD

Classroom Etiquette, Guidelines, & Policies

Academic Honesty

The University is an institution of learning, research, and scholarship predicated on the existence of an environment of honesty and integrity. As members of the academic community, faculty, students, and administrative officials share responsibility for maintaining this environment. It is essential that all members of the academic community subscribe to the ideal of academic honesty and integrity and accept individual responsibility for their work. Academic dishonesty is unacceptable and will not be tolerated at the University of California, Irvine. Cheating, forgery, dishonest conduct, plagiarism, and collusion in dishonest activities erode the University's educational, research, and social roles.
If students who knowingly or intentionally conduct or help another student perform dishonest conduct, acts of cheating, or plagiarism will be subject to disciplinary action at the discretion of UC Irvine.

By enrolling in this course, you agree to be bound by the University of California, Irvine’s policy on academic honesty (http://www.senate.uci.edu/senateweb/default2.asp?active_page_id=754). This policy may also be found in your Graduate Student Handbook.

**Attendance**

Your attendance for each class session is expected, as is your active participation. If you miss a class for personal or business reasons, please inform the instructor in advance if at all possible. Absences without pressing reasons indicate disinterest in the course and will reflect on your grade. Initiate arrangements for submitting any make-up assignments.

**Code of Conduct**

All participants in the course are bound by the University Of California Code Of Conduct, found at http://www.ucop.edu/ucophome/coordrev/ucpolicies/aos/uc100.html.

**Diversity & Inclusiveness Policy**

The University of California, in accordance with applicable Federal and State law and University policy, does not discriminate on the basis of race, color, national origin, religion, sex, gender identity, pregnancy, physical or mental disability, medical condition (cancer related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services. The University also prohibits sexual harassment. This nondiscrimination policy covers admission, access, and treatment in University programs and activities.

**Course Objectives**

At the end of this course, students will be able to:

- Understand what is an entrepreneurial ecosystem
- Learn how to use ecosystem resources to fill in gaps with their venture
- Apply business model frameworks
- Know how to create a financial pro forma
- Learn the different fundraising options available and which ones to use

**Course Overview**

Learn how to build an executable plan to transform an idea into a product. Learn how to construct a go to market plan, raise funds for building the product, and leverage ecosystem resources to fill in resource gaps.

**Prerequisites – Classes or Knowledge Required Before Taking This Course**

Some experience with product development is helpful but not required.

**Course Materials**

- No textbooks are required for this course

**Grading**

**Evaluation of Student Performance Weighted as Percentages of the Total Grade**

<table>
<thead>
<tr>
<th>Task</th>
<th>Weight</th>
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<tr>
<td>Class Participation</td>
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<tr>
<td>Class Project Assignment #1</td>
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<td>Class Project Assignment #2</td>
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<tr>
<td>Class Project Assignment #4</td>
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Class Project

Students will form teams to work on real-world projects. The teams will define the opportunity, apply the course concepts, and simulate taking an idea through implementation and adoption. The teams will present their work throughout each course in the sequence.
Course Schedule

Week 1 – Innovation Recap

- What is innovation
  - “Adapt or die”
  - The power of disruptive thinking
- Power of value propositions
  - Understanding the customer needs
  - Creating the message
- Revisiting our product strategy
- **Homework (Due Week 2)**
  - None

Week 2 – The Entrepreneurship Ecosystem

- Guest Speaker
- Define what is an ecosystem
  - What makes an entrepreneurship ecosystem special
  - Why is it useful in building a company
- Recognizing the different types of ecosystems
- Identifying which ecosystem is right for you
- **Homework (Due Week 3)**
  - Class Project Assignment #1: Establishing your ecosystem

Week 3 – Don’t Reinvent the Wheel

- Class Project reviews
- Procurement
  - Make or buy decisions
  - When to engage
- Partnering versus outsourcing
  - What’s the difference
  - Opportunities versus threats
- **Homework (Due Week 4)**
  - Class Project Assignment #3: Partnership plan

Week 4 – Establishing the Business Model

- Class Project reviews
- What is a business model
  - Structure/organization
  - Revenue model and price points
- Trade off analysis
Week 5 – Go to Market Strategy

- **Midterm**
  - What is a go to market strategy?
    - Why is it necessary
    - Initial target market
    - Leveraging user personas
  - Building a customer roadmap
    - Techniques
    - Processes
    - Maintaining stakeholder buy-in
- **Homework (Due Week 6)**
  - Class Project Assignment #2: Go to market plan

Week 6 – Risk: Friend or Foe?

- Class Project reviews
- The good, the bad, and the ugly about risk
  - Uncertainty is everywhere
  - “Turn lemons into lemonade”
- Risk management
  - Types of risks
  - Risk identification and assessment techniques
  - Risk responses
- **Homework (Due Week 7)**
  - Class Project Assignment #3: Managing Risk

Week 7 – Financial projections

- Class Project reviews
- Guest speaker
- Building a financial model
  - Revenue
  - Variable costs
  - Fixed costs
  - Cost of doing business
- Scenario planning
  - Optimistic case
  - Most likely
  - Pessimistic
• **Homework (Due Week 8)**
  o None

**Week 8 – Fund raising**

• Guest speaker
• Evaluate the funding opportunities
  o Different rounds
  o Debt versus equity
• Understand how to position yourself for funding
  o Allocating funds
  o Justifying salaries
  o Explaining financial projections
  o Premoney valuation
• **Homework (Due Week 9)**
  o Class Project Assignment #4: Fundraising plan

**Week 9 – Fund raising (continued)**

• Class Project reviews
• Guest speaker
• Types of investors
  o The 3 “Fs”
  o Angels
  o Venture Capitalists
  o Investor funds
• More than money
  o Clients
  o Advisors
  o Network expansion
• Dealing with feedback
• Maintaining control of your idea/venture
• **Homework (Due Week 9)**
  o Final class project presentations

**Week 10 – Class Wrap Up**

• Class project presentations
• Summary and closing thoughts for the course
ENG 281CP

ENTREPRENEURSHIP SCIENCE & ENGINEERING:

LAUNCH

SPRING 2020

Class Website: TBD

Contact Information

Professor XXXXX YYYY
Email: TBD
Office Hours: TBD

Professor Bio

TBD

Classroom Etiquette, Guidelines, & Policies

Academic Honesty

The University is an institution of learning, research, and scholarship predicated on the existence of an environment of honesty and integrity. As members of the academic community, faculty, students, and administrative officials share responsibility for maintaining this environment. It is essential that all members of the academic community subscribe to the ideal of academic honesty and integrity and accept individual responsibility for their work. Academic dishonesty is unacceptable and will not be tolerated at the University of California, Irvine. Cheating, forgery, dishonest conduct, plagiarism, and collusion in dishonest activities erode the University's educational, research, and social roles.
If students who knowingly or intentionally conduct or help another student perform dishonest conduct, acts of cheating, or plagiarism will be subject to disciplinary action at the discretion of UC Irvine.

By enrolling in this course, you agree to be bound by the University of California, Irvine’s policy on academic honesty (http://www.senate.uci.edu/senateweb/default2.asp?active_page_id=754). This policy may also be found in your Graduate Student Handbook.

**Attendance**

Your attendance for each class session is expected, as is your active participation. If you miss a class for personal or business reasons, please inform the instructor in advance if at all possible. Absences without pressing reasons indicate disinterest in the course and will reflect on your grade. Initiate arrangements for submitting any make-up assignments.

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**Course Objectives**

**At the end of this course, students will be able to:**

- Understand how to deliver an idea
- Apply project management techniques
- Recognize how to build a successful team
- Learn the components required to build a new product or service
• Handle constructive and destructive feedback
• Measure progress in launching a new venture

Course Overview

Understand how to build an actual product. Learn about prototyping and basic project management skills. Learn a framework on when to pivot for course corrections. Identify how to define outcome metrics and measure progress as the product is launched.

Prerequisites – Classes or Knowledge Required Before Taking This Course

Some experience with product development is helpful but not required.

Course Materials

• No textbooks are required for this course

Grading

Evaluation of Student Performance Weighted as Percentages of the Total Grade

<table>
<thead>
<tr>
<th>Component</th>
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<tr>
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<tr>
<td>Class Project Assignment #2</td>
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</table>
Class Project Assignment #3  5%
Class Project Assignment #4  10%
Class Project Assignment #5  10%
Class Project Final Presentation  25%
TOTAL  100%

Class Project

Students will form teams to work on real-world projects. The teams will define the opportunity, apply the course concepts, and simulate taking an idea through implementation and adoption. The teams will present their work throughout each course in the sequence.
Course Schedule

Week 1 – Basics of Project Management

- Class Project reviews
- Why do we need it
  - Importance of planning
  - Do it right the first time
- Project Management 101
  - 5 Phases
  - 10 Knowledge domains
- **Homework (Due Week 8)**
  - Class Project Assignment #1: Project Management Plan

Week 2 – Building the Team

- Class Project reviews
- Importance of the team
  - Management
  - Board of Directors
  - Board of Advisors
- Gap assessments
  - Skills
  - Domain knowledge and contacts
- Specter of irrationality
  - Emotional influences
  - Hidden bias
  - Neglecting the ripple effect of decisions
- **Homework (Due Week 3)**
  - None

Week 3 – Building the Product

- Guest speaker
- Assessing feasibility
  - Engineering analysis
- Feature prioritization
  - Must have
  - Nice to have
  - Identify gold plating
- Cultivating stakeholder buy-in
- Generating the product roadmap
- **Homework (Due Week 4)**
  - Class Project Assignment #2: Product Roadmap
Week 4 – Product Change Management

- Class Project reviews
- Requirements Validation
  - Tracing through design and build
  - System assessment
  - Gap identification
- Change requests
  - Documenting
  - Impact assessment
  - Decision making
- Change implementation
- **Homework**
  - Study for the midterm

Week 5 – Prototyping

- **Midterm**
- Power of being Agile
- Prototyping
  - Techniques
  - Processes
- Building the MVP
  - Prioritization
  - Future planning
- **Homework (Due Week 6)**
  - None

Week 6 – Handling adversity

- Guest speaker
- From Green to Red
  - Root cause analysis
  - Making the decisions
    - Trade offs
      - Scope
      - Schedule
      - Cost
    - It’s about the business
- Securing investor and stakeholder buy in
- **Homework (Due Week 7)**
  - Class Project Assignment #3: Root Cause Simulation

Week 7 – Build the Infrastructure

- Class Project reviews
• Focus on non-product functions
  o Marketing
  o Customer Support
  o Finance/Accounting
• Revisiting scenario planning
  o Forecast the cases
  o Risk plans for variable outcomes
  o Risk responses
• **Homework (Due Week 9)**
  o Class Project Assignment #4: Infrastructure Plan

**Week 8 – Execution Time**

• Guest speaker
• Work the plan
  o Calculating earned value
  o Driving performance
• Milestones
  o Showing progress
  o Triggering additional events
    • Funding
    • Revenue
    • Client acquisition
  o Managing risk
• **Homework (Due Week 9)**
  o Class Project Assignment #7: Managing Risk

**Week 9 – Measuring Progress**

• Class Project reviews
• Product adoption
  o Why is it necessary
  o How to drive
• Monitoring plan
  o KPIs and metrics
  o Course correction techniques
• Managing the future
  o Pivoting on the roadmap
  o Managing stakeholder expectations
  o Re-chartering the future
• **Homework (Due Week 10)**
  o Class Project Presentations

**Week 10 – Class Wrap Up**

• Class project presentations
• Summary and closing thoughts for the course
BME 210P MOLECULAR AND CELLULAR ENGINEERING

Credit Units: 4

Course Goals and Description:

This course covers the engineering of physiological function at the genetic, cellular, and tissues scales. Topics include cloning and genetic engineering, extracellular matrix biomaterials, principles of regenerative and tissue engineering, and experimental design. At the end of this course, students will be able to:

a. Demonstrate an in-depth knowledge of molecular biology and cell biology.

b. Design basic strategies for the genetic engineering of cellular function and for the engineering of functional tissue constructs.

c. Interpret and evaluate experimental data from primary literature and design well-controlled experimental molecular, cellular, and tissue scales.

Topical Outline for Lectures:

1. Biological strategies for information storage and transfer
2. DNA sequencing, cloning, and synthesis
3. Tissue organization, morphogenesis, and remodeling
4. Sources of cells (including stem cells) and regulation of cell fate
5. Biomaterial scaffolds as synthetic ECM analogs
6. Immune Response to cells and biomaterials
7. Controlled release strategies
8. Cellular biomechanics and mechanotransduction
9. Mass transport and the need for vascularization
10. Principles of experimental design

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.): Visits to relevant faculty labs may be scheduled during select classes to give students hands-on working knowledge of experimental methods.

Grading and Course Requirements: homework (20%), midterm exam (40%), final exam (40%)
Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.


Prerequisites:

Molecular Biology (BME50A or equivalent). Cell Biology (BME50B or equivalent).

Explanation of Potential Course Overlap: none

Concurrent Enrollment (graduate/undergraduate): none
BME 211P MICROSCALE TISSUE ENGINEERING

Credit Units: 4

Course Goals and Description:

This course covers the engineering of physiological function at the scale of individual cells. Topics include micropatterning, microfluidic tissue culture, engineering the cellular microenvironment, and microphysiological systems. By the end of the course, students will be able to:

a. Demonstrate an in-depth understanding of microtechnology tools relevant to cell culture and tissue engineering.
b. Design and interpret microscale cell biology experiments.
c. Design and communicate a research proposal utilizing the tools of microscale tissue engineering.

Topical Outline for Lectures:

11. Soft lithography; microcontact printing; microfluidics
12. Cell micropatterning techniques in 2D and 3D
13. Microfluidic tissue culture
14. Engineering of cellular substrates
15. Engineering of the matrix environment
16. Engineering of soluble factor gradients
17. Engineering of the mechanical environment
18. Engineering of cell-cell interactions
19. Optogenetics
20. Microphysiological systems

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.): Visits to relevant faculty labs may be scheduled during select classes to give students hands-on working knowledge of experimental methods.

Grading and Course Requirements: Research proposal (40%), midterm exam (30%), final exam (30%)

Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.

Prerequisites:

Molecular and Cellular Engineering (BME 210).

Explanation of Potential Course Overlap: none

Concurrent Enrollment (graduate/undergraduate): none
BME 220P SENSORY MOTOR SYSTEMS

Credit Units: 4

Course Goals and Description:

This course covers the quantitative and systems approach to understanding physiological systems. Systems covered include the nervous and musculoskeletal systems. At the end of this course, students will:

a. Develop an understanding of the fundamental components of the nervous and musculoskeletal systems
b. Learn to solve integrative problems focused on sensation and the regulation of movement in humans
c. Use mathematical techniques to characterize and understand biological system performance
d. Work together in multi-disciplinary teams to solve open-ended problems in nervous and musculoskeletal systems

Topical Outline for Lectures:

1. Muscle (mechanics and modeling)
2. Bone (material properties and skeletal forces)
3. Neurons (as cables and computers)
4. Sensory Systems (emphasis on auditory system)
5. Biomechanical modeling of movement control and surgery
6. Functional electrical stimulation systems
7. Orthopaedic implants
8. Rehabilitation robotics
9. Biomimetic devices (e.g. robotic insects)
10. Neuroprostheses (e.g. cochlear implants)
11. Brain computer interfaces

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.): Course includes one computer laboratory on the modeling of neural circuits. Student teams may also visit relevant faculty labs during select classes to give them hands-on working knowledge of how quantitative approaches are actually being applied to neuroscience, etc.

Grading and Course Requirements:

- Homework (4 sets): 10%
- Problem-based learning (PBL) reports (3): 30%
Master of Engineering SSPGDP Proposal – Samueli School of Engineering – UC Irvine

- Midterm: 30%
- Final: 30%
- Total: 100%

Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.

No required textbook, but supplemental readings will also be placed at the Engineering Copy Center:
  a. Web page: https://eee.uci.edu/08f/14030
  b. Course Web Page from 2007: https://eee.uci.edu/07f/14030
  c. Course Web Page from 2006: http://eee.uci.edu/06f/14170 (contains solutions to previous problem sets, PBL's, and exams)

Prerequisites:
Elementary Differential Equations (Mathematics 3D)

Explanation of Potential Course Overlap: none

Concurrent Enrollment (graduate/undergraduate): none
BME 234P NEUROIMAGING DATA ANALYSIS

Credit Units: 4

Course Goals and Description:

This course provides knowledge and understanding of recent techniques for the analysis of healthy and pathological structure and function in neuroimaging data. At the end of this course, students will:

a. Be able to identify data analysis problems typical in neuroimaging
b. Be able to develop strategies for data analysis
c. Be able to describe the use and limitations fo specific modeling approaches
d. Be able to interpret results of neuroimaging techniques
e. Be able to demonstrate use of tools for data analysis
f. Be able to demonstrate knowledge of the design, implementation, testing and usage of computer algorithms to analyze neuroimages.

Topical Outline for Lectures:

1. Review of neuroimaging methods: aMRI, fMRI, EEG, MEG, optical imaging
2. Layout of a basic data analysis strategy
3. Review of current concepts in statistical data analysis
4. Morphometry: describing the human brain, brain atlases
5. Strategies for ERP/ERF analysis, source localization
6. Strategies for fMRI analysis, model-based and exploratory approaches
7. Description and analysis of functional networks

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.): Students have the option of implementing and testing algorithms in the SIP lab. Student teams may also visit relevant faculty labs and engineering/clinical facilities during select classes to give them hands-on working knowledge of imaging and data analysis techniques presented in this course.

Grading and Course Requirements:

- Research project: 70%
- Discussion: 30%
- Total: 100%

Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.
A list of journal publications will be provided by the instructor.

Prerequisites:

Previous knowledge in basic math, statistics and neuroanatomy.

Explanation of Potential Course Overlap: none

Concurrent Enrollment (graduate/undergraduate): none
BME 238P SPECTROSCOPY AND IMAGING OF BIOLOGICAL SYSTEMS

Credit Units: 4

Course Goals and Description:

This course covers the principles of spectroscopy; Absorption; Molecular orbitals; Multiphoton transitions; Jablonski diagram; Fluorescence Anisotropy; Fluorescence decay; Quenching; FRET; Excited state reactions; Solvent relaxations; Instruments; Microscopy: Wide field, LSM, TPE; Fluorescent probes, Fluctuations Spectroscopy; optical resolution and super-resolution; CARS and SHG microscopy.

The design skills are developed and tested through a number of homework problems such as:

- Determine the relationship between energy level transitions and spectrum.
- Determine the effect of molecular rotations on the average polarization of an ensemble of molecules.
- Use intensity and temporal fluctuations to determine the number of molecules in a volume of excitation.
- Understand the principle of microscopy design for optical sectioning.
- Design experiments to measure molecular aggregation in biological systems.
- Identify molecular species in biological tissue on the basis of fluorescence lifetime.
- Understand the principles of optical super-resolution.
- Understand the principles on non-linear optics.

At the end of this course, students will:

a. Understand the nature of Spectroscopy and microscopy biological signals
b. Apply the essential analytical and numerical approaches for analyzing spectral and microscopy images
c. Fluctuations in optical signals related to images
d. Develop analysis skills by using correlation functions for signals analysis

Topical Outline for Lectures:

2. Week 2: Multiphoton transitions; Fluorescence Jablonski diagram; Excitation-emission
3. Week 3: Fluorescence Anisotropy; Fluorescence decay; Anisotropy decay
4. Week 4: Fluorescence decay analysis; Quenching; FRET; Excited state reactions. Solvent relaxations
5. Week 4: Instruments: Steady state. Sources, optical setup, detectors; lifetime instruments; Microscopy: Wide field, LSM, TPE; Fluorescent probes, Quantum dots
6. Week 5: Fluctuations. Diffusion; Fluctuations. Chemical reactions; Fluctuations. Chemical reactions
7. Week 6: PCH. Single point; Dynamic imaging
8. Week 7: ICS principles; RISC; N&B
9. Week 8: FLIM; FRET imaging microscopy
10. Week 9: TIRF microscopy; Optical resolution and super-resolution
11. Week 10: Non-linear spectroscopy: CARS and SHG microscopy

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.): Student teams may visit relevant faculty labs and/or spectroscopy facilities on campus during select classes to give them hands-on working knowledge of spectroscopy and imaging techniques covered in this class.

Grading and Course Requirements:

- Homework 1: 20%
- Homework 2: 20%
- Homework 3: 20%
- Final Exam: e.g. Research paper: 40%
- Total: 100%

Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.

No required textbook, but supplemental readings will also be placed at the Engineering Copy Center:

d. Web page: https://eee.uci.edu/08f/14030
e. Course Web Page from 2007: https://eee.uci.edu/07f/14030
f. Course Web Page from 2006: http://eee.uci.edu/06f/14170 (contains solutions to previous problem sets, PBL's, and exams)

Prerequisites:


Explanation of Potential Course Overlap: none

Concurrent Enrollment (graduate/undergraduate): none
BME 251P ENGINEERING MEDICAL OPTICS

Credit Units: 4

Course Goals and Description:

This course covers the principles of optics and photonics, integration of optical components into systems and devices, and analysis of physiologic signals obtained from biophotonics measurements. By the end of the course, students will be able to:

a. Demonstrate knowledge of the fundamentals of optics and how basic principles are used to design and optimize optical instruments used in medical diagnostics
b. Describe geometrical optics and its role in the design of microscopy instruments
c. Describe wave optics and its role in the design of instrumentation for optical coherence tomography
d. Describe basics of light matter interactions and its role in spectroscopy instruments
e. Explain principles of diffuse optics and its role in the development of photon migration and photothermal techniques for subsurface tissue imaging

Topical Outline for Lectures:

1. Introduction and overview of biomedical optics
2. Principles of geometrical optics, lenses, apertures, ray diagrams
3. Principles of geometrical optics, fibers and waveguides
4. Integration of geometrical optics into Microscopy systems
5. Applications of microscopy systems and laser scanning microscopies
6. Laser scanning microscopy; Principles of waves, interference, coherence
7. Principles of polarization and Doppler
8. Integration of wave concepts into the design of optical coherence tomography (OCT) systems
9. Applications of OCT in biology and medicine
10. Basic light matter interactions: absorption, emission, scattering
11. Photonic devices- sources: lasers, LEDs, SLDs
12. Photonic devices- detectors: performance theory; photomultipliers, photodiodes, array detectors;
13. System integration: Spectroscopy
14. Applications of spectroscopy in biology and medicine
15. Physiological Optics: eye structure, performance
16. Physiological Optics: vision mechanisms, image formation and perception
17. Image processing: modulation transfer function, transformation methods
18. Imaging: applications of image analysis and processing in biology and medicine

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.):
Lab projects will complement lecture topics in microscopy, interferometry, spectroscopy, and diffuse optics.
Computer usage includes simulation, modeling, and virtual instruments. Additional visits to relevant faculty labs may be scheduled during select classes to give students hands-on working knowledge of experimental methods.

Grading and Course Requirements:

- Homework: 0%
- Midterm: 25%
- Group project: 25%
- Lab: 25%
- Final: 25%
- Total: 100%

Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.

Lectures and problem sets are available and downloadable from the course website. Handouts from the instructor.

Prerequisites:

Previous knowledge in electromagnetic fields and solutions of problems in engineering applications. Maxwell’s equations and plane wave propagation.

Explanation of Potential Course Overlap: none

Concurrent Enrollment (graduate/undergraduate): none
BME 260P MICROFLUIDICS AND LABS-ON-A_CHIP

Credit Units: 4

Course Goals and Description:

This course provides an introduction to microfluidics and state-of-the-art micro Total Analysis Systems (uTAS). Lab-on-a-Chip biomolecular assays with device design principles for microscale sample preparation, flow transport, biomolecular manipulation, separation & detection, and the technologies for integrating these devices into microsystems. At the end of this course, students will be able to:

a. Understand the fundamentals of microfluidics technology and apply it towards the manipulation and analysis of biological cells and biomolecules on biochips.
b. Be able to design a microfluidic LOC system to solve a real-world diagnostics problem.
c. Be able to compare and critique existing microfluidic systems for various biomolecular assays and develop the knowledge base in state-of-the-art microfluidic LOC devices.
d. Be able to describe the steps in constructing a microsystem (design, fabrication) for biological sample analysis and disease management.

Topical Outline for Lectures:

1. Introduction: scaling of fluids at the microscale and its implications on devices
2. Review of microfabrication background
3. Physics and modeling of microfluidic systems
4. Microfluidic transport
5. Microfluidic sample preparation
6. Microfluidic sample detection
7. Two-phase microfluidics and its applications

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.): Specific discussions will take place on microfluidic system and device designs. Students will use learned skills to design systems and devices for lab-on-chip systems. Students will use word processors and drawing programs to do homework assignments. Additional visits to relevant faculty labs may be scheduled during select classes to give students hands-on working knowledge of experimental methods.

