

Chairs' & Center Directors' Meeting Minutes

Date: April 14, 2014 (12:00 to 2:00 pm)

Location: WCH – Room 443

Attendees: Abbaschian, Reza
Aguilar, Guillermo
Balandin, Alex
Barth, Matt
Bhanu, Bir
Bhuyan, Laxmi
Farrell, Jay
Garay, Javier
Haddon, Robert
Hartney, Pat
Matsumoto, Mark
Myung, Nosang
Najjar, Walid
Ravi
Rodgers, Victor
Vafai, Kambiz
Wang, Albert

Absent: Boretz, Mitch
Tan, Sheldon

The agenda for the meeting is shown in Appendix 1.

1. Welcome and call for agenda items - Reza

Reza stated that he will need to leave the meeting around 1pm to catch a flight to Washington D.C. He's on a committee reviewing space station requirements for NASA.

Reza called attention to the May 21st New Grid Ribbon Cutting event at CE-CERT. He encouraged all BCOE Chairs and Directors to attend.

Also, he announced the May 2nd Chair Investiture event. This event will recognize Victor Rodgers' appointment to the Yeager Chair in Bioengineering and Ashok Mulchandani's appointment to the W. Ruel Johnson Chair. There will be a BCOE Council of Advisors meeting that same day.

Nosang asked Ravi to discuss the funding being provided for the Brazilian students taking BCOE courses.

2. Approval of Minutes - Pat

The minutes of the March 17th Chairs/Directors meeting were unanimously approved.

3. Vision Presentation – Reza

Reza presented the Powerpoint slides that he used at UCR's April 2nd Strategic Visioning meeting. There were 21 (15 minutes) presentations from UCR units at this meeting. He noted that the Chancellor now wants to increase the number of additional UCR faculty from 250 to 300. Reza believes that BCOE and CNAS will receive priority for these new faculty lines. At the conclusion of the presentation, Reza asked Chairs/Directors to send him any comments and suggestions prior to his April 23rd presentation to UCR's Budget Committee.

4. Improving Graduate Engineering – Reza and Mark

Reza distributed copies of a white paper entitled "Engineering Grand Challenges and The Future of Engineering Graduate Education." He forwarded an electronic copy of this white paper last week. President Napolitano requested UCD Chancellor Katehi to prepare this white paper. The document proposes a UC-wide graduate education program in engineering that would train grad students around NSF's Grand Challenges. These 14 Challenges were later broadened to 10 social challenges including Food, Energy, Water, Health, etc. The proposed UC effort would involve all UC Colleges of Engineering. UCOP would provide about \$1M for 50 graduate student stipends. Campuses would need to provide about \$100K per student in tuition waivers. The Chairs noted that this proposed program is similar to NSF's IGERT program and its new Research Training (NRT) program. The Chairs felt that this was a promising idea but it was unclear which challenge areas BCOE could or should lead. Also, it was unclear if UCR would be willing to provide \$100K in tuition waivers per student participant.

5. Faculty Recruitment Updates – Chairs

ME: Guillermo stated that the department is waiting for a response to an offer made to a materials candidate. The deadline for this response is April 23rd. Since a suitable air pollution faculty candidate wasn't identified this year, ME is requesting this hire be replaced by a structural materials hire. The EVC/P is reviewing this request. The air pollution faculty hire would be delayed until next year.

MSE: Javier noted that there is good balance in this year's MSE related faculty hires.

CSE: Laxmi indicated that one senior candidate (in networking) has accepted an informal offer. The formal offer is being processed through CAP. One junior candidate offer (in security) is expected to be made soon.

CEN: Walid reported that one offer is being made but this candidate has already received a competing offer.

EE: Jay stated that two junior faculty hire offers have been made. One offer (in smart grid technology) has been accepted. A response from the second candidate (in navigation/transportation) is due by April 28th. Also, two candidates applied for the EE/CEE position. One senior Target of Excellence candidate will be visiting BCOE in May.

CEE: Nosang reported that the EE/CEE joint faculty hire has accepted our offer. The second Target of Excellence candidate will be visiting BCOE on April 24th. Harvey Blanch has drafted a white paper for a new UCR research center. Nosang can provide copies of this paper to Chairs/Directors upon request.

6. Graduate Education – Mark

Mark noted the summary of BCOE grad student Applications, Targets, Offers, Accepts, etc. attached to the agenda. This document indicates that there are 23 MS and 77 PhD Accepts in BCOE this year to date. Mark stated that the latest figures indicate that there are now 25 MS and 80 PhD Accepts. He noted that CEE has 26 PhD Accepts vs. its target of 14. The financial aid deadline for acceptances is 4/15/14. Mark noted that the total number of Accepts is about the same number as last year at this time. However, the number of offers has

increased. Mark noted that 26 International MS students have accepted offers but only six have submitted financial information so far. In response to a question, Walid indicated that CEN grad student offers will go out soon.

Lastly, Mark stated that Graduate Research Fellowship application packets are ready to be sent to incoming grad students. He reminded Chairs that incoming grad students will need advice from faculty mentors during the summer about appropriate research areas for these fellowship applications.

7. Undergraduate Education - Ravi

Ravi stated that the number of BCOE freshmen Accepts is about 160. The deadline for freshmen acceptances is May 1st. BCOE's freshmen target is 400 this year. Most freshmen acceptances occur near the deadline. Ravi reported that the quality of incoming freshmen should be higher than even last year's quality. BCOE hasn't accepted any freshmen with AIS scores below 4,150 this year. Waitlisted students will be used to meet program