Grading and Course Requirements: homework (30%), midterm exam (30%), final exam (40%)
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Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.

Class notes handed out by instructor.

Prerequisites:

Familiarity with micro-device design tools, fabrication, packaging, surface treatment and testing techniques; common fabrication materials, biocompatibility, and familiarity with biomolecules and cells.

Explanation of Potential Course Overlap: none

Concurrent Enrollment (graduate/undergraduate): none
BME 262P MICROIMPLANTS

Credit Units: 4

Course Goals and Description:

This course covers the essential concepts of biomedical implants at the micro scale. Design, fabrication, and applications of several micro-implantable devices including cochlear, retinal, neural, and muscular implants. At the end of this course, students will:

a. Understand the essentials of applying MEMS technology for implantable devices
b. Understand the state-of-research in cochlear, retinal, neural, and muscle implants
c. Develop the knowledge base and skills in conducting research in MEMS-based implants
d. Present research findings both orally and in written reports

Topical Outline for Lectures:

1. Introduction: the purpose and limitation of implants
2. Review MEMS background
3. Physiology of hearing
4. Cochlear implants
5. Physiology of vision
6. Retinal implants
7. Physiology of the nervous system
8. Neural implants
9. Physiology of the musculoskeletal system
10. Muscle implants
11. Future implantable devices

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.): Students will use word processors and drawing programs to do homework assignments. Students may also visit relevant faculty labs during select classes to give them hands-on working knowledge of the process of developing implantable devices.

Grading and Course Requirements:

- Homework: 20%
Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.

No required textbook, class notes and other reading materials will be provided by the instructor.

Prerequisites:
Knowledge of MEMS design tools, fabrication, packaging, and testing techniques; common implant materials, biocompatibility, and foreign body responses.

Explanation of Potential Course Overlap: none

Concurrent Enrollment (graduate/undergraduate): none
BME 295P BIO-SPECTROSCOPY

Credit Units: 4

Course Goals and Description:

This course will begin with basic principles of fluorescence. Students will learn how using a light source such as a lamp, illuminator or laser can be used to excite fluorescent probes that can be detected with sensitive detectors (photon multiplier tubes and cameras). The information obtain from this procedure can be used to characterize probes, identify molecular species, tag proteins of interest and follow their interactions in living cells.

Students who complete the course should emerge as competent in spectroscopy methods and seminar participants. By the end of the course, you should be able to:

a. Demonstrate that you can critically assess a biological problem and will solve the questions with a technologies learned in class
b. Demonstrate that you have prepared lively seminar presentation and discussion by reading the literature for the group problem based learning assignments (PBL) and provide thoughtful criticisms of the presentations made by each group.
c. Produce a professionally-finished research proposal with an original insight.

Topical Outline for Lectures:

12. Introduction to fluorescence
13. Molecular orbital theory
14. Introduction to UV-Vis Spectroscopy & application to biomedical research
15. Transmission light microscopy, DIC, and phase contrast imaging
16. Phase contrast fluorescence, microscopy, and laser scanning microscopes
17. Confocal fluorescence microscopy
18. Conventional microscopy technique in biomedical research (FRAP, FLIP, etc).
19. Fluorescence-lifetime imaging microscopy (FLIM)
20. Principles of Forster Resonance Energy Transfer (FRET) and applications to biosensors
21. Principles and applications of fluctuation spectroscopy and cross-correlation spectroscopy.
22. Spatial-temporal image correlation techniques

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.):
Guest speakers may be scheduled to give students a working, in-depth knowledge of the topics listed above. Several classes will also take place in faculty laboratories in the Biomedical Engineering Department to give students hands-on experience.

Grading and Course Requirements:

- In-class problem sets & questionnaires: 30%
- Problem-based learning (PBL) assignments: 40%
- Final: 30%
- Total: 100%

In addition to regular problem sets, based on class discussions and to be completed in class, students will form groups to complete problem-based learning (PBL) assignments. PBL assignments will involve creative and practical thinking as well as teamwork.

Class attendance is required, and the students are responsible for all the material covered in the class. There will be a questionnaire for assessing the topic of discussion given before a lecture (choice of the instructor) that will be due at the end of class. For PBL assignments there will be no make-up assignments. PBL groups will be informed during the first week of class what days each group will present.

Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.


Prerequisites:

Basic physics, chemistry, and biology are strongly recommended.

Explanation of Potential Course Overlap: none
Concurrent Enrollment (graduate/undergraduate): none
BME 295P CARDIOVASCULAR DEVICES

Credit Units: 4

Course Goals and Description:

Cardiovascular devices are used to diagnose and treat heart disease and related health problems. In the United States, heart diseases and strokes are the first and fifth most prevalent causes of death, respectively. Major drivers for the US cardiovascular device segment are an aging population, unhealthy lifestyle trends, and increasing demand for minimally invasive surgeries. Cardiac rhythm management devices, interventional cardiac devices, and cardiac prosthetic devices are the major categories of cardiovascular devices.

The course covers a wide variety of cardiovascular implants, the science around those, regulatory affairs, and the cardiovascular device market. At the end of this course:

a. Students will learn about the fundamental and applied sciences behind cardiovascular devices.

b. Students will learn about FDA and regulatory affairs related to cardiovascular devices.

c. Students will be introduced to clinically relevant information on cardiovascular devices and implants.

d. Students will learn to extend their knowledge of engineering to understand cardiovascular devices, the market segments, and regulations.

Topical Outline for Lectures:

23. Introduction to cardiovascular devices
24. Testing and safety assurance
25. Artificial heart and assist devices
26. Principles of cardiovascular device design
27. Biomechanics of heart valves
28. Tissue engineered heart valves
29. Transcatheter heart valves
30. Coronary stents
31. Principles of pacemakers
32. Immune response to cardiovascular devices
33. Cardiovascular device market
34. Regulatory pathways for cardiovascular devices
35. Review of relevant device patents
36. Fundraising for start-ups in this business space

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.):
Guest speakers and visits to relevant faculty labs may be scheduled to give students a better working knowledge of the topics listed above.

Grading and Course Requirements:

- Homework (7 sets): 20%
- Midterm: 40%
- Final: 40%
- Total: 100%

There will be seven homework assignments throughout the quarter. Late homework is not accepted without prior approval from the instructor. All homework will be graded. No make-up exams are given. None of the homework grades is dropped. Class attendance is required, and the students are responsible for all the material covered in the class.

Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.

There will be no textbook for the class. Lecture materials and class notes will be provided by the instructor.

Prerequisites:

None, but knowledge of basic chemistry and biology are strongly recommended.

Explanation of Potential Course Overlap: none

Concurrent Enrollment (graduate/undergraduate): none
BME 295P CODING IN THE BRAIN

Credit Units: 4

Course Goals and Description:

The peripheral and sensory nervous systems use rate coding, computers use binary codes, but the brain, involved in learning and memory, uses distributed precise timing with millisecond precision. In comparison to existing digital computers, we will attempt to answer the question of why our brains are superior at associating a face with identity, context and emotion. Topics will range from the current literature on brain function integrated with alternate tracks of MATLAB programming to create neural networks and detect learning and/or techniques for effective grant proposal writing.

By the end of this course student will:

a. Be able to describe features of human cognition that make us unique in contrast to rats, monkeys, and digital computers.

b. Know how brain anatomy influences function and human uniqueness.

c. Learn computational methods for recognizing learning and memory

Topical Outline for Lectures:

37. Introduction to sensory inputs and brain processing
38. Levels of analysis, assessment, intervention, and need
39. Fundamentals concepts of neural signaling
40. Dendritic computation before and action potential
41. Spike timing dependent plasticity (STDP)
42. Principles of neural coding
43. Rhythms in the brain
44. Learning and memory
45. Techniques for effective grant writing and idea pitching

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.):

Visits to relevant faculty labs may be scheduled to give students a better working knowledge of the topics listed above. Students will be given opportunities to work in groups to review and present topics from current literature as well as new ideas generated by the group.
Grading and Course Requirements:

- Homework and class participation: 10%
- Presentation of review papers: 20%
- Midterm Exam: 25%
- Final Exam/final integrated project: 45%
- Total: 100%

Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.

Lectures will be supplemented with assignments for further reading. These are required readings. Assigned readings should be read in preparation for the class following the one in which they are assigned.

Introductory texts recommended as background reading in basic neuroscience and neural computation:

   [http://sites.sinauer.com/neuroscience5e/](http://sites.sinauer.com/neuroscience5e/)

Prerequisites:

Knowledge of basic chemistry, biology, and MATLAB programming are strongly recommended.

Explanation of Potential Course Overlap: none

Concurrent Enrollment (graduate/undergraduate): none
BME 295P NANOTECHNOLOGY FOR BIOMEDICINE

Credit Units: 4

Course Goals and Description:

Nanoparticles are materials that range in size from ~5 - 200 nm. They can be produced by synthetic means such as the formation of inorganic nanocrystals or by leveraging high surface energies. Nanoparticles exhibit numerous advantageous properties for detecting or delivering drugs to cells both inside and outside of the body. Often times the specific property of interest originates directly from the specific size scale of that nanoparticle. In this course, we discuss several different types of nanoparticles and their application to diagnosing and treating major human pathologies such as cancer, cardiovascular disease, and neurodegenerative diseases.

The course will be divided into 7 units that will cover topics ranging from descriptions of specific inorganic nanocrystals and nanocarriers to molecular targeting of cells and organs. Lectures within each unit will focus on: (1) basic properties and concepts, (2) protocols to synthesize and/or deploy the nanoparticles, and (3) advanced topics presented in the form of paper reviews. The paper reviews will be led by students, and will serve as one of the grading components (see below)

Topical Outline (units) for Lectures:

2. Inorganic nanocrystals: Superparamagnetic
3. Inorganic nanocrystals: Plasmonic
4. Inorganic nanocrystals: Optical
5. Molecular Targeting and Multivalent Adhesion
6. Interfacing with cells and the body
7. Advanced topics and applications

Topical Outline for Other Course Components (Laboratories, Field Trips, Discussions, etc.):

Visits to relevant faculty labs may be scheduled to give students a better working knowledge of the topics listed above.

Grading and Course Requirements:
Grades will be based on performance on two assignments: (1) a presentation given to the class in which a recent journal article is reviewed and (2) written research proposal outlining a new project idea. Each will constitute 50% of the final grade. Assignment descriptions will be posted on the course website. There will be one or two presentations for each unit listed above. All students will submit their 1st, 2nd, and 3rd choices to the instructor by email, and he/she will match each student to their preferred unit.

Reading List and/or Texts: List the text(s) and/or some of the key readings that will be required. A full bibliography is not necessary.

There will be no textbook for the class. Lecture material will be extracted from journal articles, the most important of which will be uploaded to the course website. Though not required, becoming familiar with this material prior to the lecture will help students understand the material and advance our discussions.

Prerequisites:

None, but knowledge of basic chemistry and cell biology are strongly recommended.

Explanation of Potential Course Overlap: none

Concurrent Enrollment (graduate/undergraduate): none
CEE249P Earthquake Engineering

Lecturer: Professor Farzad Naeim fnaeim@uci.edu

Lecture Topics:

1. Causes of Earthquakes
2. Earthquakes Damage Mechanisms
3. Quantification of Earthquakes
4. Earthquake Waves
5. Seismograms, Transducers, and Earthquake Records
6. Time-Domain Characteristics of Earthquake Ground Motions
7. Frequency-Domain Characteristics of Earthquake Ground Motions
8. Deterministic Seismic Hazard Analysis
9. Probabilistic Seismic Hazard Analysis
10. Response of Single Degree of Freedom Systems to Earthquake Excitations
11. Response of Multi Degree of Freedom Systems to Earthquake Excitations

Motivation: Understanding the causes and effects of earthquake ground motions is a fundamental requirement for structural engineering practice in seismic regions.

Course Outcomes: Students will be able to understand the nature of earthquake ground motions, principles and application of seismic hazard analysis techniques, response of structures to earthquake ground motions and how such knowledge is represented in widely used building codes.

Reading:

1. Geotechnical Earthquake Engineering by Steven L. Kramer, Prentice Hall, 2018. We will cover chapters 1 to 5 of this book and assign homework from it.
2. Basic Structural Dynamics by James C. Anderson and Farzad Naeim, John Wiley & Sons, 2012. Students need a book on structural dynamics that covers multi-degree of freedom systems and response to earthquake excitations. If you have another book that covers this material, you do not need to buy this book. Textbooks by Anil Chopra, Mario Paz, or Clough and Penzin also cover the necessary material.

Additional readings consist of presentation-style handouts prepared on each topic, each of which will be distributed a day or two before the lecture at which the material is covered.

Prerequisite: N/A

Grading Criteria:

Project 30%
Mid-Term Exam 30%
Final Exam 30%
Participation (homework, attendance, etc.) 10%
CEE290P Structural Engineering for Wind and Hurricane Forces

Lecturer: TBD

Lecture Topics:

1. Introduction to the state-of-the-art in the structural wind engineering field;
2. Wind Climates
3. Design Wind Speed Estimation
4. Bluff Body Aerodynamics and Applications
5. Wind-induced Building Responses
6. Wind, Gust Factor Approach
7. Wind Loads on Components and Cladding
8. Debris Impacts
9. Wind Loading Codes and Standards
10. Computational Tools and Computational Fluid Dynamics Techniques
11. Habitability to Building Vibrations

Motivation: Understanding the nature of wind and hurricane forces and how to design to resist the destructive forces and deformations imposed by wind is a fundamental requirement for structural engineering practice in practically every region of the world.

Course Outcomes: Students will be able to understand the nature of wind and hurricane induced forces and deformations on structures and how to design structures to resist these actions. They will learn the principles behind the provisions of codes and standards and learn how to apply them correctly and effectively.

Reading:

Readings consist of presentation-style handouts prepared on each topic, each of which will be distributed a day or two before the lecture at which the material is covered.

Prerequisite: N/A

Grading Criteria:

Project 30%

Mid-Term Exam 30%

Final Exam 30%

Participation (homework, attendance, etc.) 10%
CEE291P Performance-Based Structural Engineering (PBSE)

Lecturer: Professors Farzin Zareian zareian@uci.edu and Farzad Naeim fnaeim@uci.edu

Lecture Topics:

1. Introduction to PBSE
2. Uniform Hazard Spectrum (UHS), Conditional Mean Spectrum (CMS), and Code Target Spectrum
3. Earthquake Ground Motion Selection and Modification
4. Wind and Hurricane Excitations Selection and Adjustment
5. Component-based Assessment of Structures
6. ASCE-41, ASCE-7, PEER-TBI and LATBSDC Provisions and Application Examples
7. Overview of Structural Design Principles for Various Structural Systems
8. Preliminary Analysis and Design for PBSE
9. Linear and Nonlinear Structural Modeling for PBSE including Analysis Options and Examples
10. Performance-Based Assessment of Buildings, PEER Methodology, FEMA P-58 Methodology, including Application Examples
11. Work on Class Project Utilizing Tools Such as Opensees, ETABS, SAP2000 and PERFORM-3D.

Motivation: Performance based design is the modern approach to design structures for resiliency. In this approach, instead of reliance on simplistic prescriptive formulas, response of structures to the whole host of forces and deformations that they may be exposed to during their lifetime are studied and implications of various levels of failures are studied and distinguished. Understanding PBSE is essential for structural engineers who would like to assume a leading role in this profession.

Course Outcomes: Students will be able to understand and apply PBSE principles and formulations to evaluate and design structural systems of various type and for different functions.

Reading:

Readings consist of presentation-style handouts prepared on each topic, each of which will be distributed a day or two before the lecture at which the material is covered.

Prerequisite: CEE249P and CEE290P

Grading Criteria:

Project 30%
Mid-Term Exam 30%
Final Exam 30%
Participation (homework, attendance, etc.) 10%
CEE292P Ductile Design of Steel Structures

Lecturer: TBD

Lecture Topics:

1. Material Properties and Behavior of Structural Steel
2. Principles of Capacity Design
3. AISC Seismic Design Provisions
4. Principles of Connection Design
5. Behavior and Design of Steel Moment Resisting Frames
6. Behavior and Design of Steel Concentric and Eccentric Braced Frames
7. Behavior and Design of Bucking Restrained Braced Frames
8. Behavior and Design of Steel Plate Shear Wall Systems
9. Analysis and Design of Floor Diaphragms
10. Example Projects and Applications.

Motivation: Familiarity with properties and behavior of structural steel and ductile design of various steel components and systems is essential for a successful professional carrier in high-end structural engineering environments.

Course Outcomes: Students will be able to understand the behavior of various steel structural systems and components and apply this understanding towards design of real life steel structural systems and components.

Reading:

Readings consist of presentation-style handouts prepared on each topic, each of which will be distributed a day or two before the lecture at which the material is covered.

Prerequisite: N/A

Grading Criteria:

Project 30%

Mid-Term Exam 30%

Final Exam 30%

Participation (homework, attendance, etc.) 10%


**CEE293P Ductile Design of Concrete Structures**

**Lecturer:** TBD

**Lecture Topics:**

1. Material Properties of Concrete and Steel Reinforcement
2. Properties of Confined and Unconfined Concrete
3. ACI 318 Design Provisions
4. Analysis and Design of Members Subjected to Axial Load and Flexure
5. Analysis and Design for Shear in Beams, Columns and Walls;
6. Analysis and Design for Torsion
7. Development and Anchorage
8. Beam-Column Connections
9. Slab-Column and Slab-Wall Connections
10. Analysis and Design of Concrete Moment Resisting Frames
11. Analysis and Design of Concrete Shear Walls and Coupling Beams
12. Analysis and Design of Floor Diaphragms
13. Analysis and Design of Foundations

**Motivation:** Familiarity with properties and behavior of reinforced concrete and ductile design of various reinforced concrete components and systems is essential for a successful professional carrier in high-end structural engineering environments.

**Course Outcomes:** Students will be able to understand the behavior of various reinforced concrete structural systems and components and apply this understanding towards design of real life reinforced concrete structural systems and components.

**Reading:**

Readings consist of presentation-style handouts prepared on each topic, each of which will be distributed a day or two before the lecture at which the material is covered.

**Prerequisite:** N/A

**Grading Criteria:**

Project 30%

Mid-Term Exam 30%

Final Exam 30%

Participation (homework, attendance, etc.) 10%
CEE231P Advanced Foundation Engineering

Lecturer: Professor Anne Lemnitzer  alemnitz@uci.edu

Lecture Topics:

1. Introduction, Soil exploration, Analysis and Interpretation of Soil Exploration Data, Estimation of Soil Parameters for Foundation Design
2. Methods for Bearing Capacity Estimation
3. Total and Differential Settlements of Spread Footings and Mat Foundations.
4. Analysis and Design of Individual Footings, Strip Footings, Combined Footing, Mat foundations Idealized as either Rigid or Flexible.
5. Analysis and Design of Single Piles and Pile Groups for Various Loads
6. Pile Load Testing
7. Settlement of Pile Foundations
8. Codes and Standards for Design of Foundation Components and Systems
9. Soil-Foundation-Structure Interaction
10. Example Projects and Applications.

Motivation: Familiarity with analysis and design of foundation systems is essential for a successful professional carrier in structural engineering. Essentials for design and analysis of structural members that transmit superstructure loads to the ground. Topics include subsurface investigations, excavation, dewatering, bracing, footing, mat foundations, piles and pile foundations, caissons and cofferdams, other special foundations environments.

Course Outcomes: Students will learn design and analysis of structural members that transmit superstructure loads to the ground. They will learn about subsurface investigations, excavation, dewatering, bracing, footing, mat foundations, piles and pile foundations, caissons and cofferdams, and other special foundations.

Reading:

Readings consist of presentation-style handouts prepared on each topic, each of which will be distributed a day or two before the lecture at which the material is covered.

Prerequisite: N/A

Grading Criteria:

Project 30%

Mid-Term Exam 30%

Final Exam 30%

Participation (homework, attendance, etc.) 10%
CEE259P Advanced Structural Analysis

Lecturer: Professor Lizhi Sun  lsun@uci.edu

Lecture Topics:

1. Introduction to Matrix Methods for Structural Analysis
2. Virtual Work Principles
3. Element Stiffness Matrices and Load Vectors
4. Direct Assembly Procedures
5. Equation Solution Techniques
6. Analysis of Two- and Three-Dimensional Truss and Frame Structures
7. Analysis for Thermal Loads
8. Sub-Structuring and Condensation Techniques for Large Systems
10. Example Projects and Applications.

Motivation: Familiarity with theoretical development and computer implementation of direct stiffness method of structural analysis is essential for a successful professional career in high-end structural engineering practice.

Course Outcomes: Students will understand and can apply the theoretical basis of modern structural analysis and can effectively and efficiently use various computer analysis tools in their practice.

Reading:

Readings consist of presentation-style handouts prepared on each topic, each of which will be distributed a day or two before the lecture at which the material is covered.

Prerequisite: N/A

Grading Criteria:

Project 30%

Mid-Term Exam 30%

Final Exam 30%
CEE294P Nonlinear Structural Analysis

Lecturer: TBD

Lecture Topics:

1. Introduction to Methods of Geometric and Material Nonlinear Analysis
2. Modeling Approaches for Framed and Wall Structures
3. Large-Displacement Analysis
4. Concentrated and Distributed Plasticity Models
5. Nonlinear Solution Methods
6. Static Nonlinear Analysis
7. Dynamic Nonlinear Analysis
8. Incremental Nonlinear Dynamic Analysis

Motivation: Understanding the theoretical development and computer implementation of nonlinear structural analysis is essential for advanced structural engineering practice.

Course Outcomes: Students will be able to effectively apply nonlinear analysis techniques for evaluation and design of various structural systems.

Reading:

Readings consist of presentation-style handouts prepared on each topic, each of which will be distributed a day or two before the lecture at which the material is covered.

Prerequisite: CEE259P

Grading Criteria:

Project 30%
Mid-Term Exam 30%
Final Exam 30%
Participation (homework, attendance, etc.) 10%
CEE295P Seismic Design of Structures with Protective Systems

Lecturer: Professor Farzad Naeim fnaeim@uci.edu

Lecture Topics:

1. Introduction to Protective Systems for Seismic Resistance
2. Theoretical Basis of Seismic Isolation
3. Isolation System Components
4. High Damping Rubber Devices
5. Lead Rubber Bearing Devices
6. Friction Pendulum Devices
7. Codes and Standards for Seismic Isolation
8. Buckling and Stability of Isolators;
9. Analysis and Design Viscous Energy Dissipating Devices
10. Analysis and Design of Viscoelastic Energy Dissipating Devices
11. Analysis and Design of Friction Energy Dissipating Devices
12. Codes and Standards for Design of Energy Dissipating Devices

Motivation: Understanding the purpose and application of seismic isolation and energy dissipation devices and systems is essential for advanced structural engineering practice in seismic regions.

Course Outcomes: Students will be able to effectively analyze and design structural systems with protective systems incorporating seismic isolation and energy dissipation components and systems.

Reading:

Readings consist of presentation-style handouts prepared on each topic, each of which will be distributed a day or two before the lecture at which the material is covered.

Prerequisite: CEE249P

Grading Criteria:

Project 30%

Mid-Term Exam 30%

Final Exam 30%

Participation (homework, attendance, etc.) 10%
CEE296P Ocean and Coastal Structural Engineering

Lecturer: Martin L. Eskijian, P.E.

Lecture Topics:

   1. Wave theories and Morison’s Equation, Linear, Stokes, Cnoidal and Solitary Wave Theory, Simplified Load equations for piles
   2. Wind/Wave Hindcasting and Wave Spectra, Hindcast Modeling, Generation of Wave Spectra
   3. Sediment Transport, Longshore Transport, Underkeel Clearance, Squat, Scour
   4. Fixed Mooring and Berthing Analyses, Berthing Analysis, Fixed Wharf/pier Mooring Analysis, Passing Vessel loads
   5. Offshore Moorings, Catenary Curves, Anchoring Systems, Small craft Offshore Marinas
   6. Facility Inspection and Maintenance
   7. Offshore Submerged Pipeline Systems, Offshore Platforms
   8. Example Projects and Applications.

Motivation: The course will introduce the student to wave theories, forces and near shore structures subject to wind, wave, current and other environmental loads, and structural loads induced by moored or passing vessels. The course will include Morison’s equation, wave/wind hindcasting, sediment transport, fixed mooring/berthing, offshore moorings, soil-structure interaction for marine structures, underwater inspection and life cycle issues, performance based design, offshore submerged pipelines, and other marine structures and loads.

Course Outcomes:

1. Ocean waves and current forces
   a. Understand various ocean wave theories; current and wave forces on marine structures.
   b. Students will analyze isolated pile structural components, subject to wave and current forces.
2. The Marine Environment
   a. Students will be introduced to wind/wave hindcasting
   b. Be able to generate maximum wind waves knowing the fetch
3. Vessel forces and motion when moored
   a. Become familiar with the equations to determine wind/current forces on vessels, then transferred to marine structures
   b. Understand vessel berthing and associated instrumentation
4. Become familiar with other types of marine structures

Reading:

Readings consist of presentation-style handouts prepared on each topic, each of which will be distributed a day or two before the lecture at which the material is covered.

Prerequisite: CEE249P

Grading Criteria:

Project 30%
Mid-Term Exam 30%
Final Exam 30%
Participation (homework, attendance, etc.) 10%
CEE297P State of the Art in Structural Engineering

Coordinator: Professor Farzad Naeim fnaeim@uci.edu

Lecturers: Nationally and Internationally Recognized Experts

Lecture Topics:

- Direct Displacement-Based Seismic Design of Structures
- Experimental Research in Earthquake Engineering
- Earthquake Forecasting Applications and Cybershake
- Seismic Resiliency and Seismic Rating Systems
- Seismic Instrumentation and its Applications and Benefits
- Soil-Foundation-Structure Interaction
- Slope Stability Issues and solutions
- Virtual Wall Institute and Collaborative Experimental Research on Structural Walls
- Earthquake Induced Liquefaction and Subsidence problems and their Mitigation
- Other Subjects as Needed

Motivation: Exposing students to lectures by internationally recognized experts in each field of discussion.

Course Outcomes: Students will take advantage of a series of short courses presented by nationally and internationally recognized experts on each subject matter.

Reading:

Readings consist of presentation-style handouts prepared on each topic, each of which will be distributed before the lecture at which the material is covered.

Prerequisite: CEE249P

Grading Criteria:

Pass / No Pass
ENGRCEE 260P Desalination

Lecturer: Professor Sunny C. Jiang sjiang@uci.edu

Lecture Topics:
- History and contemporary context for desalination
- Feedwater intake and pretreatment
- Desalination processes
- Biofouling and treatments
- Concentrate and residuals management
- Environmental issues

Course Objective: Introduces desalination technology to environmental engineering graduate students in the context of water, energy and environment nexus.

Prerequisites By Topic: General Chemistry; Water treatment

Computer Usage: Powerpoint, Word, Excel and other graphic image software

Grading Criteria:  
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<td>Quizzes</td>
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<td>Presentation</td>
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<td>Participation</td>
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ENGRCEE 263P Advanced Biological Processes

Lecturer: TBD

Lecture Topics: Analysis of biological processes in natural and engineered systems. Biological treatment processes, both aerobic and anaerobic, with emphasis on suspended growth systems including design consideration. Contaminant degradation or control covered. Includes laboratory on molecular tools used in wastewater treatment. Fundamentals of bacterial reactors for water and wastewater. Dynamics and control of aerobic, anoxic, and anaerobic processes. Topics include activated sludge processes, biological nutrient removal, biomass digestion

Prerequisites by topic: Organic chemistry, environmental chemistry, an introduction to water and wastewater treatment

Prerequisite material: Mass balance analysis; reactor theory (batch, PFR, CSTR); bacterial kinetics (growth and decay, Monod equation); BOD and COD stoichiometry.

Class Schedule: Meets for 3 hours of lecture and 1 hour of discussion per week for 10 weeks.

Computer Usage: Students will use process simulation software, such as BioWin, GPSX, West.

Grading Criteria: Homework 45%, Final 40%, Participation 15%
ENGRCEE 264P Carbon Footprint Analysis of Water and Wastewater Systems

Lecturer: Professor Diego Rosso bidui@uci.edu

Lecture Topics:
- The water-energy nexus
- Carbon and carbon-equivalent emissions
- Methodologies for compiling inventories
- Life-cycle assessment and carbon-footprint analysis
- Energy flow analysis (on-line lecture)
- Process energy dynamics
- Membrane process analysis
- Case study I: Water reuse
- Mass flow analysis
- Aerobic process configurations
- IRWD process
- Novel mainstream processes
- Anaerobic process analysis
- Anaerobic process analysis
- Novel sidestream processes (on-line lecture, not in class)
- Preliminary operations
- Biosolids disposal
- Carbon sequestration potential of WWT

Course description: Mass- and energy- balance analysis applied to water and wastewater treatment systems. Case studies include analysis of water supply, treatment, reclamation, and reuse.

Prerequisite: ENGRCEE 160

Grading: Homework 60% (4 x 15%) + Final report 15% + Final presentation 15% + Participation 10%.
ENGRCEE 265P Physical-Chemical Treatment Processes

Lecturer: Professor Diego Rosso bidui@uci.edu

Lecture Topics: Water and Wastewater Constituents
Load dynamics
Gravity separation
Gas Transfer in clean water
Gas Transfer in contaminated water
Aeration dynamics
Aeration energy
Chemical and Biological Reactors
Coagulation/Flocculation
Granular Filtration
Membrane Filtration
Reverse Osmosis
Adsorption
Disinfection
Thermal Processes
Advanced Oxidation

Course description: Theory and dynamics of physical and chemical separation processes in water and wastewater treatment. Topics include coagulation, sedimentation, filtration, gas transfer, membrane separations, and adsorption.

Prerequisite course: ENGRCEE160

Prerequisite material (review ahead of the quarter if needed): Mass balance analysis; basic reactor theory (batch, PFR, CSTR); bacterial kinetics (growth and decay, Monod equation); BOD and COD stoichiometry.

Textbook (either edition of M&E is acceptable):


Grading: Homework 15% (3x5% each) + Participation 10% + Midterm 35% + Final exam 40%.
UPP 139P - WATER RESOURCE POLICY

Lecturer: Professor David L Feldman feldmand@uci.edu

Course description: Freshwater is our planet’s most precious resource. Yet, while life as we know it must have water to survive, many people face difficulty finding safe, clean water. A U.S. State Department report contends that the world’s thirst for water may become a human security issue within 20 years. The World Bank reports that many developing nations face a crisis from intensive irrigation, urbanization, diminishing supplies, and deteriorating infrastructure; and, a 2017 UN report asserts that in many places three imminent challenges regarding freshwater: (1) demands by agriculture, cities, industry, and energy production are incessantly increasing; (2) severe pollution from new types of contaminants, inadequate wastewater treatment, and growing water withdrawals are limiting the capacity of waterways to dilute contaminants and support aquatic life; and, (3) climate change is causing periods of frequent and severe droughts – punctuated by acute periods of flooding.

The goal of this course is to illuminate how the governance of freshwater is a political, social, economic, and environmental challenge and to suggest ways we can manage it fairly and sustainably. The management and provision of water are not merely technical problems whose resolution hinges on hydrological principle, cost, or engineering feasibility. They are products of decisions made by governments, businesses, and interest groups that exercise control over who has access to water, how they use it, and in what condition they receive it. We will discuss basic knowledge about water supply and quality; the evolution of water policy in different societies; the importance of water to human and ecological health; the role of law, politics, and markets in its allocation, use, and protection; and, the importance of ethics and values for its equitable provision.

Much of our attention will be on the global competition for water, and the impacts of this competition on conflicts over supply and quality – in places as diverse as the Middle East, Europe, Africa, Latin America, and Asia. While disputes over water are found virtually everywhere, we will also pay special attention to the U.S., especially the West and California – where water has long been a focal point of political contention. My objectives in this course are three-fold:

• To enable you to understand and analyze water problems and think creatively about possible solutions. Here in Southern California, many policy innovations are being introduced that have world-wide application, including conservation and innovative pricing systems, reclaiming of waste-water and stormwater, and de-salination, among others.
• To help you understand the importance of different fields of study to water resource policy – including social ecology, urban studies, social sciences, bioscience, public health, earth
• To help you apply what you learn in the course to improve water management in your own backyard: this includes your local watershed, and even your household – stewardship over this precious resource begins with personal awareness, a willingness to change one’s behavior, and a commitment to life-long service to one’s community.

Required Texts – for Purchase:

Required Readings  


Requirements - undergraduates:
- 2 quizzes (during weeks 4 and 8). These are based on basic concepts, definitions, and ideas generated from the readings & lectures. Each is worth 25% of your grade (50% total).
- 1 short paper (<800 words or 3-4 pages - due week 9); worth 25% of your grade.
- Final exam/quiz, 25% of
EECS 250P DIGITAL SIGNAL PROCESSING I

Catalog Data:
EECS 250P Digital Signal Processing I (Credit Units: 4) Fundamental principles of digital signal processing, sampling, decimation and interpolation, discrete Fourier transforms and FFT algorithms, transversal and recursive filter, discrete random processes, and finite-word effects in digital filters. Prerequisite: EECS152A. Graduate students only. (Design units: 0)

Required Textbook:

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:
Fundamental principles of digital signal processing,
Sampling, Decimation and Interpolation,
Discrete Fourier Transforms and FFT algorithms,
Transversal and recursive filter,

Discrete random processes,

Finite-word effects in digital filters.

Linear Prediction and Optimum Linear Filters

Adaptive Filters (RLS and LMS algorithms)

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component

Design Content Description

Approach:
Lectures:
Laboratory Portion:

Grading Criteria:

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<th>Component</th>
<th>Percentage</th>
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<td>Homework</td>
<td>10%</td>
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<td>Midterm Exam</td>
<td>45%</td>
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<td>Final Exam</td>
<td>45%</td>
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Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  Engineering Science: 0.0 credit units
  Engineering Design: 0.0 credit units

Prepared:
Senate Approved:
Approved Effective:
EECS 202BP TECHNIQUES IN MEDICAL IMAGING I

Catalog Data:
EECS 202BP Techniques in Medical Imaging I: X-ray, Nuclear, and NMR Imaging (Credit Units: 4) Ionizing radiation, planar and tomographic radiographic and nuclear imaging, magnetism, NMR, MRI imaging. Prerequisite: EECS203AP. Professional master students only. Same as PHYSICS 233B. Concurrent with PHYSICS 147B. (Design units: 0)

Required Textbook:
Lecture Notes will Provided for Each Section

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:

- Spin Physics
- Imaging Physics
- Imaging acquisition and reconstruction
- Clinical MRI Applications
- MR Systems
- fMRI and DTI for Neuroimaging
- X-ray, Gamma-ray imaging
- MR Cancer Imaging
- Nuclear Medicine Imaging
- Nuclear Medicine for Neuro and Cancer Imaging

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage: YES

Laboratory Projects:

Professional Component

Design Content Description
Approach:
Lectures:
Laboratory Portion:

Grading Criteria:

Homework and Projects  40%
Midterm Exam          30%
Final Project         30%

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
   Engineering Science: 0.0 credit units
   Engineering Design: 0.0 credit units

Prepared:

Senate Approved:

Approved Effective:
EECS 211P ADVANCED SYSTEM SOFTWARE

Catalog Data:
EECS 211P Advanced System Software (Credit Units: 4) Study of operating systems including interprocess communication, scheduling, resource management, concurrency, reliability, validation, protection and security, and distributed computing support. System software design languages and modeling analysis. Professional master students only. (Design units: 0)

Required Textbook:

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
System Software (EECS 111) and Organization of Digital Computers (EECS 112)

Lecture Topics:
Processes, threads, scheduling
Memory Management
Virtual Memory
Embedded software and hardware
File systems, interface and implementation
I/O systems
Protection
Security, cryptography

Class Schedule:
Meets for 3 hours of lecture and 1 hour of discussion each week for 10 weeks.

Computer Usage: YES

Laboratory Projects: YES
Professional Component

Design Content Description

Approach:

Lectures:

Laboratory Portion:

Grading Criteria:

Quiz and in class assignments 10%

Lab assignment 30% (programming part 25% and quiz 5%)

Mid term 30%

Final exam 30%

Estimated ABET Category Content:

Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  Engineering Science: 0.0 credit units
  Engineering Design: 0.0 credit units

Prepared:

Senate Approved:

Approved Effective:
EECS 213P COMPUTER ARCHITECTURE

Catalog Data:
EECS 213P Computer Architecture (Credit Units: 4) Problems in hardware, firmware (microprogram), and software. Computer architecture for resource sharing, real-time applications, parallelism, microprogramming, and fault tolerance. Various architectures based on cost/performance and current technology. Professional master students only. (Design units: 0)

Required Textbook:
Computer Architecture: A Quantitative Approach,
By: Hennessy and Patterson, 5th Edition

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
Organization of Digital Computers (EECS 112) and Organization of Digital Computers Laboratory (EECS 112L)

Lecture Topics:
Memory Systems
Microarchitecture
High Performance Computing (HPC)
Graphics Processing Unit (GPU)
System-on-Chip (SoC) and Network-on-Chip (NoC)

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage: YES

Laboratory Projects: NO

Professional Component

Grading Criteria:
HWs/Assignments/Quizes 30%
Midterm 35%
Final 35%

Prepared:
Senate Approved:

Approved Effective:
EECS 215P DESIGN AND ANALYSIS OF ALGORITHMS

Catalog Data:
EECS 215P Design and Analysis of Algorithms (Credit Units: 4) Computer algorithms from a practical standpoint. Algorithms for symbolic and numeric problems such as sorting, searching, graphs, and network flow. Analysis includes algorithm time and space complexity. (Design units: 0)

Required Textbook:

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:
Asymptotic notation
Sorting and sorting algorithms
Data structures
Graph algorithms
Minimum spanning trees
Shortest paths
Dynamic programming
Parallel algorithms

Class Schedule:
Meets for 3 hours of lecture and 1 hour of discussion each week for 10 weeks.

Computer Usage: YES

Laboratory Projects:

Professional Component

Design Content Description
Approach:

Lectures:
**Laboratory Portion:**

**Grading Criteria:**

- Homeworks (40%)
- Midterm (20%)
- Final Exam (40%)

**Estimated ABET Category Content:**
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
   - Engineering Science: 0.0 credit units
   - Engineering Design: 0.0 credit units

**Prepared:**

**Senate Approved:**

**Approved Effective:**
EECS 217P VLSI SYSTEM DESIGN

Catalog Data:
EECS 217P VLSI System Design (Credit Units: 4) Overview of integrated fabrication, circuit simulation, basic device physics, device layout, timing; MOS logic design; layout generation, module generation, techniques for very large scale integrated circuit design. Professional master students only. (Design units: 0)

Required Textbook: TBD
Recommended Textbook: None

References: None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
Organization of Digital Computers (EECS 112)

Lecture Topics:
None.

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component

Design Content Description
Approach:
Lectures:
Laboratory Portion:

Grading Criteria:

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
   Engineering Science: 0.0 credit units
   Engineering Design: 0.0 credit units
EECS 220P ADVANCED DIGITAL SIGNAL PROCESSING ARCHITECTURE

Catalog Data:
EECS 220P Advanced Digital Signal Processing Architecture (Credit Units: 4) Study the latest DSP architectures for applications in communication (wired and wireless) and multimedia processing. Emphasis given to understanding the current design techniques and to evaluate the performance, power, and application domain of the latest DSP processors. Prerequisite: EECS 213P. Professional master students only. (Design units: 0)

Required Textbook:
Selected DSP architecture papers that will be provided

Recommended Textbook:

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:
Advanced Architectural Topics in Digital Signal Processing (DSP), High Performance Computing (HPC), IoT, and Servers

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component

Design Content Description Approach:
Lectures:
Laboratory Portion:

Grading Criteria:
Project 40%
Class Presentation 25%
Midterm 15%
Final 20%

**Estimated ABET Category Content:**
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  - Engineering Science: 0.0 credit units
  - Engineering Design: 0.0 credit units

**Prepared:**

**Senate Approved:**

**Approved Effective:**
EECS 223P REAL-TIME COMPUTER SYSTEMS

Catalog Data:
EECS 223P Real-Time Computer Systems (Credit Units: 4) Time bases, clock synchronization, real-time communication protocols, specification of requirements, task scheduling. Validation of timelines, real-time configuration management. Prerequisite: EECS 211P and EECS 213P. Professional master students only. (Design units: 0)

Required Textbook:
By Giorgio C. Buttazzo
Springer, 2005 or 2011

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:
Intro to Real-time Systems
Periodic Task Scheduling
Aperiodic Task Scheduling
Fixed-Priority Servers
Dynamic Priority Servers
Resource Access Protocols
RTOS
CPS, IoT

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage: YES

Laboratory Projects:

Professional Component

Design Content Description
Approach:
Lectures:
Laboratory Portion:

Grading Criteria:

- Midterm examination: 30%
- Final examination: 40%
- Homework and Projects: 30%

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  - Engineering Science: 0.0 credit units
  - Engineering Design: 0.0 credit units

Prepared:

Senate Approved:

Approved Effective:
EECS 240P RANDOM PROCESSES

Catalog Data:
EECS 240P Random Processes (Credit Units: 4) Extensions of probability theory to random variables varying with time. General properties of stochastic processes. Convergence. Estimation, including nonlinear and linear minimum mean square error and maximum likelihood. Spectral density and linear filters. Poisson processes and discrete-time Markov chains. Professional master students only. (Design units: 0)

Required Textbook:

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
Engineering Probability (EECS 55) or equivalent

Lecture Topics:
Introduction on probability
Random variables and vectors
Conditional probabilities and expectations
Moment generating functions
Convergences
Laws of large numbers and central limit theorems
Estimation of mean and variance
Random processes
Stationarity
Independent increments
Examples of random processes (Gaussian, Poisson, Wiener, ...) Ergodic theorems
Calculus for random processes
Power spectral density
Linear systems, optimal linear prediction
Markov chains

Class Schedule:
Meets for 3 hours of lecture and 1 hour of discussion each week for 10 weeks.

Computer Usage:
Laboratory Projects:

Professional Component

Design Content Description

Approach:

Lectures:

Laboratory Portion:

Grading Criteria: The grade in this course is based on home-works (10%), computer projects (20%), a midterm (30%), and a final examination (40%). The grade for some of the home-work problems and computer projects may be only based on the effort and not the correctness of the answer.

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
   Engineering Science: 0.0 credit units
   Engineering Design: 0.0 credit units

Prepared:

Senate Approved:

Approved Effective:
EECS 241AP DIGITAL COMMUNICATIONS I

Catalog Data:
EECS 241AP Digital Communications I (Credit Units: 4) Concepts and applications of digital communication systems. Baseband digital transmission of binary, multi-amplitude, and multi-dimensional signals. Introduction to and performance analysis of different modulation schemes. (Design units: 0)

Required Textbook:

Recommended Textbook: TBD

References:

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:
Random signals, response of linear systems to random signals, vector and signal spaces, maximum a posteriori and maximum likelihood detection, optimum receivers, digital modulation: PAM, QAM, PSK, FSK, MSK, DPSK, orthogonal, biorthogonal, and simplex signaling, coherent and noncoherent detection, probability of error and power spectra analysis of digital modulation techniques, maximum likelihood sequence detection (Viterbi algorithm) (Ch. 2, 3, 4 of text).

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage: NO
Laboratory Projects:

Professional Component

Design Content Description

Approach:
Lectures:
Laboratory Portion:

Grading Criteria:
Homework 15%
Midterm 35%
Final Exam 50%
Bonus project.

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  Engineering Science: 0.0 credit units
  Engineering Design: 0.0 credit units

Prepared:
Senate Approved:

Approved Effective:
EECS 241BP DIGITAL COMMUNICATIONS II

Catalog Data:
EECS 241BP Digital Communications II (Credit Units: 4) Concepts and applications of equalization, multi-carrier modulation, spread spectrum and CDMA. Digital communications through fading memory channels. Prerequisite: EECS241AP. Professional master students only. (Design units: 0)

Required Textbook:

Recommended Textbook: TBD

References:

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:
Signaling for Bandlimited Channels, Wiener Filtering, Zero Forcing and Minimum Mean Squared Error Criteria, Linear Equalization, Adaptive Linear Equalization, Fractionally Spaced and Decision Feedback Equalization, Maximum Likelihood Sequence Estimation for Equalization, Synchronization, Multi-Carrier Modulation, Spread Spectrum

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage: NO

Laboratory Projects:

Professional Component

Design Content Description
Approach:
Lectures:
Laboratory Portion:

Grading Criteria:
Homework 15%
Midterm 35%
Final Exam 50%
Bonu project.

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
   Engineering Science: 0.0 credit units
   Engineering Design: 0.0 credit units

Prepared:

Senate Approved:

Approved Effective:
EECS 244P WIRELESS COMMUNICATIONS

Catalog Data:
EECS 244P Wireless Communications (Credit Units: 4) Introduction to wireless communications systems. Wireless channel modeling. Single carries, spread spectrum, and multi-carrier wireless modulation schemes. Diversity techniques. Multiple-access schemes. Transceiver design and system level tradeoffs. Brief overview of GSM, CDMA, (IS-95) and 2.5, 3G cellular schemes. Prerequisite: EECS241BP. Professional master students only. (Design units: 0)

Required Textbook:

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:
Wireless propagation fundamentals
Diversity
Capacity
Beamforming
Narrowband modulations
Spread spectrum
WCDMA physical layer

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage: YES

Laboratory Projects:

Professional Component

Design Content Description
Approach:
Lectures:
Laboratory Portion:

Grading Criteria:
Midterm: 30 %
Final: 40 %
Project: 30 %

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  Engineering Science: 0.0 credit units
  Engineering Design: 0.0 credit units

Prepared:

Senate Approved:

Approved Effective:
EECS 270AP ADVANCED ANALOG INTEGRATED CIRCUIT DESIGN I

Catalog Data:
EECS 270AP Advanced Analog Integrated Circuit Design I (Credit Units: 4) Basic transistor configurations; differential pairs; active load/current sources; supply/temperature-independent biasing; op-amp gain and output stages; amplifier frequency response and stability compensation; non-idealities in op-amps; noise and dynamic range in analog circuits. Professional master students only. (Design units: 0)

Required Textbook:
Design of Analog CMOS Integrated Circuits 2nd Edition
Behzad Razavi

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
Introduction to Control Systems (EECS 160A) and Electronics III (EECS 170C) or equivalent

Lecture Topics:
Single Amplifiers
Differential Amplifiers
Amplifiers and Current Mirrors
Frequency Response Analysis
Noise Analysis
OpAmp Technologies
Stability Analysis

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage: YES

Laboratory Projects:

Professional Component

Design Content Description
Approach:
Lectures:

Laboratory Portion:

Grading Criteria:

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<th>Percentage</th>
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<td>Final</td>
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<td>Project</td>
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Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  - Engineering Science: 0.0 credit units
  - Engineering Design: 0.0 credit units

Prepared:

Senate Approved:

Approved Effective:
EECS 270BP ADVANCED ANALOG INTEGRATED CIRCUIT DESIGN II

Catalog Data:
EECS 270BP Advanced Analog Integrated Circuit Design II (Credit Units: 4) Advanced transistor modeling issues; discrete-time and continuous-time analog Integrated Circuit (IC) filters; phase-locked loops; design of ICs operating at radio frequencies; low-voltage/low-power design techniques; A/D and D/A converters; AGC circuits. Prerequisite: EECS270AP. Professional master students only. (Design units: 0)

Required Textbook: TBD
Behzad Razavi, Design of Analog CMOS Integrated Circuits, McGraw-Hill Higher Education;
List of papers for the class will be provided

Recommended Textbook: TBD

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:
Advanced topics in analog integrated circuits:
Oscillators;
Phase-locked loops and delay-locked loops;
Introduction to switched capacitor circuits;
Comparators;
Nyquist-rate A/D and D/A converters.

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component

Design Content Description

Approach:

Lectures:

Laboratory Portion:
Grading Criteria:

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<th>Item</th>
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<td>Final</td>
<td>40%</td>
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Estimated ABET Category Content:
- Mathematics and Basic Science: 0.0 credit units
- Computing: 0.0 credit units
- Engineering Topics: 0.0 credit units
  - Engineering Science: 0.0 credit units
  - Engineering Design: 0.0 credit units

Prepared:

Senate Approved:

Approved Effective:
EECS 270DP RADIO-FREQUENCY INTEGRATED CIRCUIT DESIGN

Catalog Data:
EECS 270DP Radio-Frequency Integrated Circuit Design (Credit Units: 4) Topics include: RF component modeling; matching network design; transmission line theory/modeling; Smith chart and S-parameters; noise modeling of active and passive components; high-frequency amplifier design; low-noise amplifier (LNA) design; mixer design; RF power amplifier. Prerequisite: EECS270AP. Professional master students only. (Design units: 0)

Required Textbook:
Hooman Darabi, Radio-Frequency Integrated Circuits and Systems, Cambridge University Press, 2015 (D)

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:
Advanced topics in radio-frequency integrated circuits design;
Basic concepts in RF design;
Receiver and transmitter architectures;
Matching circuits and designing these matching circuits using smith chart;
Low-noise amplifier(s);
Mixers;
Power amplifiers.

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component

Design Content Description

Approach:

Lectures:
Laboratory Portion:

Grading Criteria:

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<td>Final</td>
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Estimated ABET Category Content:
- Mathematics and Basic Science: 0.0 credit units
- Computing: 0.0 credit units
- Engineering Topics: 0.0 credit units
  - Engineering Science: 0.0 credit units
  - Engineering Design: 0.0 credit units

Prepared:

Senate Approved:

Approved Effective:
EECS 280AP ADVANCED ENGINEERING ELECTROMAGNETICS I

Catalog Data:
EECS 280AP Advanced Engineering Electromagnetics I (Credit Units: 4) Stationary electromagnetic fields, Maxwell's equations, circuits and transmission lines, plane waves, guided waves, and radiation. Professional master students only. (Design units: 0)

Required Textbook: TBD

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
Engineering Electromagnetics I (EECS 180A)

Lecture Topics:
Time harmonic fields
Poynting theorem
Wave propagation in dielectric stacks
Reflection and Refraction of waves from dielectric media
Waves on metal boundaries
Theory of radiation from dipole antennas
Waveguides

Class Schedule:
Meets for 3 hours of lecture and 1 hour of discussion each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component

Design Content Description

Approach:
Lectures:
Laboratory Portion:

Grading Criteria:

- Homework 15%
- Project 15%
- Midterm Exam 30%
- Final Exam: 40%

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  Engineering Science: 0.0 credit units
  Engineering Design: 0.0 credit units

Prepared:

Senate Approved:

Approved Effective:
EECS 285AP OPTICAL COMMUNICATIONS

Catalog Data:
EECS 285AP Optical Communications (Credit Units: 4) Introduction to fiber optic communication systems, optical and electro-optic materials, and high-speed optical modulation and switching devices. (Design units: 0)

Required Textbook:

Recommended Textbook:
Optical Fiber Communications: Principles and Practice (3rd Edition), by John Senior
Optical Networks, by R. Ramaswami, Morgan Kaufman, 2nd Ed.
Photonics, by A. Yariv, and P. Yeh, Oxford Univ. Press, 6th Ed.
Optical Fiber Telecommunications, by Kaminow& Li, Academic Press
WDM Technologies, by Dutta, Dutta and Fujiwara, Academic Press

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
Undergraduate level Engineering Electromagnetics I (EECS E80A) or equivalent.

Lecture Topics:
Light and Light Sources
Photodetectors
Noise in Detection, BER Estimation, and SNR
Optical Modulation Techniques
Optical Fibers
Dispersion and Dispersion Management
Nonlinearity in Fibers
Optical Amplification
Amplifier Noise, Total SNR and Link Budget Calculations

Class Schedule:
Meets for 3 hours of lecture and 1 hour of discussion each week for 10 weeks.

Computer Usage: YES

Laboratory Projects:

Professional Component

Design Content Description

Approach:
Lectures:
Laboratory Portion:

Grading Criteria:

Homework 15%
VPI Projects 15% (5% HW +10% project)
Midterm 30%
Final 40%

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
   Engineering Science: 0.0 credit units
   Engineering Design: 0.0 credit units

Prepared:
Senate Approved:
Approved Effective:
EECS 280CP RF ANTENNA DESIGN

Catalog Data:
EECS 280CP RF Antenna Design (Credit Units: 4) Advanced transmission line design, radiation of electromagnetic waves, dipole antennas, antenna arrays, advanced antenna designs and practical design considerations in communications systems. Course is supplemented by RF design tools and modeling. EECS 280A or equivalent knowledge is required.

Required Textbook:
Antenna Theory and Design, by Constantine Balanis, 4th Ed.

Recommended Textbook:
None

References:
None

Coordinator:

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
Advanced Engineering Electromagnetics I (EECS 280A) or equivalent.

Lecture Topics:
Types of antennas
Radiation mechanism
Radiation pattern
Radiation integrals
Linear wire antennas and dipoles
Loop antennas
Antenna arrays
Advanced topics

Class Schedule:
Meets for 3 hours of lecture and 1 hour of discussion each week for 10 weeks.

Computer Usage: YES

Laboratory Projects:

Professional Component

Design Content Description

Approach:
Lectures:
Laboratory Portion:
Grading Criteria:

Homework 20%
Midterm 30%
Final 30%
Projects 20%

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  Engineering Science: 0.0 credit units
  Engineering Design: 0.0 credit units

Prepared:
Senate Approved:

Approved Effective:
# MAE 247P MICROSYSTEMS DESIGN

<table>
<thead>
<tr>
<th>Instructor</th>
<th><strong>Prof. Andrei M. Shkel</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4202 Engineering Gateway</td>
</tr>
<tr>
<td></td>
<td>Email: <a href="mailto:andrei.shkel@uci.edu">andrei.shkel@uci.edu</a></td>
</tr>
<tr>
<td></td>
<td>Phone: (949) 824-3843</td>
</tr>
<tr>
<td>Grader</td>
<td>TBD</td>
</tr>
<tr>
<td>Course Time and</td>
<td>Time: TBD</td>
</tr>
<tr>
<td>Location</td>
<td>Place: TBD</td>
</tr>
<tr>
<td>Instructor’s Office</td>
<td>TBD</td>
</tr>
<tr>
<td>Class homepage</td>
<td>TBD</td>
</tr>
</tbody>
</table>

**Tentative Grading:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>(90-100) Homework - <strong>10%</strong> (typically due on Mondays in class). Selectively graded.</td>
</tr>
<tr>
<td>B</td>
<td>(80-89) Midterm - <strong>40%</strong> (in-class)</td>
</tr>
<tr>
<td>C</td>
<td>(70-79) Final Design Project - <strong>50%</strong> (assigned on Nov 7th and due on Nov 28th in class).</td>
</tr>
<tr>
<td>D</td>
<td>(50-69) Grading of the final design project includes:</td>
</tr>
<tr>
<td>F</td>
<td>(0-49) proposal, design, layout, 6 pages written report, oral presentation (Nov. 28 &amp; Nov. 30)</td>
</tr>
</tbody>
</table>

**Make up lectures**

Make-up lectures will be pre-recorded and available on UCI Replay (and on class website)

**HWs Policy**

Students are required to submit their HWs in electronic form. Each HW will include an electron quiz. It is very important to respond to the quiz. HWs will be graded selectively, and all solution will be available on the class website. The final project progress report (Week 8) is counted as weekly HWs.
<table>
<thead>
<tr>
<th>Midterm</th>
<th>Midterm will be closed book and closed notes. However, you will be allowed to bring <strong>one</strong> sheet of paper on which you can write important equations, etc. The midterm exam is in-class and 80 minutes long, tentatively on TBD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Design Project</td>
<td>The final event in this course leveraging activities during all 10 weeks) will be a Product Design Project. Our theme this year is “MEMS Oscillators for ...”. In this project, you should find a design problem of interest to you, which will be utilizing a MEMS Oscillator. The problem should concern a proposed new commercial product or research instrument that will be based on your own resonator design. It should rely either on design of a resonator that have been demonstrated by researchers elsewhere or an original design proposed by you. But, in both cases, the design should be based on the principle and fabrication process introduced in class.</td>
</tr>
<tr>
<td><strong>Proposal</strong> (due date – TBD)</td>
<td>1 page text and 1 page figures. The style of this document should grasp attention and be something you would present to a potential investor (well written, nicely formatted, and containing a persuasive description of your product). No more than one page of text and one page of pictures are allowed (since the attention span of investors is not infinite :)</td>
</tr>
<tr>
<td><strong>Teaming:</strong> This will be an individual project.</td>
<td></td>
</tr>
<tr>
<td><strong>Final Report, Presentation, Layout:</strong> due date – TBD in class (see final project guidelines). All material to be submitted electronically using the DropBox on the class website.</td>
<td></td>
</tr>
<tr>
<td><strong>Presentations:</strong> TBD in class</td>
<td></td>
</tr>
<tr>
<td><strong>Final Exam</strong></td>
<td>There will be no Final Exam in this class</td>
</tr>
<tr>
<td><strong>Required Text</strong></td>
<td>• “Practical MEMS” by Ville Kaajakari, Small Gear Publishing. (available for in-library use (two hours check-out) in the Science Library)</td>
</tr>
</tbody>
</table>
| **Suggested Texts** | • Microsystem Design” by Stephen D. Senturia, Kluwer Academic Publishers  
• “Fundamentals of Microfabrication” by Marc J. Madou  
• “Micromachined transducers sourcebook” by Kovacs, Gregory T. A., Boston, Ma.WCB  
• “Compliant mechanisms” by Howell, Larry L. New York: Wiley |
| **Suggested links** | [http://mems.eng.uci.edu](http://mems.eng.uci.edu) and links there in. |
### Software

<table>
<thead>
<tr>
<th></th>
<th>We will be extensively using Computer Aided Design (CAD) Tools: Mask Layouts – L-Edit (10 seats are available. Instructions will be provided). We will also use a new software package – CoventorWare (instructions are on the website). For assignments/project you may also use Matlab and Simulink. It is not expected that you already know these tools.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>HW</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Micro-Systems and MEMS, Overview of Micro-fabrication, materials, photolithography. Surface Micromachining process flow</td>
<td></td>
<td>Lecture 1, 2, Reader 1, Chapter 1</td>
</tr>
<tr>
<td>2</td>
<td>PolyMUMPs Process Flow and Design Rules</td>
<td></td>
<td>Lecture 3, 4, Reader 2</td>
</tr>
<tr>
<td>3</td>
<td>Compliant Mechanism Synthesis: Constitutive equations of linear elasticity. Energy loss mechanisms (material, anchor, surface, mode conversion).</td>
<td></td>
<td>Lecture 5, 6, Reader 3, Chapter 4, Appendix E, Chapter 12, Appendix B (p. 409)</td>
</tr>
<tr>
<td>5</td>
<td>Operational amplifiers, motion detection, and control circuit (position and velocity control systems). Noise in MEMS (Brownian, Johnson, amplifier, etc.)</td>
<td>Practice problems</td>
<td>Lecture 9, 10, Reader 5, Chapter 6 &amp; 8 &amp; 9, Chapter 2</td>
</tr>
<tr>
<td>6</td>
<td><strong>Mid-term.</strong> Final project introduction</td>
<td></td>
<td>Lecture 11</td>
</tr>
<tr>
<td>7</td>
<td>System integration, the interference problem, noise sources, case studies. Failure prevention in MEMS.</td>
<td>Proposal due</td>
<td>Lecture 12, 13, Reader 6, Chapter 19</td>
</tr>
<tr>
<td>Week 8</td>
<td>Electro-mechanical design of linear and non-linear oscillators</td>
<td>Progress report due</td>
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<tr>
<td></td>
<td></td>
<td>Lecture 14, 15</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Reader 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Appendix B (p. 409)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chapter 20.4.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Appendix C (p. 419)</td>
<td></td>
</tr>
<tr>
<td>Week 9</td>
<td>Intro to multi-DOF oscillatory systems on micro-scale</td>
<td>Lecture 16, 17</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Reader 8</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Chapter 22</td>
<td></td>
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<tr>
<td>Week 10</td>
<td>Final project presentations</td>
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</tr>
</tbody>
</table>
ENGRMAE 252P FUNDAMENTALS OF MICROFABRICATION

Catalog Data:
ENGRMAE 252P Fundamentals of Microfabrication (Credit Units: 4) Introduces Engineering and Science students to the science of miniaturization. Different options to make very small machines (micro and nano size) are reviewed, materials choices are discussed, scaling laws are analyzed, and many practical applications are listed. Graduate students only. (Design units: 0)

Required Textbook:

Recommended Textbook:
None

References:
None

Coordinator:
Marc J. Madou

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:
None.

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component

Design Content Description

Approach:

Lectures:

Laboratory Portion:

Grading Criteria:
Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  Engineering Science: 0.0 credit units
  Engineering Design: 0.0 credit units

Prepared:
February 22, 2017

Senate Approved:
April 30, 2013

Approved Effective:
2013 Fall Qtr
Syllabus

MAE 259P - Mechanical Behavior of Solids: Atomistic Theories

Instructor: Prof. Tim Rupert

Office: 

Phone: 

Email: 

Office Hours: 

Class Schedule: 

Textbook: No textbook is required. (I suggest purchasing a copy of Dieter’s Mechanical Metallurgy book. It contains a relatively comprehensive discussion of the mechanical behavior of metallic materials while also remaining quantitative.)


http://babel.hathitrust.org/cgi/pt?id=mdp.39015002936451;page=root;view=image;size=100;seq=11;num=iii


**Course Website:**

**Course Description:** This course will cover the microscopic mechanisms that control the mechanical behavior of materials. Plasticity, creep, shear banding, and fracture will be addressed through a discussion of how such behavior is measured and modeled. Subjects to be covered include dislocation theory, strengthening mechanisms, high temperature diffusion and grain boundary sliding, shear localization, void formation, ductile rupture, and brittle fracture.

**Prerequisites:** Basic Mechanics of Materials knowledge will be assumed.

**Grading Criteria:**

- Homework: 20%
- Midterm Exam: 35%
- Final Exam: 45%

**Midterm and Final Examination**

The midterm examination will tentatively take place during the 6th week of class.

The final examination will be scheduled during finals week (Date determined by course time).

**Academic Honesty**
In this class, student discussions regarding the homework are encouraged. However, the homework submitted for grading must be the individual work of the student. In no case are students allowed to work together or share information on the exams.
ENGRMAE 254P MECHANICS OF SOLIDS AND STRUCTURES

Catalog Data:
ENGRMAE 254P Mechanics of Solids and Structures (Credit Units: 4) Finite deformation kinematics; Stress and strain measures; Invariance in Solid Mechanics; Objective rates; constitutive theory of elastic and inelastic solids; rate formulations; computational approaches; theories of plates and shells; applications to aerospace vehicles. Graduate students only. (Design units: 0)

Required Textbook:
None

Recommended Textbook:
None

References:
None

Coordinator:
Lorenzo Valdevit

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:
None.

Class Schedule:
Meets for 3 hours of lecture and 1 hour of discussion each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component

Design Content Description

Approach:

Lectures:

Laboratory Portion:

Grading Criteria:

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
Master of Engineering SSPGDP Proposal – Samuels School of Engineering – UC Irvine

Engineering Science: 0.0 credit units
Engineering Design: 0.0 credit units

Prepared:
February 22, 2017

Senate Approved:
April 30, 2013

Approved Effective:
2013 Fall Qtr
Syllabus

MAE 257P - Fabrication and Characterization of Nanomaterials

Instructor:  Prof.

Office:  

Phone:  

Email:  

Office Hours:  

Class Schedule:  

Textbook:  No textbook is required. A number of handouts will be provided during the course; unless otherwise stated, handouts are required reading.


Course Website:

Course Description: This course will provide an introduction to nanoscale materials and the novel experimental and computational techniques used to measure their structure. Fabrication and characterization will be the main focus in this course, but material properties will also be discussed. Topics to be covered include materials synthesis techniques, thin film deposition, nanoparticle and nanowire growth, characterization with electrons and X-rays, forces and surface interactions at the nanoscale, structure-property scaling laws, and atomistic/multiscale computer modeling.

Prerequisites: Undergraduate level physics, chemistry, and materials science.

Grading Criteria:
In-Class Participation: 20%
Review Assignments: 30%
In-Class Presentation: 20%
Final Project: 30%

Assignments
Since this is a graduate course, we will move away from the traditional homework/exam paradigm towards assignments that will be more in line with the important tasks of graduate study and research. No matter what you choose as a career path, graduate school trains you to be a leader in your field. I would like to help prepare you to think independently and generate new knowledge.

We will end each class with a recent paper which extends the topics we discussed in lecture. You are expected to read this paper and participate in the discussion during the next class period.

There will be one review assignment, where you will be given a recent journal article and asked to write a 1-2 page review and critique of the work. You will need to identify the key ideas of the study, the limitations of the techniques used, and the future implications of the research.
Each student will give an in-class presentation, where they will provide an overview of the assigned journal article that compliments the previous lecture topic. This will be a PowerPoint-style presentation of ~10 minutes and should include ideas and visuals that stimulate discussion.

The final project for this course will be a 2 page document call a “white paper,” where you will outline an idea you have for a future research program that will address a current issue relating to nanomaterials and their properties.

**Academic Honesty**

In this class, student discussions regarding the homework are encouraged. However, the work submitted for grading must be the individual work of the student. Cheating or plagiarism will not be tolerated in any fashion, and will result in an automatic failing grade.
ENGRMAE 229P Nanoscale Materials for Modern Electronics

Lecturer: Professor Yoonjin Won won@uci.edu

Lecture Topics: 1. Thermal Issues in Modern Electronics
2. Introduction to Nanomaterials
3. Design of Nanomaterials
4. Nanomaterials Synthesis
5. Thermal Transport in Materials Systems
6. Liquid Transport in Materials Systems
7. Improvements in Phase Change Heat Transfer Physics
8. Mechanical Properties in Materials Systems

Motivation: Thermal management is one of the major bottlenecks to increasing the performance of modern electronic devices ranging from ever-shrinking transistors to portable devices, and servers. Many of these bottlenecks can be addressed through the design of new nanomaterials that exhibit unique combinations of thermofluidic or thermomechanical properties. The unique property sets can revolutionize the design of both microfluidic devices and new thermal interface materials. This course aims to identify and characterize the frontiers of new nanomaterials that can be used in thermal solutions for modern electronics.

Course Outcomes: Students will be able to identify and characterize new nanomaterials, understand their structural effects on thermal, fluidic, and mechanical properties, and develop solutions for emerging areas of nanotechnology and thermal engineering through team projects.

Reading: The readings consist of presentation-style handouts prepared on each topic, each of which will be distributed at the lecture at which the material is covered. I will be very appreciative of student feedback to help with revisions for the next offering of the course. This course aims to make you reasonably literate in the field of thermal transport and materials science in general, and nanoscale heat transfer in particular.

Prerequisite: ENGRMAE 120 or undergraduate level heat transfer

Grading Criteria: Homework Sets 30%
Homework Sets 30%
Midterm Exam 20%
Final Presentation 20%
Final Report 30%
ENERGY SYSTEMS SPECIALIZATION IN MAE

5 Existing Courses:

(1) MAE 217P. Generalized Thermodynamics

(2) MAE 210P. Advanced Fundamentals of Combustion

(3) MAE 212P. Engineering Electrochemistry: Fundamentals and Applications

(4) MAE 214A_P. Fuel Cell Fundamentals and Technology

(5) MAE 218P. Sustainable Energy

3 Possible New Courses:

(6) MAE 219. Solar & Renewable Energy Systems (patterned after the course we designed for undergrads – MAE 117)

(7) MAE 211. Energy Storage Systems & Technology

(8) MAE 213. Energy Efficiency Technology

3 Entrepreneurial/Communications Courses
ENGRMAE 217P GENERALIZED THERMODYNAMICS

Catalog Data:
ENGRMAE 217 Generalized Thermodynamics (Credit Units: 4) Generalized thermodynamics develops the laws of continuum thermodynamics from a set of plausible and intuitive postulates. The postulates are motivated qualitatively by a statistical description of matter and are justified by a posterior success for the resulting theory. Graduate students only. (Design units: 0)

Required Textbook:

Recommended Textbook:
None

References:
None

Coordinator:
Derek Dunn-Rankin

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
Introduction to Thermodynamics (MAE 91) and Applied Engineering Thermodynamics (MAE 115)

Lecture Topics:
None.

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component

Design Content Description

Approach:

Lectures:

Laboratory Portion:

Grading Criteria:

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Master of Engineering SSPGDP Proposal – Samueli School of Engineering – UC Irvine

Engineering Topics: 0.0 credit units
   Engineering Science: 0.0 credit units
   Engineering Design: 0.0 credit units

Prepared:
February 22, 2017

Senate Approved:
November 10, 2014

Approved Effective:
2015 Fall Qtr
ENGRMAE 210P ADVANCED FUNDAMENTALS OF COMBUSTION

Catalog Data:
ENGRMAE 210 Advanced Fundamentals of Combustion (Credit Units: 4) Premixed, nonpremixed, and heterogenous reactions, with emphasis on kinetics, thermal ignition, turbulent flame propagation, detonations, explosions, flammability limits, diffusion flame, quenching, flame stabilization, and particle and spray combustion. Not offered every year. Prerequisite: MAE224 or MAE230B. Graduate students only. (Design units: 0)

Required Textbook:

Recommended Textbook:
None

References:
None

Coordinator:
Derek Dunn-Rankin

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
None.

Lecture Topics:
None.

Class Schedule:
Meets for 3 hours of lecture and 1 hour of discussion each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component

Design Content Description

Approach:

Lectures:

Laboratory Portion:

Grading Criteria:

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  Engineering Science: 0.0 credit units
  Engineering Design: 0.0 credit units

Prepared:
February 22, 2017

Senate Approved:
April 29, 2013

Approved Effective:
2013 Fall Qtr
ENGRMAE 212P ENGINEERING ELECTROCHEMISTRY: FUNDAMENTALS & APPLICATIONS

Catalog Data:
ENGRMAE 212 Engineering Electrochemistry: Fundamentals & Applications (Credit Units: 4) Introduction to engineering electrochemistry fundamentals and applications. Examine thermodynamics and transport principles in typical electrochemical systems. Electrochemical sensors, batteries, fuel cells, and supercapacitors. Manufacturing aspects will also be covered. Graduate students only. (Design units: 0)

Required Textbook:

Recommended Textbook:
None

References:
none.

Coordinator:
Marc J. Madou

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
Introduction to Thermodynamics (MAE 91)

Lecture Topics:

- I. Thermodynamics of Electromotive Force (Class 1-2)
- II. Transport in Electrochemistry (Class 3-4):
  - Diffusion
  - Convection
  - Migration
  - Mixing in Low-Reynolds Number Fluids
- III. Potentiometric and Amperometric Sensor (Class 5-6)
- IV. Thermodynamics of Electrolytic and Galvanic Systems-
  - Electrolytic: Electrolysis, charging of battery
  - Galvanic: Batteries and fuel cells (Class 7)
- V. Corrosion: Pourbaix and Evans Diagrams (Class 8-9) MIDTERM (Class 10)
- VI. Batteriesandsupercapacitors(Class11-13)
- VII. Liquid Junction Solar Cells (Class 14-15)
- VIII. Fuel Cells (Class 16)
IX. Electrochemistry in Manufacturing:
   a. Additive
   b. Subtractive (Class 17-18)

X. Electrochemistry in Nanotechnology (Class 19-20)

Class Schedule:
Meets for 3 hours of lecture and 1 hour of discussion each week for 10 weeks.

Computer Usage:
Data analysis (Excel, Matlab, Mathcad), and report writing (Word, LaTeX).

Laboratory Projects:
none.

Professional Component
Contributes toward the Mechanical Engineering Topics courses.

Design Content Description

Approach:
Approach: 0%
Lectures: 100%
Laboratory Portion: 0%

Lectures:
Laboratory Portion:

Grading Criteria:

- HW: 30%
- Midterm: 30%
- Final: 40%
- Total: 100%

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 4.0 credit units
   Engineering Science: 4.0 credit units
   Engineering Design: 0.0 credit units

Prepared:
February 22, 2017

Senate Approved:
November 10, 2014

Approved Effective:
2015 Fall Qtr
ENGRMAE 214A_P FUEL CELL FUNDAMENTALS AND TECHNOLOGY
(Not required for any major.)

Catalog Data:
ENGRMAE 214A Fuel Cell Fundamentals and Technology (Credit Units: 4) Introduction to electrochemistry and electroanalysis; nature of fuel-cell electrodes and electrolytes; charge transfer reactions at interfaces; charge transport and mass transport processes; fuel processing reactions; determination of fuel cell efficiency, fuel flexibility, emissions and other characteristics. Graduate students only. (Design units: 0)

Required Textbook:
None

Recommended Textbook:
None

References:

Coordinator:
Jacob Brouwer

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic

Lecture Topics:

- Introduction to fuel cells' energy and environment
- Thermodynamic Principles
- Fuel Cell Electrochemistry
- Electro-catalysis
- Electrode Materials and Transport
- Electrolytes and Transport
- Fundamentals of Component Operation
- Fuel and Fuel Processing

Class Schedule:
Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage:
Data analysis (Excel, Matlab), and report writing (Word, LaTeX).

Laboratory Projects:

Professional Component
Contributes toward the Mechanical Engineering Topics courses.

Design Content Description
Approach:
Lectures:
Laboratory Portion:

Grading Criteria:

- HW: 30%
- Midterm: 35%
- Final: 35%
- Total: 100%

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  - Engineering Science: 0.0 credit units
  - Engineering Design: 0.0 credit units

Prepared:
February 22, 2017

Senate Approved:
March 25, 2014

Approved Effective:
2014 Fall Qtr
ENGRMAE 218P SUSTAINABLE ENERGY SYSTEMS

Catalog Data:
ENGRMAE 218 Sustainable Energy Systems (Credit Units: 4) Basic principles, design, and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal, and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation. Graduate students only. Concurrent with ENGRMAE 118. (Design units: 0)

Required Textbook:

Recommended Textbook:
None

References:
None

Coordinator:
G. Scott Samuelsen

Relationship to Student Outcomes
No student outcomes specified.

Course Learning Outcomes. Students will:

Prerequisites by Topic
None.

Lecture Topics:
None.

Class Schedule:
Meets for each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component

Design Content Description

Approach:

Lectures:

Laboratory Portion:

Grading Criteria:

Estimated ABET Category Content:
Mathematics and Basic Science: 0.0 credit units
Master of Engineering SSPGDP Proposal – Samueli School of Engineering – UC Irvine

Computing: 0.0 credit units
Engineering Topics: 0.0 credit units
  Engineering Science: 0.0 credit units
  Engineering Design: 0.0 credit units

Prepared:
February 22, 2017

Senate Approved:
May 9, 2014

Approved Effective:
2014 Fall Qtr
ENGRMAE 219P SOLAR AND RENEWABLE ENERGY SYSTEMS

Catalog Data:
**ENGRMAE 219P Solar and Renewable Energy Systems (Credit Units: 4)** Basic principles, design, and operation of solar and other renewable energy systems including solar photo-voltaic, solar thermal, wind, and PEM fuel cell. Includes power generation and storage, and renewable fuels for transportation and stationary power generation.

**Required Textbook:**

**Recommended Textbook:**
None

**References:**

**Coordinator:**
G. Scott Samuelsen

**Prerequisites by Topic**
Applied Engineering Thermodynamics

**Lecture Topics:**
- Introduction to Renewable Energy
- Energy and Environmental Impacts
- Fundamental Operating Principles
- Limiting Thermodynamics and System Losses
- Solar Photo-voltaic Cells
- Other Solar Energy Systems
- Hydro-electric Power Generation
- Wind Energy
- Biomass Fuels and Combustion
- Biomass Combustion
- Renewable Fuels for Transportation Applications
- Hybrid Renewable Systems
- Other Renewable Energy and Power Technologies

**Class Schedule:**
Meets for 3 hours of lecture each week for 10 weeks.

**Computer Usage:**
Laboratory Projects:

Professional Component
The course addresses contemporary energy requirements including the growing demand for renewable and reliable power generation, and environmentally sensitive installations. Various thermodynamic and analytical skills are required for the assessment of performance and the optimization of design. The required design project establishes team interaction and the need to combine a variety of analytical tools to develop, assess, and optimize the design within the stated scope of work and economic constraints.

Design Content Description

Approach:
Students are asked to undertake a quarter long exercise that encompasses the application of the fundamental understanding of renewable energy technologies to the design and analyses of system operation. A major focus of the problem sets is the application of fundamental engineering principles and analyses tools to the design and analysis of solar and renewable energy systems. Instruction includes key design principles, design strategies, and life cycle impacts of designs, applications and operating envelope.

Lectures: 100%
Laboratory Portion: 0%

Grading Criteria:

- Problem Sets: 25%
- Midterm Exam 1: 35%
- Midterm Exam 2: 40%
- Total: 100%

Prepared:
February 22, 2017
Appendix 7: Catalogue Announcement
Master of Engineering Program

949-824 -8104
Fadi J. Kurdahi, Director

The Master of Engineering Program is administered by faculty of the Henry Samueli School of Engineering. The program offers the Masters of Engineering degree in multiple concentrations and specializations.

The curriculum includes foundational courses that vary by specialization as well as an Entrepreneurial/Intrapreneurial sequence of courses that is common to all the specializations. The degree has a strong experiential learning component embodied in a capstone project supervised by faculty members. The MEng program proposed here is developed, in part, to serve the needs of domestic and international students, and working professionals among whom the leaders of their respective specializations are especially likely to come.

Admission

Potential graduate students for the MEng Program can apply via the Graduate Division’s online application and indicate on their applications their interest in the Program. Students apply directly to the concentration of their choice. Applicants are expected to hold a Bachelor’s degree in an Engineering or Computer Science Discipline. Students from other disciplines may be considered for admission if they have sufficient background in the basics of their target specialization. Applicants will be evaluated on the basis of their prior academic record and their potential for carrying out graduate level work as demonstrated in submitted application materials. These materials will include official university transcripts, letters of recommendation, GRE scores, and a Statement of Purpose where students can explain their relevant experience (academic or industry). Students with industry experience will be considered favorably, especially if their experience is relevant to the areas emphasized by their target specialization. An admissions committee composed of senate faculty members will evaluate the applicant files and make admissions decisions based on the overall file presented by the student. Overall, students will be admitted using criteria similar to those used in traditional MS degrees from relevant departments.

Master of Engineering Program
The self-supporting Master’s Degree in Engineering (MEng) consists of seven concentrations electives specific to each concentration, plus 8 units of project courses leading to a final project. In addition, a common layer of three courses in Business/communication/Leadership will be required of all the specializations.

**Required:** 3 Entrepreneurship/Intrapreneurship courses, ENG 281AP, ENG 281BP, and ENG 281CP.

**Required:** 6 technical courses. Acceptable courses are listed for each concentration/specialization.

- **EECS Concentration:** Has two specializations:
  - **Digital and Image Signal Processing:**
    - Three core courses are required: EECS 250P (Digital Signal Processing I); EECS 213P (Computer Architecture); and EECS 220P (Advanced DSP Architecture and Design)
    - Select three additional courses from the following list of electives: EECS 202P, EECS 211P, EECS 215P, EECS 217P, EECS 223P, EECS 240P, EECS 241AP, or 203AP
  - **High Speed Communication Circuits and Systems:**
    - Four core courses are required: EECS 241AP, EECS 244P, EECS 270AP and EECS 285AP
    - Select two additional courses from the following list of electives: EECS 250P, EECS 240P, EECS 241BP, EECS 270BP, EECS 270DP, EECS 280AP or EECS 280CP

- **CEE concentration:** Has two specializations:
  - **Water & Energy Nexus:** Choose six courses from the following: CEE 263P, CEE 265P, CEE 260P, CEE 264P, CEE 218P, and PP&D 139P.


- **MAE Concentration:** Has two specializations:
- **Energy Systems Specialization:** Choose six courses from the following: MAE 217P, MAE 210P, MAE 212P, MAE 214AP, MAE 218P, MAE 219P, MAE 211P, MAE 213P

- **Nanotechnology Specialization:** Choose six courses from the following: MAE 247P, MAE 252P, MAE 259P, MAE 254P, MAE 257P, and MAE 229P

**e) Capstone Course**

**Required:** Project Course (ENG 210P). (8 Units, can be taken in one or two quarters) Students are required to complete a project that deals with a specific emphasis of their concentration/specialization. The project will be mentored by a faculty member and approved by the student’s advisor and the Concentration director. A project report must be submitted in partial fulfillment of the degree requirements. The project report needs to be approved by the mentor, the student’s advisor and the director of the MEng Program.
Appendix 8: Program Summary
Description of Engineering MX Program for Five-Year Perspective

- **Campus** - UCI

- **Name and Anticipated Action** – “MX in Engineering” / Henry Samueli School of Engineering

- **Description of and Reasons for Anticipated Action** - The aim of this proposal is to establish a self-supported graduate-level professionally oriented Master of Engineering program (ME) at UCI. This degree program will be administered by the Henry Samueli School of Engineering (HSSoE). The Master of Engineering program’s goal is to train students in the foundation, skills and practices of engineering in different concentrations, and to instill in students skills that go beyond purely technical education, preparing them to become leaders, whether technical managers in large companies or entrepreneurs starting their own enterprises. It is anticipated that 80 students will be admitted to the inaugural cohort in Fall 2019, increasing to 360 in subsequent years as the program becomes self-sustaining. Initially the program will offer four concentrations in Civil, Mechanical, Electrical and Biomedical Engineering. Later, more concentrations can be added as the need arises. The program will be funded through tuition assessment. A market study has concluded that a tuition level of $42,000 is appropriate. The program will become self-sustaining in its second year of operation. A seed loan will be sought from campus to fund the degree establishment expenses and will be paid back once the program becomes self-sufficient. The program’s normative length is expected to be 3-4 quarters.

- **Relationship to Existing Camps Programs, Units, and Mission** - On the UCI campus, the MS programs in the Henry Samueli School of Engineering offer post graduate training geared primarily towards future researchers in different engineering disciplines. The Master of Engineering program is focused on preparing graduates for employment in industries such as electronics, aerospace, automotive, biomedical, manufacturing, robotics, security, defense, and construction. Rather than having a research focus, the ME program will require students to acquire integrative knowledge of systems, as well as hands-on knowledge and experience in an applied domain through a capstone project. Additionally, the program will feature entrepreneurship and leadership training for its students that sharpens their workplace skills and provides basic knowledge of product conception, development and launch. The program will be primarily technical in focus and these courses are expected to comprise 25-33% of the curriculum units. By comparison, the existing MS in Engineering Management program (jointly managed by HSSoE and Merage School of Business Management) has a higher ratio of business related courses (50%) and is geared towards grooming students to become business managers with some level of technical knowhow.

- **Resources** - One third of the program revenue will be used to fund up to 18 regular ladder rank faculty FTE when it reaches its target of 360 students. Additionally, existing faculty will be compensated for: (1) teaching courses in this program either as buyout or stipend, (2) supervising students in project and case studies courses and (3) administrative duties related to the program. In addition, 4-6 full time lecturers will be hired to help teach some of the courses in this program (mainly
entrepreneurship/leadership courses.) Staff support will be provided by the HSSoE staff and additional program staff hires (up to 6 staff FTE) funded from the tuition revenue. The program staff will provide day-to-day operational and administrative support including that for admissions, fellowships, appointments and general student affairs. The staff will also assist with the development of promotional and advertising materials to recruit students and with providing other administrative support.

- **Funding** - The Master of Engineering program will be self-supporting. The program revenue (including school charges and surplus) is projected to be about $10M/year.

- **Students** - 33% of the revenue will be set aside for 2 or 3 year PhD fellowships supporting students in HSSoE (with 1-2 additional year(s) funded by the prospective advisor). Additionally, the program anticipates hiring one teaching assistant for each course that is offered. It is estimated that up to 193-290 additional PhD students can be funded through this program. Finally 10% of revenue will be set aside for financial aid of students in the self-supporting program. Part of this aid will target URM and female students.

- **Employment Implications** - Program graduates will be able to seek employment in electronics, aerospace, automotive, biomedical, manufacturing, robotics, defense, and construction industries. Engineering disciplines are expected to remain popular for the foreseeable future with a current average job growth of 3-4% yearly region-wide and increasing into the next decade. A recent survey indicates that prospective students from CA, US, China and India would be extremely or strongly interested in applying and attending the UCI program once in place.

- **UC Campuses and Other California Institutions with Similar Offerings** - the Master of Engineering degree at UC Berkeley and the Master of Science in Engineering at UCLA are the two most similar programs to the proposed Master of Engineering at UCI. Both programs have sustained healthy growth and have student populations of about 250-350 students in each program. Prospective students surveyed in CA, US, India and China are likely to regard UCI’s program quality as comparable to other programs elsewhere.

- **Anticipated Campus Review and Implementation Dates** - We anticipate submitting a proposal to campus committees in Fall 2017. If resources are in place, we anticipate developing the program and courses during the 2018-2019 academic year. Ideally, the program should admit its first cohort in Fall 2019 for the 2019-2020 academic year.

- **UCI Contact Person** – Fadi Kurdahi
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  Irvine, CA 92697
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  Mobile: 949 400-9499
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Appendix 9: BYLAWS OF THE FACULTY OF PROFESSIONAL GRADUATE PROGRAM IN ENGINEERING

Article I. Purpose
The primary goal of the Professional Graduate Program in Engineering (henceforth referred to as “the Program”) is to administer the interdisciplinary graduate program of instruction and research leading to professional graduate degrees in Engineering in accordance with the rules of the Graduate Division of the University of California, Irvine. The Program shall be administered by the Henry Samueli School of Engineering and reports to the Dean of the School.

Article II. Membership
Membership in the Program Faculty shall be open to all UCI faculty who are actively engaged in research and education in Engineering or related areas and who shall be deemed qualified by University regulations and by vote of the Executive Committee.

Any Academic Senate faculty desiring to become a member of the Program Faculty may submit an application to the Program Director listing his/her qualifications and stating the reasons for wishing to become a member. These Applicants will be evaluated in terms of their current research interests and teaching commitments, and their potential for graduate student guidance and contribution to the Group's course offerings. The application will be acted upon by the Executive Committee.

Membership on the Program Faculty shall be reviewed annually by the Executive Committee. Program Faculty must participate in seminars, serve on graduate student committees, provide research support to graduate students, and/or teach regular courses germane to the Group’s educational activities or be subject to removal. Faculty with less active roles may be listed as Affiliated Faculty by the Executive Committee.

Article III. Administration: Director, Committees, Responsibilities and Oversight
The Program will establish a Director. The Director will be the administrator of the program and will serve a three year term.

The Executive Committee shall manage the affairs of the Program Faculty. The Committee comprises five members including the Director of the professional graduate program in Engineering (who shall serve as Chair of the Committee), the Associate Dean for Graduate and Professional Studies, and the concentration directors. Concentration directors shall be elected by the faculty members of each concentration and shall serve a two-year term. Election is by a mail ballot at least three weeks before the end of spring quarter, and newly elected directors assume their duties on July 1. Vacancies shall be filled by appointment made by the existing Committee; appointed members serve until the next election. To ensure broad participation, no more than two general members shall be from any one academic department.
The principle responsibilities of the Executive Committee are: 1) to represent the Program Faculty in official matters, both inside and outside the University; 2) to conduct administrative and clerical matters related to activities of the Program Faculty; 3) to review membership in the Program Faculty and maintain the Program Faculty's level of activity; 4) to review and modify program requirements from time to time; and 5) to make recommendations for admission to the graduate program. The principle role of the Graduate Advisor is the coordination of graduate affairs and the graduate application process, and the appointment of initial faculty advisors for students in the program. The Graduate Advisor reports to the Director of the program.

For the inaugural term, the founding group of faculties proposing the program will form the interim Executive Committee and Professor Kurdahi will serve as the interim Director. Once the degree program is officially approved, the nomination process outlined in the following section will be followed to confirm or replace the interim Director and Executive committee for the inaugural and all subsequent terms.

The nomination process of a new Director will be conducted in accordance with current Graduate Council and Academic Personnel Manual policies, APM Section 245. [http://www.ucop.edu/acadadv/acadpers/apm/apm-245.pdf](http://www.ucop.edu/acadadv/acadpers/apm/apm-245.pdf). A “Nominating Committee” should be named by the Executive Committee or current Director to solicit from the faculty and graduate students of the Program the names of nominees for Program Director. The names of the nominees indicating a willingness to serve will then be submitted to the Program's faculty and graduate students for comments. These names will then be forwarded to the Dean. All comments will remain confidential. After interviewing the nominees, the Dean will forward his or her choice to the Program. The normal tenure of a Director is three years; however, a Director may choose to serve a shorter term. Directors may be appointed to serve one or more terms thereafter.

The Graduate Committee oversees admissions, curriculum, and criteria for advancement of students, graduate advising, and financial support, among other things. The members of the Committee shall select a Graduate Advisor from their ranks to serve for a two-year term of office. The Program Chair and the Graduate Advisor positions may be combined at the discretion of the Committee.

**Article IV. Meetings**

Meetings are called by the Chair as he/she deems necessary, or at the request of the Executive Committee, or upon written notice from five or more members of the Program Faculty. There shall be at least one meeting per year. The program Director may call a special meeting of the program as she or he or the Executive Committee deems necessary or desirable. Additional meetings can be petitioned by five or more members. Meetings shall be conducted in accordance with generally accepted procedures including reading of the minutes of the previous meeting, report of the Executive Committee, unfinished business, and new business. At meetings, 50 percent of the Program Faculty membership shall constitute a quorum which will be empowered to take any action during the meetings except for changes in these by-laws. Minutes will be distributed to all Program faculty and instructors promptly after each meeting.

**Article V. Student Representatives**

Upon the recommendation of appropriate student groups, the Executive Committee may consider student representatives to sit on relevant committees as so deemed by the Committee. The student will have voting privileges
regarding issues related to the academic program. However, the student representative may not be present during any collective bargaining issue or concern regarding faculty and instructors personnel matters and, and, hence, will not have voting privileges with respect to these matters.

**Article VI. Graduate Student Advising**
The Graduate Committee will ensure that all matriculation and student advancement are done in accordance with UCI policy. As such, the Program acknowledges the Dean of Graduate Studies by the authority of the Graduate Council has final authority to approve appointments to graduate student advancement and dissertation committees. The appointments originate with the faculty and instructors mentor and student, and are submitted to the Dean via the program’s Graduate Advisor and the program Director. A fully developed Graduate Student Handbook to whom students can consult for any information or to seek a solution to academic Problems will be made available. The Graduate Advisor will serve as the program’s representative in dealing with the Dean’s Office and the Office of Graduate Studies It is expected there will be sufficient advisors to assist students in their progress towards their degree objectives.

**Article VII. Order of Business**
All meetings of the Faculty shall be governed by procedures specified in the Samueli School of Engineering’s Bylaws (http://senate.uci.edu/uci-academic-senate-manual/part-iii-appendices/#appendixIchapterV).

**Article VIII. Amendments and Suspension of Rules**
Changes in these bylaws shall be made by: (A) approval of at least two-thirds of the Program Membership, by email vote, or (B) at a meeting, (provided that notice of such proposed changes shall have been sent to the Members at least one week prior to the date of voting). Any significant amendments and revisions to the rules or bylaws will be submitted to Graduate Council for review and approval. Passage of amendments to bylaws must satisfy the Program’s quorum rules. The rules of the Faculty and instructors may be suspended by vote of the Faculty and instructors provided that not more than two voting members present an objection to such suspension. The Program Chair will always state the question as follows: “Those who object to a suspension of the rules will raise the right hand”. Both the duration and nature of the suspension will be explicitly stated before the votes are cast.
Appendix 10: Detailed 5-year budget and justification
## Self-Supporting Degree Program

### Draft Operating Budget Plan

#### Enrollment/Fee/Course Plan

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### Direct Expenses (Add line items as necessary)

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<thead>
<tr>
<th>Category</th>
<th>2018-2019 Projected (Year 0)</th>
<th>2019-2020 Projected (Year 1)</th>
<th>2020-2021 Projected (Year 2)</th>
<th>2021-2022 Projected (Year 3)</th>
<th>2022-2023 Projected (Year 4)</th>
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<th>2024-2025 Projected (Year 6)</th>
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<td><strong>Financial Analyst</strong></td>
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<td>TA &amp; Reader Expenses</td>
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<td>Line item example: instructional equipment, software, computers, other</td>
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<td>10% of expenses/year</td>
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<td>Financial Aid (10% of expenses)</td>
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<td>$819,046</td>
<td>$945,637</td>
<td>$1,108,375</td>
<td>10% of expenses/year</td>
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<td><strong>Campus-Based Fees</strong></td>
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<td>Line item examples: course development/revision; faculty governance; marketing; room rental; UCI Extension; market research seed funding payback,</td>
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<td>Advertising</td>
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<td>$50,000</td>
<td>$60,000</td>
<td>$75,000</td>
<td>$90,000</td>
<td>$105,000</td>
<td>$120,000 for our staff to promote the program through printing, web, third party promotion, etc</td>
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<td>Ex comm</td>
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<td>Contingency Funds</td>
<td>$161,425</td>
<td>$217,576</td>
<td>$271,029</td>
<td>$351,043</td>
<td>$409,703</td>
<td>$472,818</td>
<td>$554,187</td>
<td>5% of Expenses/year</td>
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<td>$30,000</td>
<td>$35,000</td>
<td>$40,000</td>
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<td>$50,000/year, 3 members initially, increasing by 1 member each year for a max of 10-12</td>
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<td><strong>Total</strong></td>
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<td>$246,425</td>
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<td>$554,703</td>
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### SELF-SUPPORTING DEGREE PROGRAM
#### DRAFT OPERATING BUDGET PLAN

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<th>2021-2022 Projected (Year 3)</th>
<th>2022-2023 Projected (Year 4)</th>
<th>2023-2024 Projected (Year 5)</th>
<th>2024-2025 Projected (Year 6)</th>
<th>2025-2026 Projected (Year 7)</th>
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<td>Indirect to School Charges paid by program to SSoE</td>
<td>$1,008,000</td>
<td>$1,557,360</td>
<td>$2,138,774</td>
<td>$2,753,672</td>
<td>$4,089,919</td>
<td>$4,814,419</td>
<td>30% of revenue. Please see proposal for disposition</td>
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<td>INDIRECT to SCHOOL</td>
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<td>$1,557,360</td>
<td>$2,138,774</td>
<td>$2,753,672</td>
<td>$4,089,919</td>
<td>$4,814,419</td>
<td>30% of revenue. Please see proposal for disposition</td>
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<td>Campus Unit Recharges/Fees</td>
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<td>Graduate Division</td>
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<td>$-22,804</td>
<td>$131,502</td>
<td>$839,689</td>
<td>$1,708,670</td>
<td>$2,158,056</td>
<td>$3,151,070</td>
<td>$4,176,697</td>
<td>$4,964,315</td>
</tr>
</tbody>
</table>

Please see proposal for how both school and department/unit will use the funds.

| Campus Loan Balance | $400,000 | $400,000 | $400,000 | $300,000 | $200,000 | $100,000 | $0 | $0 |
| Annual Loan Repayment (max 5 years) | $100,000 | $100,000 | $100,000 | $100,000 | $0 | $0 | |

3/7/18 Master of Engineering Self-Supporting Program_20180225_kg_FJK.xlsx
Appendix 13: Market Research Report
October 6, 2017

Fadi Kurdahi, Associate Dean for Graduate and Professional Studies, Henry Samueli School of Engineering
Jean Bennett, Director, Student Affairs, Henry Samueli School of Engineering
Kate Brigman, Assistant Director of Academic Affairs, Graduate Division
Gary Matkin, Dean, Division of Continuing Education

Re: Research Report for the Master of Professional Engineering Program

This memorandum presents the results of the market research study regarding a Master of Professional Engineering program, as proposed by the Henry Samueli School of Engineering. As discussed in our initial meeting and subsequent correspondence, research was conducted in an effort to determine overall demand and viability of the program, as proposed. The key objectives, as outlined in the initial proposal memo, are discussed below in further detail. This project was completed through the work of two research teams: at Campos, Inc., a primary research project to identify demand and price level tolerance among a prospective student population, and at the offices of the UCI Division of Continuing Education (DCE), an employment demand and competitive analysis. Both reports are attached hereto in their entirety.

1. Demand analysis. The market demand research illustrates strong market potential, including high purchase intent (likelihood to apply and likelihood to enroll if accepted). 76% of domestic respondents say they would be “extremely” or “very” interested in the program. Likewise, international respondents were slightly higher at 79%. Purchase intent is relatively high. Of all respondents, 63% expressed a strong interest in applying, with international respondents, especially those from India, seeing a higher percentage at 78%. Purchase intent is more than sufficient and demonstrates potential program success.

2. Pricing analysis. The proposed program pricing of $42,000 is optimal, according to survey results. California respondents were the only outliers, who saw the program cost as slightly too expensive. However, based on international and national responses, $42,000 is recommended.

3. Competitive analysis. A scan of competing programs found that there is moderate regional competition and that most programs are on-ground in their delivery. The proposed price point of $42,000 is also inline with competing program, being neither drastically above or below other program costs. Most of the institutions heavily emphasize their master programs for working professionals with a technical background whose career objectives are to increase their technical management responsibilities.

4. Employment demand. DCE utilized EMSI, a labor statistics platform to pull employment data and reports related to demand, skillsets and trends. Over a two year period, occupations in the Engineering field have seen a modest 3% growth. Ten year trends show a steady increase in the number of jobs in engineering fields, lending to the fact that there is more than sufficient demand for professionals with an Engineering background or skillset.
I hope this information is useful to you as you continue to develop your program proposal. Please contact me if there are any questions.

Sincerely,

[Signature]

Tim Keef
Director, Marketing and Communications
Division of Continuing Education
Market Research Report

Master of Engineering Professional Degree Program

University of California, Irvine Extension

October 2, 2017
Executive Summary

Summary Statement

Research findings indicate a moderate to strong market potential for UCI’s proposed Master of Engineering professional degree program at an optimal price of $41,715, slightly below the stated price of $42,000. The only caveat is respondents California: it has a lower purchase intent and the optimal price is $37,580. However, since other survey data about (a) whether the price is too expensive and (b) the program is priced similarly to competitive programs is positive, our recommendation is that the stated price of $42,000 will be acceptable.

Major Findings

1. Awareness of similar programs was higher in the US than internationally. Awareness of UCLA’s program was higher than Berkeley’s, except in China.

2. Overall, respondents rated Berkeley’s Master of Science in Engineering program higher, in terms of reputation, than UCLA’s Master of Science in Engineering program. There were differences by geography.

3. Most respondents think that a Master of Engineering Design professional degree program offered by the UC System would be of higher quality compared to competitors with which they are familiar.

4. Feedback to a concept description of a UCI Master of Engineering professional degree program was positive and many key “facts” about the program are likely to resonate with potential applicants. There are interesting differences by geography.

5. There is moderate to strong interest in a UCI Master of Engineering professional degree program. Interest varies by geography.

6. Purchase intent calculations which are based on questions pertaining to “likelihood to apply” and “likelihood to attend if accepted” indicate sufficient demand for the program. Purchase intent differs by geography.

7. Feedback from respondents indicates the optimal price point for the UCI Master of Engineering professional degree program is $41,715, below the stated price of $42,000. Price sensitivity differs little by geography. There are certain messages about the program that may make respondents more likely to pay the stated price.

8. Respondents are interested in a number of areas of specialization. In the US, the top ones are Civil, Electrical, and Environmental Engineering. Internationally, the top ones are Mechanical and Computer Engineering.

9. Overall, there is a preference for a program lasting three quarters in duration: Fall, Winter and Spring. But there are differences by geography.

10. The identified barriers to apply to a UCI Master of Engineering professional degree program do not represent significant obstacles.
Background and Methodology

Background and Objectives

The University of California, Irvine extension (UCI), is contemplating offering a Master of Engineering professional degree program. To determine if there is sufficient market demand for such a program among its target audiences, Campos Inc. (Campos) conducted an Online Market Potential Study.

The objectives of the study are as follows:

- Measure awareness and reputation of similar programs.
- Measure level of interest in the program.
- Identify key perceived benefits and barriers to purchase.
- Determine purchase intent based on a discount model.
- Determine optimal pricing based on a price sensitivity model.
- Assess reaction to a stated price of $42,000.

Methodology

Campos conducted an online survey among 104 respondents that belong to a demographically and geographically-balanced global panel of greater than 250,000 respondents who agree to periodically conduct surveys for a small incentive. The 104 respondents can be characterized as follows:

- All respondents had received a B.S. degree in Engineering in the past 15 years or expect to receive a B.S. degree in Engineering by the summer of 2019. The timing of their degree was distributed as follows:
  - Yes, I earned a B.S. degree in Engineering with the last 15 years—57
  - Yes, I will graduate with a B.S. Engineering degree by the Summer of 2019—47

- Respondents completed their BS degrees in a number of areas: Aerospace Engineering; Biomedical Engineering; Civil Engineering; Computer Engineering; Electrical Engineering; Environmental Engineering; Materials Science Engineering; Mechanical Engineering; and Nanotechnology Engineering

- The number of completed surveys met established quotas:
  - US—54 (29 California and 25 representative sample from other states)
  - International—50 (India 24, China 26).

- All respondents answered yes or maybe to the following question: Are you interested in learning more about an on-site, in-residence Master of Engineering professional degree program offered by a leading West Coast 4-year university that will provide advanced technical training in a student’s specific area of specialization?

Question to each question, segmented by geography, is provided in the Appendix (sample permitting).

The margin of error for all 104 respondents is +/- 9.6%.
Detailed Findings

1. Awareness of similar programs was higher in the US than internationally. Awareness of UCLA’s program was higher than Berkeley’s, except in China.

Approximately half of respondents aware of similar programs

Respondents were asked the following question: *Are you aware of any similar Professional Master of Engineering programs that provide advanced technical training in a student’s specific area of specialization?*

As the charts below illustrate, overall awareness was 54%.

- Awareness was higher in the US (61%) than internationally (46%)
- Awareness was higher in California (62%) than other states (60%).
- Awareness was much higher in India (67%) than China (27%)

### Awareness of Similar Programs By Geography

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>US</th>
<th>CA</th>
<th>Other States</th>
<th>International</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>54%</td>
<td>61%</td>
<td>62%</td>
<td>60%</td>
<td>46%</td>
<td>67%</td>
<td>27%</td>
</tr>
</tbody>
</table>

UCLA’s program has higher awareness than UC Berkeley’s

Overall, awareness of UCLA’s Master of Science in Engineering program (80%) was higher than awareness of Berkeley’s Master of Science in Engineering program, except in China.

- In China, awareness of Berkeley’s programs (80%) was higher than UCLA’s (43%)
Very few respondents were aware of programs offered at other schools.

2. **Overall, respondents rated Berkeley’s Master of Science in Engineering program higher, in terms of reputation, than UCLA’s Master of Science in Engineering program. There were differences by geography.**

Overall, a greater percentage of respondents said that Berkeley’s program (53%) had an “excellent” reputation compared to UCLA’s program (42%). It is noteworthy, however, that a greater percentage of respondents said UCLA’s program was either “excellent” or “very good” (89%), compared to Berkeley’s program (78%).

There were some notable differences by geography:

- US respondents rated Berkeley much higher (47% “excellent”) than UCLA (30% “excellent”).
- This was especially true among respondents from California: they were much more likely to rate Berkeley as “excellent” (55%) compared to UCLA’s program (38%)

The sample of respondents from India and China is too small to break out separately.
3. Most respondents think that a Master of Engineering Design professional degree program offered by the UC System would be of higher quality compared to competitors with which they are familiar.

Respondents were asked the following question to compare what are perceived to be competitive programs—as a group or competitive set—to a similar program that would be offered by the UC system: University of California Irvine (UCI) may soon offer a Master of Engineering professional degree program. Do you think this program offered by UCI would be of higher or lower quality compared to the program or programs you are familiar with? Their choices were:

- UC program is much better
- UC program is somewhat better
- UC and other programs about the same
- Other programs are somewhat better
- Other programs are much better

A UCI Program Would be Better than Other Programs

As chart below illustrates, more than 4 in 5 respondents (81%) believe that a UCI Master of Engineering professional degree program would be either “much better” (42%) or “somewhat better” (39%) than a competitive program in terms of quality.

- International respondents (83%) are more likely than US respondents (78%) to say that the UCI program would be of higher quality compared to programs they are familiar with.

Respondents from states other than California are more likely to believe that a UCI program would be of higher quality compared to programs they are familiar with.

- Non-California residents: 94% say UCI of higher quality (47% much higher, 47% somewhat higher).
California residents: 78% say UCI of higher quality (28% much higher, 39% somewhat higher).

The sample of respondents from India and China is too small to break out separately.

4. Feedback to a concept description of a UCI Master of Engineering professional degree program was positive and many key “facts” about the program are likely to resonate with potential applicants. There are interesting differences by geography.

Top Facts Tell a Story

Respondents were read a concept description of the program and asked the question: Which fact(s) stand out as most positive to you about this description? As the table below demonstrates, three facts stood out from the rest.

1. Student will acquire hands-on knowledge through practical projects. This was ranked first or second across all geographies. It was far the most positive fact for residents of states other than California (36%)

2. Students will enhance their technical training in their area of specialization. This was a “top” or very positive fact for all respondents except Non-California respondents. Only 16% choose it as a positive fact that stood out about the description, compared to 38% of respondents from California.

3. It is a professional program designed to meet growing need for practiced Engineers. This was a “top” or very positive fact for all respondents except California respondents. Only 17% choose it as a positive fact that stood out about the description, compared to 32% of respondents from other states.

Two other facts were viewed positively (20% or above with one exception) by respondents from all geographies.

- Programs offers multiple tracks that correspond to different areas in Engineering.
- Program offers leadership training designed to help graduates increase productivity

Ranking of Most Positive Facts by Geography

Respondents were provided with a total of 14 facts and asked to choose 3 that stood out as most positive about the description of the program. The table on the following page ranks each fact by the percentage of respondents who chose that fact as positive. The lower the number, the more positive the fact. For example, 1 corresponds to the fact chosen as positive by the largest percentage of respondents.
<table>
<thead>
<tr>
<th>Facts</th>
<th>All</th>
<th>US</th>
<th>CA</th>
<th>Rest</th>
<th>Intl.</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student will acquire hands-on knowledge through practical projects.</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Students will enhance their technical training in their area of specialization.</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>It is a professional program designed to meet growing need for practiced Engineers.</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Programs offers multiple tracks that correspond to different areas in Engineering.</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Program offers leadership training designed to help graduates increase productivity</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Experienced instructors from The Henry Samuel School of Engineering.</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Designed for early-to-mid-career professionals seeking to advance their careers.</td>
<td>7</td>
<td>12</td>
<td>11</td>
<td>11</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Designed specifically for both U.S. and international students.</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Offered by the University of California (UC Irvine).</td>
<td>9</td>
<td>8</td>
<td>14</td>
<td>4</td>
<td>9</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Few programs like this in the U.S.</td>
<td>9</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Designed for recent university Engineering graduates wishing to expand into systems.</td>
<td>9</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>10</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>9 courses over 3 quarters.</td>
<td>12</td>
<td>11</td>
<td>5</td>
<td>13</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Students complete a capstone project or additional courses.</td>
<td>13</td>
<td>13</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>UCI is considering offering a blended or online format in future.</td>
<td>14</td>
<td>14</td>
<td>11</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
</tbody>
</table>
5. There is moderate to strong interest in a UCI Master of Engineering professional degree program. Interest varies by geography.

Interest Level

Respondents were asked the following question: Based on the description above, how interested are you in the Master of Engineering professional degree program offered by UC Irvine? Results demonstrate a moderate to strong interest in the program. The term “moderate to strong” is used because although only 20% of respondents in the US are “extremely interested” in the program.

- Overall, 76% are either “extremely” (30%) or “very” (46%) interested.
- Among US respondents, 72% are either “extremely” (20%) or “very” (52%) interested.
- Among International respondents, 79% are either “extremely” (40%) or “very” (39%) interested.

Difference by Geography

As measured by “extremely” interested, interest in higher in California, than other states, and it much higher in India than China.
6. Purchase intent calculations which are based on questions pertaining to “likelihood to apply” and “likelihood to attend if accepted” indicate sufficient demand for the program. Purchase intent differs by geography.

Likely to Apply & Attend
Respondents were asked how likely they would be to apply to the Master of Engineering professional degree program, and how likely they would be to attend if accepted.

Results show that, overall, more than a large majority of respondents (63%) expressed a strong likelihood to apply to the program (“extremely likely” or “very likely”). A larger percentage (70%) expressed a strong likelihood to attend the program if accepted (“extremely likely” or “very likely”).

- Strong likelihood to apply to the program (“extremely” or “likely”) is higher among International respondents (78%) than US respondents (68%). Eighty percent of both International and US respondents said they would be “extremely” or “very” likely to attend the program if accepted. But notice the much stronger “extremely likely” numbers for International.

Difference by Geography
Likely to apply and likely to attend if accepted is higher among respondents from India than China.

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>How likely are you to apply to this program?</th>
<th>How likely are you to attend this program if accepted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CA</td>
<td>Other States</td>
</tr>
<tr>
<td>Extremely likely</td>
<td>17%</td>
<td>20%</td>
</tr>
<tr>
<td>Very Likely</td>
<td>48%</td>
<td>48%</td>
</tr>
<tr>
<td>Somewhat likely</td>
<td>24%</td>
<td>32%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Likely to Attend if Accepted: US vs. Intl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely Likely</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>All</td>
</tr>
<tr>
<td>US</td>
</tr>
<tr>
<td>International</td>
</tr>
</tbody>
</table>
Likely to Apply & Attend

Quantitative studies based on random sampling, as this study was, provide the opportunity to project findings from a sample (respondents) to a larger group (all students/professionals who share the same characteristics). Knowing perceived likelihood to apply to or attend a program allows market researchers to estimate purchase intent, based on what is called a discount model. For example, if a certain percentage of respondents say they are extremely likely to take an action (such as apply or attend if accepted), past research indicates that only a certain percentage will. The same logic applies to those who say very likely and somewhat likely. Using discount weights allows for more conservative and accurate projections based on longitudinal studies that track actual behavior based on previous intent questions.

Past research shows that a purchase intent exceeding 40 is considered sufficient and in nearly all cases a recommendation to proceed with the product or service follows. The projected purchase intent numbers for this program either slightly exceeds that or is close to this for all target audiences:

- Based on the question *How likely are you to apply to this program?* the purchase intent for the UCI Master of Engineering professional degree program is calculated at 42.9 among all respondents.
  - All US respondents: 39.4
    - California: 36.6 (Only segment below threshold)
    - Other states: 40.8
  - All International respondents: 46.1
    - India respondents: 49.9
    - China: 43.5

- Based on the question *How likely are you to attend this program if accepted?* the purchase intent for the UCI Master of Engineering professional degree program is calculated at 43.7 among all respondents.
  - All US respondents: 43.3
    - California: 42.0
    - Other states: 44.4
  - All international respondents: 44.3
    - India respondents: 48.0
    - China: 41.4
7. Feedback from respondents indicates the optimal price point for the UCI Master of Engineering professional degree program is $41,715, below the stated price of $42,000. Price sensitivity differs little by geography. There are certain messages about the program that may make respondents more likely to pay the stated price.

Determining Price Sensitivity

To determine optimal price preference, or what applicants would be willing to pay for a Master of Presentation Design program offered by UCI, Campos Inc. employed the Van Westendorp Price Sensitivity Model. It is based on the following four questions:

- At what price would you consider the Master of Engineering professional degree program offered by UCI to be so expensive that you would not consider attending there?
- At what price would you consider the Master of Engineering professional degree program offered by UCI to be priced so low that you would feel the quality couldn’t be very good?
- At what price would you consider Master of Engineering professional degree program offered by UCI as starting to be expensive but not out of the question, so you would have to give some thought to attending there?
- At what price would you consider the Master of Engineering professional degree program offered by UCI to be a bargain and/or a great buy for the money?

Calculations yielded an overall optimal price of $41,100, based on the following:

- Cost is so EXPENSIVE would not consider – $59,510
- Cost is so LOW the quality is NOT very good – $23,900
- Cost is starting to get EXPENSIVE but would still consider – $44,900
- Cost is BARGAIN/GREAT PRICE for the money – $32,860

Differences by Geography

The optimal price by geography differs.

- All US: $41,522
  - California: $37,580
  - Other states: $46,150
- All International: $40,714
  - India: $36,180
  - China: $44,317

Price Sensitivity: $42,000 Pricing

Analysis reveals that the optimal price is only 2% below the stated $42,000 cost. This is a minor difference. However, differences by geography suggest that a slightly reduced cost for potential applicants from California and India may make a difference unless UCI can effectively communicate that the program is competitively priced and/or a blended or online program may be available. A brief assessment of each sub-market follows.
California Respondents

Although the optimal price ($37,580) is lower than the stated price of $42,000, three considerations indicate that the stated price may be acceptable.

1. Only 17% say the price is “much too expensive,” with an additional 28% saying the price is “somewhat too expensive.” These are positive numbers based on past studies because a majority (55%) believe, at worst, that the price is “little too expensive.”

2. More than 3 in 5 (62%), say that knowing other similar Master degree programs are priced similarly would make them either “much more likely” (28%) or “somewhat more likely” (34%) to apply to the program.

3. Eight in ten (80%) say that if UCI offered this as a blended or online program, it would make them either “much more likely” (38%) or “somewhat more likely” (52%) to strongly consider the program.

Respondents from India

Similarly, although the optimal price ($36,810) is lower than the stated price of $42,000, the same three considerations discussed for California residents indicate that the stated price may be acceptable to India.

1. Only 21% say the price is “much too expensive,” with an additional 27% saying the price is “somewhat too expensive.” These are still positive numbers based on past studies because a majority (52%) believe, at worst, that the price is “little too expensive.”

2. More than 9 in 10 (92%), say that knowing other similar Master degree programs are priced similarly would make them either “much more likely” (50%) or “somewhat more likely” (42%) to apply to the program. This suggests that respondents from India, at least in this survey, may not be conversant with prevailing rates of similar programs.

3. Nearly all (80%) say that if UCI offered this as a blended or online program, it would make them either “much more likely” (58%) or “somewhat more likely” (38%) to strongly consider the program.

Non-California and China Respondents

The optimal price for residents outside of California ($46,150) and among respondents from China ($44,317) are higher than the stated price of $42,000. This suggests that the stated price is more than acceptable.

- Other states: Only 24% say the price is “much too expensive” (4%) or “somewhat too expensive” (20%). This is a low number. Additionally, 72% say they would be “much more likely” (28%) or “somewhat more likely” (34%) to apply to the program if they knew it was priced similarly to competitive programs.

- China: Only 31% say the price is “much too expensive” (9%) or “somewhat too expensive” (22%). Additionally, 83% say they would be “much more likely” (27%) or “somewhat more likely” (56%) to apply to the program if they knew it was priced similarly to competitive programs.
8. Respondents are interested in a number of areas of specialization. In the US, the top ones are Civil, Electrical, and Environmental Engineering. Internationally, the top ones are Mechanical and Computer Engineering.

Strong Interest in all Specialties

Respondents were provided with a list of 10 areas of specialization for the Master of Engineering professional degree program and asked, “which one are you most interested in.” As the graph demonstrates, there is strong interest across areas of specialization.

Differences by Geography

As ranked by percentage, there are some clear differences in preferences by geography.

- Interest in Civil and Electrical Engineering is high in the US, especially outside California.
- Interest in Environmental Engineering is high in the US, especially in California.
- Interest in Mechanical and Computer Engineering is high in India.
- Interest in Biomedical and Material Science Engineering is popular in China.
9. Overall, there is a preference for a program lasting three quarters in duration: Fall, Winter and Spring. But there are differences by geography.

There is a stated preference for a Fall, Winter and Spring program among US respondents without Summer classes, especially among residents of California. Among international respondents, opinion vary.

| Aerospace and Mechanical Engineering | 8 | 9 | 9 | 8 | 1 | 3 | 3 |
| Nanotechnology Engineering | 9 | 8 | 7 | 8 | 7 | 8 | 3 |
| Chemical Engineering | 10 | 9 | 10 | 8 | 10 | 10 | 9 |

Which best describes your preference regarding the length of the program?

- **Total**: 38% 3 quarters, 21% 2 quarters + summer, 30% 4 quarters, 11% Makes no difference
- **US**: 44% 3 quarters, 17% 2 quarters + summer, 26% 4 quarters, 13% Makes no difference
- **CA**: 52% 3 quarters, 14% 2 quarters + summer, 24% 4 quarters, 10% Makes no difference
- **Other States**: 36% 3 quarters, 20% 2 quarters + summer, 28% 4 quarters, 16% Makes no difference
- **International**: 32% 3 quarters, 26% 2 quarters + summer, 34% 4 quarters, 8% Makes no difference
- **India**: 29% 3 quarters, 25% 2 quarters + summer, 38% 4 quarters, 8% Makes no difference
- **China**: 35% 3 quarters, 27% 2 quarters + summer, 31% 4 quarters, 8% Makes no difference

1 The choices were: 3 quarters (Fall, Winter, Spring); 2 quarters plus the summer (Fall, Winter, Spring + Summer); 4 quarters (Fall, Winter, Spring + next Fall); and Makes no difference.
10. The identified barriers to apply to a UCI Master of Engineering professional degree program do not represent significant obstacles.

Positive Barrier Profile

Overall, “requires residence on campus” (37%) was most often cited as a “major” barrier to applying to the program, followed by “price or cost” (32%). These percentages are low for major barriers, compared to other programs, and this suggests an overall very positive barrier profile (meaning that major barriers would not stand in the way of applying).

- It is worth noting that 48% of resident of other states identified “requires residence on campus,” which was higher than India (40%) and China (38%). This is important because we also know that 86% of respondents said they would be more likely to apply if it was blended or online program.
## APPENDIX

### AWARENESS

**Are you aware of any similar Professional Master of Engineering programs that provide advanced technical training in a student’s specific area of specialization?**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>All US</th>
<th>CA</th>
<th>Rest</th>
<th>All Intl.</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>54</td>
<td>61</td>
<td>62</td>
<td>60</td>
<td>46</td>
<td>67</td>
<td>27</td>
</tr>
<tr>
<td>No</td>
<td>46</td>
<td>39</td>
<td>38</td>
<td>40</td>
<td>54</td>
<td>33</td>
<td>73</td>
</tr>
</tbody>
</table>

**Which of the following programs have you heard of?**

<table>
<thead>
<tr>
<th>Program</th>
<th>Total</th>
<th>All US</th>
<th>CA</th>
<th>Rest</th>
<th>All Intl.</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCLA – Master of Science in Engineering</td>
<td>80</td>
<td>82</td>
<td>89</td>
<td>73</td>
<td>78</td>
<td>94</td>
<td>43</td>
</tr>
<tr>
<td>UC Berkeley – Master of Science in Engineering</td>
<td>66</td>
<td>52</td>
<td>61</td>
<td>40</td>
<td>74</td>
<td>63</td>
<td>80</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>9</td>
<td>6</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### PERCEIVED REPUTATION

**How would you rate the overall reputation of the program offered at UCLA?**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Total</th>
<th>All US</th>
<th>CA</th>
<th>Rest</th>
<th>All Intl.</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>42</td>
<td>30</td>
<td>38</td>
<td>18</td>
<td>61</td>
<td>67</td>
<td>*</td>
</tr>
<tr>
<td>Very good</td>
<td>47</td>
<td>56</td>
<td>44</td>
<td>73</td>
<td>33</td>
<td>33</td>
<td>*</td>
</tr>
<tr>
<td>Good</td>
<td>11</td>
<td>15</td>
<td>19</td>
<td>9</td>
<td>6</td>
<td>0</td>
<td>*</td>
</tr>
</tbody>
</table>

**How would you rate the overall reputation of the program offered at Berkeley?**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Total</th>
<th>All US</th>
<th>CA</th>
<th>Rest</th>
<th>All Intl.</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>53</td>
<td>47</td>
<td>55</td>
<td>33</td>
<td>59</td>
<td>90</td>
<td>*</td>
</tr>
<tr>
<td>Very good</td>
<td>24</td>
<td>35</td>
<td>36</td>
<td>32</td>
<td>12</td>
<td>10</td>
<td>*</td>
</tr>
<tr>
<td>Good</td>
<td>23</td>
<td>18</td>
<td>9</td>
<td>34</td>
<td>29</td>
<td>0</td>
<td>*</td>
</tr>
</tbody>
</table>

**University of California Irvine (UCI) may soon offer a Master of Engineering professional degree program. Do you think this program offered by UCI would be of higher or lower quality compared to the program or programs you are familiar with?**

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Total</th>
<th>All US</th>
<th>CA</th>
<th>Rest</th>
<th>All Intl.</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCI much higher quality</td>
<td>42</td>
<td>36</td>
<td>28</td>
<td>47</td>
<td>48</td>
<td>63</td>
<td>*</td>
</tr>
<tr>
<td>UCI somewhat higher quality</td>
<td>39</td>
<td>42</td>
<td>39</td>
<td>47</td>
<td>35</td>
<td>31</td>
<td>*</td>
</tr>
<tr>
<td>UCI/other programs about the same</td>
<td>9</td>
<td>9</td>
<td>11</td>
<td>7</td>
<td>9</td>
<td>6</td>
<td>*</td>
</tr>
<tr>
<td>Other programs somewhat higher quality</td>
<td>7</td>
<td>6</td>
<td>11</td>
<td>0</td>
<td>9</td>
<td>0</td>
<td>*</td>
</tr>
</tbody>
</table>
Master of Engineering SSPGDP Proposal – Samueli School of Engineering – UC Irvine

| Other programs much higher quality | 3 | 6 | 11 | 0 | 0 | 0 | 0 | * |

**REACTION TO CONCEPT**

*Please read the description of a new Master of Engineering professional degree program below. You will then be asked a series of questions about it.*

The University of California, Irvine (UCI) seeks to establish an on-site Master of Engineering professional degree program designed for early to mid-career professionals seeking to advance their careers and recent university Engineering graduates wishing to expand their expertise into systems. The program will offer multiple tracks that correspond to different areas in Engineering, including civil and environmental, computer, electrical, mechanical and aerospace, chemical, and biomedical.

This professional program, designed to meet the fast-growing demand for graduates of Engineering programs in the U.S. and internationally, is unique in several ways. Graduates will enhance their technical training in their area of specialization, acquiring hands-on knowledge through practical projects in a targeted application domain. It also offers leadership training designed to help students and professional be more productive in the workplace and in their careers. Advanced training in specialties will better position graduates for high-earning, career-oriented jobs. There are few other programs like this in the U.S.

The program will encompass nine courses offered over three quarters taught by experienced faculty in The Henry Samueli School of Engineering. Students will have the choice of completing a capstone project or additional courses. Although all courses will require a residential component, UCI is considering offering a blended or online format in the future.

<table>
<thead>
<tr>
<th>Which fact(s) stand out as most positive to you about this description?</th>
<th>Total %</th>
<th>All US %</th>
<th>CA %</th>
<th>Rest %</th>
<th>All Intl. %</th>
<th>India %</th>
<th>China %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student will acquire hands-on knowledge through practical projects.</td>
<td>34</td>
<td>33</td>
<td>31</td>
<td>36</td>
<td>34</td>
<td>33</td>
<td>35</td>
</tr>
<tr>
<td>Students will enhance their technical training in their area of specialization.</td>
<td>30</td>
<td>28</td>
<td>38</td>
<td>16</td>
<td>32</td>
<td>33</td>
<td>31</td>
</tr>
<tr>
<td>It is a professional program designed to meet growing need for practiced Engineers.</td>
<td>30</td>
<td>24</td>
<td>17</td>
<td>32</td>
<td>36</td>
<td>50</td>
<td>23</td>
</tr>
<tr>
<td>Programs offers multiple tracks that correspond to different areas in Engineering.</td>
<td>25</td>
<td>26</td>
<td>28</td>
<td>24</td>
<td>24</td>
<td>17</td>
<td>31</td>
</tr>
<tr>
<td>Program offers leadership training designed to help graduates increase productivity</td>
<td>24</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>20</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Experience instructors from The Henry Samueli School of Engineering.</td>
<td>19</td>
<td>13</td>
<td>10</td>
<td>16</td>
<td>26</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td>Designed for early to mid-career professionals seeking to advance their careers.</td>
<td>16</td>
<td>13</td>
<td>10</td>
<td>16</td>
<td>20</td>
<td>13</td>
<td>27</td>
</tr>
<tr>
<td>Designed specifically for both U.S. and international</td>
<td>16</td>
<td>9</td>
<td>7</td>
<td>12</td>
<td>24</td>
<td>21</td>
<td>27</td>
</tr>
<tr>
<td>Offered by the University of California (UC Irvine).</td>
<td>15</td>
<td>19</td>
<td>17</td>
<td>20</td>
<td>12</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Few programs like this in the U.S.</td>
<td>15</td>
<td>19</td>
<td>17</td>
<td>20</td>
<td>12</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Designed for recent university Engineering graduates wishing to expand into systems.</td>
<td>15</td>
<td>13</td>
<td>3</td>
<td>24</td>
<td>18</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>9 courses over 3 quarters.</td>
<td>12</td>
<td>11</td>
<td>17</td>
<td>4</td>
<td>12</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Students complete a capstone project or additional</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>
UCI is considering offering a blended or online format in future.
INTEREST LEVEL

Based on the description above, how interested are you in the Master of Engineering professional degree program offered by UC Irvine?

<table>
<thead>
<tr>
<th>Interest Level</th>
<th>Total %</th>
<th>All US %</th>
<th>CA %</th>
<th>Rest %</th>
<th>All Intl. %</th>
<th>India %</th>
<th>China %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely interested</td>
<td>30</td>
<td>20</td>
<td>24</td>
<td>16</td>
<td>40</td>
<td>54</td>
<td>28</td>
</tr>
<tr>
<td>Very interested</td>
<td>46</td>
<td>52</td>
<td>48</td>
<td>56</td>
<td>39</td>
<td>33</td>
<td>46</td>
</tr>
<tr>
<td>Somewhat interested</td>
<td>22</td>
<td>24</td>
<td>21</td>
<td>28</td>
<td>21</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Not very/not at all interested</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

PURCHASE INTENT

Based on the description above, how likely are you to apply to this program?

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Total %</th>
<th>All US %</th>
<th>CA %</th>
<th>Rest %</th>
<th>All Intl. %</th>
<th>India %</th>
<th>China %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely likely</td>
<td>31</td>
<td>19</td>
<td>17</td>
<td>20</td>
<td>43</td>
<td>58</td>
<td>30</td>
</tr>
<tr>
<td>Very likely</td>
<td>42</td>
<td>49</td>
<td>48</td>
<td>48</td>
<td>35</td>
<td>25</td>
<td>45</td>
</tr>
<tr>
<td>Somewhat likely</td>
<td>25</td>
<td>28</td>
<td>24</td>
<td>32</td>
<td>21</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>Not very/not at all likely</td>
<td>2</td>
<td>4</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Purchase Intent**

|          | 42.9 | 39.4 | 36.6 | 40.8 | 46.1 | 49.9 | 43.5 |

Based on the description above, how likely are you to attend this program if accepted?

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Total %</th>
<th>All US %</th>
<th>CA %</th>
<th>Rest %</th>
<th>All Intl. %</th>
<th>India %</th>
<th>China %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely likely</td>
<td>33</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>39</td>
<td>54</td>
<td>26</td>
</tr>
<tr>
<td>Very likely</td>
<td>47</td>
<td>52</td>
<td>45</td>
<td>60</td>
<td>41</td>
<td>33</td>
<td>48</td>
</tr>
<tr>
<td>Somewhat likely</td>
<td>17</td>
<td>19</td>
<td>24</td>
<td>12</td>
<td>15</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>Not very likely</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

**Purchase Intent**

|          | 43.7 | 43.3 | 42.0 | 44.4 | 44.3 | 48.0 | 41.4 |

PRICE SENSITIVITY

To determine the optimal price, respondents were asked 4 questions:

- At what price would you consider tuition for the Master of Engineering professional degree program offered by UCI to be so expensive that you would not consider attending there?
- At what price would you consider total tuition for the Master of Engineering professional degree program offered by UCI to be priced so low that you would feel the quality couldn't be very good?
- At what price would you consider total tuition for the Master of Engineering professional degree program offered by UCI as starting to expensive but not out of the question, so you would have to give some thought to attending there?
At what price would you consider total tuition for the Master of Engineering professional degree program offered by UCI to be a bargain and/or a great buy for the money?

<table>
<thead>
<tr>
<th>Questions</th>
<th>Total %</th>
<th>All US %</th>
<th>CA %</th>
<th>Rest %</th>
<th>All Intl. %</th>
<th>India %</th>
<th>China %</th>
</tr>
</thead>
<tbody>
<tr>
<td>So expensive you would not consider attending there</td>
<td>$59,510</td>
<td>$56,063</td>
<td>$48,950</td>
<td>$64,414</td>
<td>$63,245</td>
<td>$55,000</td>
<td>$70,855</td>
</tr>
<tr>
<td>So low that you would feel the quality wouldn’t be very good</td>
<td>$23,900</td>
<td>$22,908</td>
<td>$21,100</td>
<td>$25,030</td>
<td>$24,988</td>
<td>$22,700</td>
<td>$27,100</td>
</tr>
<tr>
<td>Starting to get expensive</td>
<td>$44,900</td>
<td>$44,888</td>
<td>$41,300</td>
<td>$49,100</td>
<td>$44,956</td>
<td>$40,900</td>
<td>$48,700</td>
</tr>
<tr>
<td>Bargain/great value for the money</td>
<td>$32,860</td>
<td>$32,194</td>
<td>$26,600</td>
<td>$38,760</td>
<td>$33,583</td>
<td>$29,990</td>
<td>$36,900</td>
</tr>
<tr>
<td>Optimal Price</td>
<td>$41,100</td>
<td>$41,522</td>
<td>$37,580</td>
<td>$46,150</td>
<td>$40,714</td>
<td>$36,810</td>
<td>$44,317</td>
</tr>
</tbody>
</table>

Based on the description above, would you consider a total tuition cost of $42,000 for the Master of Applied Physics program offered by University of California, Irvine to be....?

<table>
<thead>
<tr>
<th>Questions</th>
<th>Total %</th>
<th>All US %</th>
<th>CA %</th>
<th>Rest %</th>
<th>All Intl. %</th>
<th>India %</th>
<th>China %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much too expensive</td>
<td>13</td>
<td>11</td>
<td>17</td>
<td>4</td>
<td>15</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td>Somewhat too expensive</td>
<td>24</td>
<td>24</td>
<td>28</td>
<td>20</td>
<td>24</td>
<td>27</td>
<td>22</td>
</tr>
<tr>
<td>A little too expensive</td>
<td>28</td>
<td>30</td>
<td>34</td>
<td>24</td>
<td>26</td>
<td>25</td>
<td>27</td>
</tr>
<tr>
<td>About right</td>
<td>20</td>
<td>22</td>
<td>10</td>
<td>36</td>
<td>19</td>
<td>14</td>
<td>23</td>
</tr>
<tr>
<td>Not very expensive</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>12</td>
<td>12</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Not at all expensive</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

Would knowing that other similar Master degree programs are priced similarly make you more or less likely to apply to the UCI program?

<table>
<thead>
<tr>
<th>Questions</th>
<th>Total %</th>
<th>All US %</th>
<th>CA %</th>
<th>Rest %</th>
<th>All Intl. %</th>
<th>India %</th>
<th>China %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much more likely to consider UCI</td>
<td>29</td>
<td>20</td>
<td>28</td>
<td>22</td>
<td>38</td>
<td>50</td>
<td>27</td>
</tr>
<tr>
<td>Somewhat more likely to consider UCI</td>
<td>51</td>
<td>52</td>
<td>34</td>
<td>52</td>
<td>49</td>
<td>42</td>
<td>56</td>
</tr>
<tr>
<td>Somewhat less likely to consider UCI</td>
<td>14</td>
<td>19</td>
<td>24</td>
<td>18</td>
<td>10</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>Much less likely to consider UCI</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Makes no difference</td>
<td>5</td>
<td>7</td>
<td>11</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

If UCI was to offer this as a blended or online program, would this make you more or less likely to strongly consider the program?

<table>
<thead>
<tr>
<th>Questions</th>
<th>Total %</th>
<th>All US %</th>
<th>CA %</th>
<th>Rest %</th>
<th>All Intl. %</th>
<th>India %</th>
<th>China %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much more likely</td>
<td>36</td>
<td>30</td>
<td>38</td>
<td>20</td>
<td>43</td>
<td>58</td>
<td>30</td>
</tr>
<tr>
<td>Somewhat more likely</td>
<td>50</td>
<td>59</td>
<td>52</td>
<td>68</td>
<td>41</td>
<td>38</td>
<td>44</td>
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<tr>
<td>No difference</td>
<td>12</td>
<td>9</td>
<td>7</td>
<td>12</td>
<td>15</td>
<td>4</td>
<td>26</td>
</tr>
<tr>
<td>Somewhat less likely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Much less likely</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
## AREAS OF SPECIALIZATION

Listed below are possible areas of specialization for the Master of Engineering professional program. Which one area are you most interested in?

<table>
<thead>
<tr>
<th>Area of Specialization</th>
<th>Total</th>
<th>All US</th>
<th>CA</th>
<th>Rest</th>
<th>All Intl.</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineering</td>
<td>14</td>
<td>20</td>
<td>13</td>
<td>24</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>13</td>
<td>13</td>
<td>7</td>
<td>20</td>
<td>13</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>Environmental Engineering</td>
<td>12</td>
<td>20</td>
<td>22</td>
<td>12</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>12</td>
<td>11</td>
<td>12</td>
<td>8</td>
<td>13</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>12</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td>14</td>
<td>18</td>
<td>11</td>
</tr>
<tr>
<td>Biomedical Engineering</td>
<td>11</td>
<td>10</td>
<td>13</td>
<td>9</td>
<td>12</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Materials Science Engineering</td>
<td>9</td>
<td>7</td>
<td>14</td>
<td>7</td>
<td>11</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Aerospace and Mechanical Engineering</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>14</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Nanotechnology Engineering</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>4</td>
<td>9</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

## CONSIDERATIONS

Which one of the following best describes your preference regarding the length of the program?

<table>
<thead>
<tr>
<th>Preference</th>
<th>Total</th>
<th>All US</th>
<th>CA</th>
<th>Rest</th>
<th>All Intl.</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 quarters (Fall, Winter, Spring)</td>
<td>38</td>
<td>44</td>
<td>52</td>
<td>36</td>
<td>32</td>
<td>29</td>
<td>35</td>
</tr>
<tr>
<td>2 quarters plus the summer (Fall, Winter, Spring + Summer)</td>
<td>21</td>
<td>17</td>
<td>14</td>
<td>20</td>
<td>26</td>
<td>25</td>
<td>27</td>
</tr>
<tr>
<td>4 quarters (Fall, Winter, Spring + next Fall)</td>
<td>30</td>
<td>26</td>
<td>24</td>
<td>28</td>
<td>34</td>
<td>38</td>
<td>31</td>
</tr>
<tr>
<td>Makes no difference</td>
<td>11</td>
<td>13</td>
<td>10</td>
<td>16</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

## BARRIERS

How much of a barrier is each of the following to you in terms of considering applying to the Master of Engineering professional degree program offered by UCI?

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Total</th>
<th>All US</th>
<th>CA</th>
<th>Rest</th>
<th>All Intl.</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requires residence on campus</td>
<td>37/80</td>
<td>35/74</td>
<td>24/76</td>
<td>48/72</td>
<td>39/86</td>
<td>40/87</td>
<td>38/85</td>
</tr>
<tr>
<td>Price or cost</td>
<td>32/80</td>
<td>35/74</td>
<td>38/93</td>
<td>32/80</td>
<td>29/75</td>
<td>38/80</td>
<td>19/69</td>
</tr>
<tr>
<td>UCI is in California</td>
<td>27/70</td>
<td>17/47</td>
<td>10/34</td>
<td>24/60</td>
<td>34/73</td>
<td>40/82</td>
<td>39/78</td>
</tr>
<tr>
<td>Know little about UCI</td>
<td>26/70</td>
<td>19/63</td>
<td>17/55</td>
<td>10/27</td>
<td>32/77</td>
<td>38/80</td>
<td>39/78</td>
</tr>
<tr>
<td>Preference for other programs</td>
<td>24/65</td>
<td>17/63</td>
<td>28/72</td>
<td>14/52</td>
<td>31/67</td>
<td>36/70</td>
<td>27/65</td>
</tr>
<tr>
<td>Don't have the time</td>
<td>22/61</td>
<td>13/46</td>
<td>19/42</td>
<td>12/53</td>
<td>30/76</td>
<td>29/79</td>
<td>31/73</td>
</tr>
<tr>
<td>Not interested in the career paths</td>
<td>21/68</td>
<td>22/74</td>
<td>24/72</td>
<td>20/76</td>
<td>21/62</td>
<td>12/55</td>
<td>31/73</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Don't see the value for my professional career</td>
<td>13/55</td>
<td>11/59</td>
<td>14/59</td>
<td>8/60</td>
<td>16/52</td>
<td>9/50</td>
<td>23/53</td>
</tr>
</tbody>
</table>
Program Evaluation:

Master of Professional Engineering

University of California, Irvine

Competitive and Employment Outlook

Analysis
I. Overview
II. Objective
III. Key Findings
IV. Recommendations
V. Competitive Program Analysis
VI. Competitive Program Overviews
VII. Occupation Summary for Engineers, All Other
VIII. Industry Outlook for Engineering Services
I. Overview

The Henry Samueli School of Engineering is proposing a Master of Professional Engineering, which focuses on technical and leadership/entrepreneurship skills.

The program will eventually include two options for delivery, a hybrid track that includes both on-line and on-campus coursework, and a completely on-campus track. Initially the courses will be on-campus with online versions to be developed over time. This program will consists of 36 to 40 quarter units, which corresponds to 9-10 courses. The Master of Professional Engineering will have multiple tracks corresponding to different areas in engineering.

This program targets industry professionals and students who wish to pursue career in industry, both domestic and international. The leadership/entrepreneurship training will help students become more productive in their careers.

Anticipated program cost $42k for the total tuition cost.
The Master of Professional Engineering, as proposed, would have some competition in regards to curriculum, delivery, and degree. Many different Universities have similar master programs in professional engineering.
II. Objective

The offices of UCI Division of Continuing Education undertook secondary research on competitive, or like programs in an effort to extract information related to program offerings, costs, modalities, length of studies, and distinguishing factors. Additionally, UCI Division of Continuing Education researched employment trends within the fields of engineering.

Competitive Programs were selected based on institutional prestige, as UCI is distinguishably reputable university, and similarity of offered program/curriculum. Although the Master in Professional Engineering is an uncommon offering, Institutions were selected based on the offering of a Master degree program that centered around engineering and management.

The research provides a full competitive landscape, denoting each program, degree conferred, pricing, length of study, and an outline of curriculum.
III. Key Findings

- **Moderate regional competition.** A few southern California campuses offer a similar master’s program that entails both engineering and leadership courses.
- **Delivery options mostly on-campus.** Most institutions offer their program on-campus, with only UC Los Angeles offering an online delivery.
- **Pricing in line with other programs.** The proposed program pricing of roughly $42,000 for the on-ground track is within line in comparison to the other institutions. The lower
end of the pricing spectrum is around $9,000, while the higher end of the pricing spectrum is around $93,000.

- **Similar entry requirements.** Most of the institutions heavily emphasize their master programs for working professionals with a technical background whose career objectives are to increase their technical management responsibilities.

- **Industry growth.** Occupations in the engineering field are on an upward trend. From 2013-2015 the industry has had a 3% growth rate.

- **New and growing industry trend.** Interest in the construction of environmentally friendly buildings has been growing over the past decade. Over the five-year period, improving aggregate private investment will encourage operators to invest in new structures, including those with certification from the US Green Building Council. The Leadership in Energy and Environmental Design (LEED) standards have become a widely recognizable and understandable signal for building sustainability and performance. LEED standards will continue to develop over the next five years and will include credits for the use of building materials that are sustainable. Engineering companies are expected to respond by focusing on more predesign work to achieve green solutions and benefits, such as reduced building operating costs and increased asset value.

- **Education level.** The national educational attainment for engineering professionals are 48.1% Bachelor’s degree and 28% Master’s degree.
IV. Recommendations

- **Provide a clear value proposition to students.** After conducting a competitive analysis to similar program offerings, UC Irvine’s Master in Professional Engineering is not a unique offering. Many other institutions offer a similar master program, but with a different title. Many of the similar programs offer a M.S. in Engineering Management and Leadership program. UC Irvine currently offers M.S. in Engineering Management. This degree is jointly offered by The Paul Merage School of Business and The Samueli School of Engineering that prepares engineers for leadership roles in technology, science, government, and engineering-based companies and organizations. Some questions need to be answered to see if a M.S. in Professional Engineering is necessary. For instance, is there a clear difference with the current M.S. in Engineering Management with the new proposed M.S. in Professional Engineering? Why would a student chose to take a M.S. in Professional Engineering versus a M.S in Engineering Management at UC Irvine? Should there only be a M.S. in Engineering Management, but it can offer a concentration in Professional Engineering? These questions should be further explored to prove a need for the new M.S. program.

- **Provide career outlook data.** If possible, try to provide potential students with career outlook data, including types of careers available to those who earn a M.S. in Professional Engineering and any accompanying occupational growth trends. Links to articles and engineering memberships can also prove to be a valuable resource to potential and current students.
  
Example Affiliations:

- **IEEE** - IEEE is the world’s largest technical professional organization dedicated to advancing technology for the benefit of humanity
- **NSPE** - Is the National Society of Professional Engineers, which is a growing network of like-minded professionals who share your commitment, integrity, pride, and your desire to be held to a higher standard
- **USGBC** - The U.S. Green Building Council strives to evolve LEED so that it continues to raise the bar of green building. By increasing the stringency of LEED on a regular basis, we ensure that LEED remains a leadership standard that is affecting real change. We also ensure that industry; products and innovations can keep up and step up to meet the pressing needs of today’s built environment.

- **Market desirable features of the program.** Emphasize the integrative approach that blends fundamentals, research and hands-on experience, plus explain the school’s
mission which is to unleash innovation, create opportunities and inspire ingenuity. Highlight the Samueli School’s faculty members who are leaders in their disciplines and have achieved worldwide recognition for their research and dedicated teaching. Explain the current research that is being conducted at UCI which include Communications and Information Technology, Energy and Sustainability, Human Health, and Advanced Manufacturing and Materials.

V. Competitive Program Analysis

<table>
<thead>
<tr>
<th>Institution</th>
<th>Degree</th>
<th>Total Units/ Program Length</th>
<th>Estimated Tuition (not including room &amp; board or additional fees)</th>
<th>Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santa Clara University</td>
<td>Master of Science in Engineering Management and Leadership</td>
<td>45 units</td>
<td>~$41,760 USD</td>
<td>On-campus</td>
</tr>
<tr>
<td>Cal Poly Pomona</td>
<td>Master of Science in Engineering Management</td>
<td>48 units</td>
<td>~8,700 USD</td>
<td>On-campus</td>
</tr>
<tr>
<td>University of Southern California</td>
<td>M.S. Mechanical Engineering/ M.S. Engineering Management</td>
<td>48 units</td>
<td>~$93,000 USD</td>
<td>On-campus and online</td>
</tr>
<tr>
<td>University of California, Irvine</td>
<td>M.S. Engineering Management</td>
<td>17 courses/ 1 year</td>
<td>~$41,338.50 USD</td>
<td>On-Campus</td>
</tr>
<tr>
<td>UC Berkeley</td>
<td>M.Eng. Master in Engineering</td>
<td>Minimum 24 units</td>
<td>~$47,803.50 USD</td>
<td>On-Campus</td>
</tr>
<tr>
<td>UC Los Angeles</td>
<td>M.S. Engineering with Certificate of Specialization in Engineering Management</td>
<td>36 units</td>
<td>36,000 USD</td>
<td>On-Campus and Online</td>
</tr>
</tbody>
</table>
VI. Competitive Program Overviews

Santa Clara University

*Engineering Management & Leadership*

Link: [https://www.scu.edu/engineering/academic-programs/department-of-engineering-management--leadership/academic-programs/](https://www.scu.edu/engineering/academic-programs/department-of-engineering-management--leadership/academic-programs/)

The Engineering Management and Leadership Program is specifically designed for those engineers or computer scientists who wish to reach their career goals by expanding their business acumen while also advancing their technical knowledge. Unlike an MBA, the Master of Science Program in Engineering Management and Leadership couples technical proficiency with business comprehension, providing the optimum skill set for a wide variety of management positions from technical product manager to chief technology officer. This is a program for professionals who must balance technical capability and business understanding in the development of products and processes that have a high technological content. Our program is for those professionals who want to be valued contributors in both technical and business arenas, and who wish to sustain their technical vitality while advancing their careers.
A minimum of 45 quarter units are required for the master's degree. For the Engineering Management and Leadership degree, 20 units must be completed in engineering management courses, 19 units in technical courses and 6 units in The SCU Graduate Core. Technical courses include courses in civil, computer, electrical, or mechanical engineering; or applied mathematics; or a combination of all these. Please refer to the current Graduate Bulletin for more information relating to technical courses applicable to this degree.

A maximum of 9 quarter units (6 semester units) of graduate level courses may be transferred from other accredited institutions at the discretion of the student's advisor provided they have not been applied to a previous degree. However, in no case will the minimum units taken in the Department of Engineering Management and Leadership be fewer than 16. Extension classes, continuing education classes, professional development courses, or classes from international universities are not accepted for transfer credit.

Engineering Management and Leadership candidates must submit a Program of Studies to the chair of the Engineering Management and Leadership Department during the first term of enrollment to ensure that all courses undertaken are applicable to the degree.

**Cal Poly Pomona**

*M.S. in Engineering Management*

[http://www.cpp.edu/~engineering/IME/grad.shtml](http://www.cpp.edu/~engineering/IME/grad.shtml)

The Master of Science in Engineering Management is a unique program developed to meet industry's need for highly qualified and well trained engineering managers. The program gives engineers advanced multidisciplinary training in manufacturing, production and operations management, business, and finance. It is such an interdisciplinary program to be offered by the College of Engineering in cooperation with the College of Business Administration. Most of the applicants to the program are expected to have work experience, to be working full-time, and to enroll as part-time students. The curriculum is structured so that the student can complete a course of study tailored to the student’s unique talents and career goals. It culminates in an engineering management research experience that addresses students and industry needs.
Students will be given the option of performing thesis research on individual topics or to join research teams sponsored by one of the programs’ industry partners.

A minimum of 48 quarter units of course work is needed. This should include at least 24 units of graduate business administration (GBA) courses, and a minimum of 24 quarter units of engineering graduate (EGR/EMT) courses. A maximum of 8 quarter units at the 400 level may be accepted for graduate EGR/EMT or GBA courses. The program of study includes at least 20 quarter units of core courses and 20 quarter units of technical emphasis courses. The remaining units consist of at least 6 quarter units of electives, and an Independent Study with a Report. A grade point average of 3.0 or better must be maintained. During the first quarter each student will develop a program of study approved by Graduate Studies Committee. A total of 13 quarter units of transfer, Extended University or units petitioned for graduate study, or any combination of 13 units may be included in a Master's contract. The stipulated time limit of 7 years applies to all of the above.

Curriculum:

A minimum of 48 quarter units is required for the Master of Science in Engineering Management (MSEM) program. This should include at least 24 quarter units of engineering graduate (EGR/EMT) courses and a minimum of 24 units of graduate business administration (GBA) courses.

Core: 20 units

Select 5 from the following list:

- EMT 538 - Advanced Engineering Economy (4)
- EMT 539 - Advanced Human Factors in Engineering Design (4)
- EMT 549 - Advanced Methods in Operations Research (4)
- EMT 572 - Total Quality Management in Engineering (4)
• EMT 573 - Advanced Operations Planning and Control Systems (4)
• EMT 574 - Advanced Facilities Planning (4)

Emphasis: 20 units

• GBA 510 - Financial Accounting (4) or
• GBA 608 - Accounting and Managerial Decisions (4)
• GBA 514 - Managerial Statistics (4)
• GBA 546 - Fundamentals of Financial Management (4)
• GBA 636 - Project Management (4)
• GBA 687 - Management Strategies (4)

Electives: 4-6 units minimum

Select from the following list:
• EGR 596 - Research Methods (2)
• EMT 691 - Directed Study (2)
• GBA 517 - Essentials of Marketing Management (4)
• GBA 530 - Legal Environment of Business (4)
• GBA 562 - Strategic Human Resources Management (4)
• GBA 615 - Leadership and Ethics in Organizations (4)
University of Southern California

M.S. Mechanical Engineering/ M.S. Engineering Management

https://gapp.usc.edu/graduate-programs/masters/industrial-systems-engineering/dual-degree-MSME-MSEMT

The Daniel J. Epstein Department of Industrial and Systems Engineering in conjunction with the department of Aerospace and Mechanical Engineering offers programs leading to the degree of Master of Science in Mechanical Engineering/Master of Science in Engineering Management. This program is designed for graduate mechanical engineers whose career objectives lead to increasing technical management responsibilities.

In addition to the general requirements of the Viterbi School of Engineering, the dual degree of Master of Science in Mechanical Engineering/Master of Science in Engineering Management is also subject to the following requirements:

All applicants must meet the admission requirements of both the Department of Aerospace and Mechanical Engineering and the Department of Industrial and Systems Engineering

A minimum of 48 units is required

A minimum of 18 units must be graduate level course work in AME, approved by an AME graduate student advisor

A minimum of 18 units must be graduate level course work in ISE, approved by the ISE Engineering Management graduate student advisor and chosen from the course list under Master of Science in Engineering Management

A minimum additional 12 units of acceptable course work must be chosen with the consent of the ISE Engineering Management graduate student advisor to form a coherent program.

University of California, Irvine

M.S. Engineering Management
The Master of Science in Engineering Management is a graduate degree jointly offered by The Paul Merage School of Business and The Samueli School of Engineering that will prepare engineers for leadership roles in technology, science, government, and engineering-based companies and organizations. The curriculum includes courses in engineering from The Samueli School of Engineering and courses in business administration from The Paul Merage School of Business. Students will emerge as innovators by taking on the role of business and engineering project managers tasked with solving complex engineering product development challenges through consulting projects, business plans and exposure to current issues within the engineering sector. Through this process, quantitative and qualitative skills along with business communication skills will be developed.

This program is designed to be completed in one full-time year. The M.S. degree requires the completion of designated course work which corresponds to a minimum of 17 courses beyond the bachelor’s degree. As part of the program, students must complete a two-week orientation and an intensive course in early to mid-September preceding the Fall Quarter which presents fundamental concepts of management to initiate students into the concrete challenges that managers in high performing organizations typically confront.

**MSEM Core Requirements**

Due to the interdisciplinary nature of this degree, it is important to establish a common foundation in Engineering Management for students from various backgrounds. This foundation is sufficiently covered in Engineering Management courses that are listed below and that deal with the following topics:

- Management of Innovative Organizations
- Proseminar - every quarter
- Experiential Learning
- Entrepreneurship for Scientists and Engineers
• Engineering Departmental Seminar based on Specialization

Other Requirements and Electives

Business

In addition to the core courses listed above, at least 5 additional courses from The Merage School of Business are required. (Students will be recommended certain classes based on career tracks they plan to pursue.)

3 Merage School MBA core courses

2 additional courses from a selected group of either core or elective courses:

Engineering

In addition to the core courses listed above, at least 5 additional courses from The Henry Samueli School of Engineering are required. (Students will be recommended certain classes based on their background and the career tracks they plan to pursue.)

3 courses from your approved specialization in Engineering:

• Biomedical Engineering
• Chemical and Biochemical Engineering
• Civil Engineering
• Electrical and Computer Engineering
• Materials Science and Engineering
• Mechanical and Aerospace Engineering

2 additional elective courses chosen from primary specialization, another specialization, or from courses within or outside Engineering with approval of Program Director

Specializations: Biomedical Engineering, Chemical and Biochemical Engineering, Civil Engineering, Electrical and Computer Engineering, Materials Science and Engineering, or Mechanical and Aerospace Engineering

Program Learning Outcomes

• Core Knowledge. Students will be able to demonstrate general knowledge of core topics, and theory in their focus area as necessary for professional practice.

• Ability to work on teams. Students will be able to demonstrate effective team skills.

• Professionalism. Students will be able to engage in effective professional development and to demonstrate effective and professional communication.

This competitive major teaches business from the engineering perspective and engineering from the business perspective and students will learn to think about their work through the lens of innovation and to develop a crucial view to enhance

University of California, Berkeley

M.Eng. Engineering

https://eecs.berkeley.edu/academics/graduate/industry-programs/meng

A Master's degree is an essential beginning for a long-term career in Electrical Engineering and in Computer Science. A Master's degree will allow you a deeper technical specialization, giving you both a head start in your career and a long-term advantage by making it easier for you to track new developments and change direction in your career. Berkeley's Master of Engineering program goes beyond technical specialization to offer courses in engineering leadership and a
team-oriented capstone project. The project allows you to practice, with guidance, the technical and non-technical skills that you learn in the classroom.

Our M.Eng. in EECS program offers innovative graduate courses on scientific and technical topics, organized by technical concentrations that match your interest. However, success in engineering requires skills that transcend the scientific and technical. In a modern engineering development organization, you almost always have to work in teams, and you must communicate your ideas and influence people (colleagues, investors, customers) through oral and written communication. Even as you tackle difficult technical challenges, you have to consider the match between your ideas and the needs of eventual users, how your choices give your organization a competitive advantage, and how to protect your intellectual property. Increasingly, you have to develop an idea in a multi-disciplinary environment, consider complex systems issues as well as detailed technical issues, and position yourself in an ecosystem of suppliers, and complementary products and strategic relationships. Our Masters of Engineering curriculum has anticipated all this, and prepares you for these real-world challenges.

Berkeley is one of the top EECS programs in the world. Here, you’ll learn from superb faculty, as well as an unparalleled student body. Join us for an academic year and undertake the academic experience of a lifetime. You’ll be better prepared for a satisfying and lasting career in engineering design, development, and management.

**Core Coursework in Leadership (12 units)**

**Areas of Concentration (~12 units)**

The EECS department offers concentrations in both Electrical Engineering and Computer Science. The 2017-2018 degree program offers the following concentrations. It is important to note that choosing one of these areas does not prevent you from taking courses in other areas.

New for Fall 2017:

In addition to Capstone Projects, we will also offer two Capstone Design Experiences: one in Physical Electronics & Integrated Circuits and one in Visual Computing & Computer Graphics.
The design experience is a combination of an introductory class taken in the Fall term to familiarize students with key concepts and tools, coupled with a Capstone Project in the Spring term. Students are expected to obtain multi-faceted and interdisciplinary skills as compared to some of our more specific area-aligned Capstone Project topics.

Data Science and Systems: Prepares you for engineering careers in data-centric industries requiring understanding of data management fundamentals as well as the latest technologies and techniques for the collection, storage, and analysis of information. Data Science and Systems Capstone Projects & Requirements.

Physical Electronics and Integrated Circuits: Prepares you for engineering careers in industries needing an understanding of state-of-the-art analog and digital integrated circuits including RF communication circuits, A/D converters, sensor interfaces and design techniques used in today's most advanced integrated circuits. Physical Electronics and Integrated Circuits Capstone Projects & Requirements.


Signal Processing and Communications: Prepares you for engineering careers in industries applying signal processing or communications. Markets include wireless communication, computer networking, entertainment, video processing, biomedical, etc. Signal Processing and Communications Capstone Projects & Requirements.

UC Los Angeles

M.S. Engineering Management

http://www.msol.ucla.edu/engineering-management/

Degree: Master of Science in Engineering with Certificate of Specialization in Engineering Management

The Engineering Management program focuses on providing entering and current engineering management personnel an opportunity to expand their business related knowledge base and skills to enhance employment performance to the benefit of both the employee and employer. The program offers similar curriculum to that currently offered on campus by our professional schools.* The program will have a strong on-campus component to enhance social networking, communications, and team building skills. All internet available lecturers will be offered 24/7, with a weekly home-room time to enhance the taped lectures and promote class interaction. The home-rooms will be held in early evenings to facilitate non-impact with the employees work schedule. All on-campus events will be held on Saturday mornings.

Complete all 9 courses (36 units) and meet the comprehensive requirement.

Fundamental Courses in Engineering Management

1. ENGR 200 Program Management Principles for Engineers and Professionals [Winter]
2. ENGR 201 System Engineering [Fall]
3. ENGR 210 Operations and Supply Chain Management (Spring)
4. ENGR 213 Data and Business Analytics (Winter Even Years)
5. ENGR 211 Financial Management (Summer 2016)
6. ENGR 212 Intellectual Property and Strategy (Fall ODD Years)
7. ENGR 116 Statistics for Management Decisions (Summer)
8. ENGR 214 Management Communication (Spring)
9. ENGR 217 Quality and Reliability Engineering (Fall)
VII. Occupation Summary for Engineers, All Other

Data Provided by EMSI- http://www.economicmodeling.com/

Regional Trends

<table>
<thead>
<tr>
<th>Region</th>
<th>2013 Jobs</th>
<th>2015 Jobs</th>
<th>Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region</td>
<td>109,483</td>
<td>140,639</td>
<td>4,156</td>
<td>3.0%</td>
</tr>
<tr>
<td>California</td>
<td>19,566</td>
<td>20,407</td>
<td>821</td>
<td>4.2%</td>
</tr>
<tr>
<td>Orange County, CA</td>
<td>1,756</td>
<td>1,854</td>
<td>98</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

National Educational Attainment
Program Market Demand

*Engineering/Industrial Management*

**In-Demand Skills**

**Most Relevant Hard Skills**

<table>
<thead>
<tr>
<th>Skill</th>
<th>Relevance Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plasma-Enhanced Chemical Vapor Deposition</td>
<td>1,672.21</td>
</tr>
<tr>
<td>Work Measurement</td>
<td>890.42</td>
</tr>
<tr>
<td>Manufacturing Execution System (MES)</td>
<td>274.68</td>
</tr>
<tr>
<td>Solid Modeling</td>
<td>157.04</td>
</tr>
<tr>
<td>Industrial Engineering</td>
<td>143.82</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>128.52</td>
</tr>
<tr>
<td>Technical Drawing</td>
<td>127.25</td>
</tr>
<tr>
<td>Failure Analysis</td>
<td>125.65</td>
</tr>
<tr>
<td>JMP (Statistical Software)</td>
<td>124.82</td>
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<tr>
<td>PTC Creo Elements/Pro</td>
<td>92.11</td>
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Most Relevant Soft Skills

<table>
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<tr>
<th>Skill</th>
<th>Score</th>
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<tbody>
<tr>
<td>Reliability</td>
<td>12.49</td>
</tr>
<tr>
<td>Learning</td>
<td>1.49</td>
</tr>
<tr>
<td>Scheduling/Project Management</td>
<td>0.35</td>
</tr>
<tr>
<td>Coordinating</td>
<td>0.28</td>
</tr>
<tr>
<td>Leadership</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Target Occupations

*Filtered by the proportion of the national workforce in these occupations with a Master’s degree*

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>121</td>
<td>41% below National average</td>
<td>-0.8%</td>
<td>Nation: $25.86/hr</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$27.90/hr</td>
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</table>

VIII. Industry Outlook for Engineering Services

*Data provided by IBIS World*

Overview

Key Statistics

- Revenue: $229.7bn
- Annual Growth 16-21: 3.5%
- Wages: $96.1bn
- Annual Growth 11-16: -0.1%
- Profit: $20.0bn
- Businesses: 136,408

Market Share
There are no major players in this industry.

**Key External Drivers**

- Value of private nonresidential construction
- Value of utilities construction
- Local and state government investment
- Demand from mining
- Value of residential construction

**PRODUCTS AND SERVICES SEGMENTATION (2016)**

Over the five years to 2021, the industry is anticipated to grow as increasing aggregate private investment allows for businesses to commit to long-term capital expenditures on new projects.
and facility upgrades. Growth is expected to be driven by demand from private nonresidential construction, which is forecast to increase an annualized 4.3% over the five years to 2021. Specifically, consumer sentiment now favors green building and clean energy projects, which presents an opportunity for the industry to expand into untapped markets. Additionally, investment activity by state and local governments are also projected to increase at an annualized rate of 0.6%, providing a boost to revenue streams from the industry's government contracts segment. As a result, revenue is forecast to increase at an annualized rate of 3.5% to $273.2 billion by 2021.

Over the next five years, the Engineering Services industry is expected to experience an uptick in demand due to rising private investment in large-scale projects. Specifically, industry revenue is projected to increase 2.8% in 2017. During the past five years, the industry was challenged by weak demand conditions in its key downstream markets as well as constrained government spending. As a result, large infrastructure projects were postponed or canceled, and access to credit tightened. However, improving sentiment regarding the US economy is forecast to result in strong growth in private nonresidential construction, with many of these projects put back on the agenda. The industry is also expected to benefit from increased emphasis on green buildings and construction. Rising demand from individuals and businesses will cause engineering companies to tailor design efforts to be increasingly environmentally friendly. A potential move away from fossil fuels in the energy sector toward renewable energy will also boost demand for industry services. Moreover, if President-elect Trump’s planned infrastructure spending outlays were to be passed by Congress, the industry would receive a boost in revenue in the government contracts segment. Overall, industry revenue is projected to grow at an annualized rate of 3.5% to $273.2 billion over the five years to 2021.

Private investment spurs growth

After several years of consistent economic recovery, more businesses are willing to commit to large projects that require engineering services, especially while interest rates remain low. The industry’s downstream markets are expected to expand and require engineering services to complete new major projects. Over the five years to 2021, the value of private nonresidential construction is projected to grow at an annualized rate of 4.3%, as more office buildings, factories, schools and other public structures are built. Rising aggregate private investment is expected to fuel growth in investment, while engineering service operators will experience an increase in demand.

Additionally, the construction of infrastructure related to power generation, sewage lines and water supply requires complex engineering services. The value of utilities construction is expected to increase an annualized 5.7% over the five years to 2021 due to the growing US population and its increasing power needs. However, growth in this area will be slow to start due to tempered local and state government investment, which is expected to increase at an annualized rate of 0.6% in the coming five years. Weak local and state government investment
does have the potential to constrain industry performance in the short term, especially regarding the government contracts segment of the industry.

Several other factors will boost demand for the Engineering Services industry over the five years to 2021, including growth in downstream demand from building, developing and general contracting, which are forecast to surpass the previous high points achieved last decade. Furthermore, private fixed-capital expenditure is expected to rise, driving up demand for engineering design and process-management services in the planning and installation of industrial equipment. Such expenditure is also expected to raise demand for asset management services for the maintenance and operation of existing projects.

**Green building emphasis grows**

Overall, interest in the construction of environmentally friendly buildings has been growing over the past decade. Over the five-year period, improving aggregate private investment will encourage operators to invest in new structures, including those with certification from the US Green Building Council. The Leadership in Energy and Environmental Design (LEED) standards have become a widely recognizable and understandable signal for building sustainability and performance. LEED standards will continue to develop over the next five years and will also include credits for the use of building materials that are sustainable. Engineering companies are expected to respond by focusing on more predesign work to achieve green solutions and benefits, such as reduced building operating costs and increased asset value.

Engineering companies are also expected to increasingly assist with environmentally friendly solutions for the energy and mining sectors. Recent agreements made at the Paris Climate Change Conference suggest that efforts to transition to clean energy will ramp up in the coming five years, spurring demand for industry services in the construction of renewable energy plants and distribution networks. This will extend to the mining sector, with mining operators also becoming more conscious of environmental damage due to changing regulatory conditions and possible reductions in investment in traditionally ‘dirty’ industries.

**Profit margins and employment**

The average profit margin for large-scale engineering companies will fall somewhat, even as they continue to provide multidisciplinary services and leverage their financial and technical resources, most notably through joint ventures and consortiums. Over the five years to 2021, industry profit margins are expected to fall slightly to 8.6% of industry revenue. This is likely a consequence of increasing price-based competition between industry operators. This competition is expected to stifle entry into the industry; over the five years to 2021, the number of enterprises in the industry is forecast to decrease at an annualized rate of 1.3% to 145,556 operators. Similarly, industry employment is expected to rise due to increasing demand for new nonresidential structures that will require engineering services; industry employment is expected to grow at an annualized rate of 2.7% to 1.3 million workers over the five-year period.
Firms in the Engineering Services industry provide services to a range of markets that require construction planning and design. Private businesses are the industry's largest market; however, many government construction programs also use private engineering services. Additionally, the industry provides services to specialized engineering, architectural and construction firms.

**Private businesses**

Private businesses are the largest market for industry operators, estimated to account for 43.4% of industry revenue in 2016. Major companies require engineering services for a variety of construction processes ranging from major commercial and industrial buildings to large residential complexes. Furthermore, some infrastructure projects, such as airports, are funded by private companies. Energy and gas companies also represent a significant market within the private businesses segment, as engineers are used to maintain compliance and ensure structural safety.

Over the past five years, demand from private businesses has increased, following a period of high government spending in place of low private investment. Since 2011, rising corporate profit and improving confidence precipitated renewed spending on construction and expansion on plants, resulting in more demand for engineering from private businesses. Falling levels of government spending allowed private industry to pick up the slack. Demand from private businesses is expected to grow over the five years to 2021 as companies take advantage of low interest rates before they are incrementally raised.

**Government bodies**

Government bodies at the local, state and federal level are estimated to account for 38.2% of industry revenue in 2016. Government bodies require engineering services for all municipal buildings and investment made in infrastructure. This includes hospitals, correctional facilities, airside facilities, highways and bridges and tunnels. Additionally, engineering services are required for environmental planning projects and waterways to ensure safe construction and operation.

Over the past five years, services to government bodies have declined as a proportion of industry revenue. This segment accounted for a significantly larger proportion of revenue in 2011 because of stimulus packages implemented by the federal government that were aimed at keeping workers in jobs while improving public infrastructure. At this point in time, many of these projects have been completed and reduced government spending and budget sequestration has hurt funding to new government projects.

**Engineering firms**

Engineering and architectural firms are expected to account for a respective 8.3% and 4.5% of industry revenue in 2016. These firms require engineering services for specialized installation,
operations, logistics, training and systems support services. Over the past five years, demand from these firms have recovered, as private investment returned to the market and increased demand for their services.

**Households and nonprofit organizations**

Individuals and nonprofit organizations are projected to account for 0.9% and 0.6% of revenue, respectively. These clients require engineering services for residential projects as well as for commercial construction in the case of nonprofit organizations. Both of these segments declined early in the period due to poor access to credit, but have since improved as consumer confidence has risen.

**Basis of Competition**

**Competition in this industry is high and the trend is increasing**

Competition in the Engineering Services industry is high as a result of the large number of firms operating in the industry and the high level of skill involved in completing industry services. Competition is principally based on experience, established linkages with client organizations and a reputation for quality. Specialized niche markets are an industry hallmark.

Competition in the industry is intense, particularly between small scale players in regional markets, and competitive pressures have heightened since the 2000s due to mergers between leading national and global engineering firms. The consequently larger companies have a capacity to compete across all market segments on a regional, national and international basis. The high degree of industry competition has also intensified due to the market entry of large-scale European consulting firms.

Price differentiation remains an important element in competitive tendering. Price competition is the most significant factor in tendering for public sector consulting contracts. Most state government and city administrators apply a strict bidding process that excludes consideration of other factors. This particular aspect of competition has intensified as demand for industry services weakened in the broader economy during the past five years. As demand diminished, industry operators continually offered lower bids in an effort to secure new contracts.

In specialized markets, a close and almost exclusive relationship often exists between consultants and the client. The engineering consulting firm will appoint former employees of the client firm as the principal consultants, ensuring that the consultant possesses intimate knowledge of client requirements. This helps streamline new business and ensure future contracts.

The increased globalization of this industry highlights the growing importance of economies of scale, or the cost advantages that are obtained due to larger operations, in the provision of technical and financial services on projects. The largest firms within this industry are able to provide substantial technical and financial resources to their domestic and global network of
branches and attract sufficient skilled labor to expand. In addition, the leading operators in this industry are increasingly forging close relationships with global partners that can provide them with access to advanced technology, vast financial resources and international marketing capacities.

There is a growing trend for players in this industry to join a development consortium comprising financiers and construction for the purposes of bidding on contracts. Forming a consortium enables participants to spread the risks and direct costs associated with tendering for contracts, enables operators to leverage each other’s strengths and increases the likelihood of a successful bid.

**Barriers to Entry**

Barriers to entry in this industry are **medium** and are **increasing**

Barriers to entry in the Engineering Services industry are moderate. The technical complexity of most projects undertaken by this industry effectively restricts the entry of new competitors to those with demonstrated capacities across a range of complex projects. A Bachelor of Engineering or Associate Diploma of Engineering is generally regarded as a bare minimum qualification.

Qualifications, sophisticated technical skills and expertise are prerequisites for entry to the industry. Many projects require a variety of tasks, including project feasibility; production line design and implementation; and design and management of construction. Scale can also pose a barrier to entry for operators that do not have the resources or capacity to complete complex projects, such as nuclear power plants or oil rigs. In some instances, technical equipment is custom-built and purpose-designed by or for the operating company and is therefore a barrier to entry.

Intimate knowledge of client requirements, often stemming from a close and exclusive relationship between consultants and clients, forms a barrier to entry for new entrants. Similarly, operators generally need to have prior experience in designing projects when dealing with highly specialized industries. For these reasons, new entrants and smaller operators commonly rely more on marketing techniques and word-of-mouth recommendations than large, established enterprises do.

Membership in professional associations, such as the New York Association of Consulting Engineers (NYACE) and the American Council of Engineering Companies (ACEC), may ease the entry of potential operators into this industry as such associations provide technical support on issues like professional indemnity, industrial relations, risk management and terms of engagement. Such associations will also likely provide the opportunity to build relationships with other operators or clients through networking.
The trend toward “design and construct” contracts, by both public and private sector clients, tends to favor the larger-scale firms to the detriment of independent consultants. Many of the larger scale operators in this industry have the in-house capacity to tender for prime construction contractor roles and can leverage these abilities to expand engineering services. This trend has also led to increased formation of consortia to bid on contracts, which is also likely to limit opportunities for new entrants. New entrants are less likely to be invited to join a consortium than existing players with established credentials and are unlikely able to match the financial, technical and networking strengths of a consortium when tendering for contracts.

**Industry Globalization**

Globalization in this industry is **low and the trend is increasing**

The industry has a low, but growing degree of globalization. About one fifth of industry revenue is generated by firms with majority foreign ownership. In addition, a growing share (5.0%) of US revenue is generated by projects undertaken outside of the United States. Most of the larger-scale firms maintain foreign operations. Fluor Corp., for example, maintains a network of offices across 25 countries; similarly, KBR Inc. operates subsidiary branches in over 120 countries. Many large operators also generate a substantial portion of their revenue overseas. For example, Bechtel generates a majority of its annual revenue on projects outside of the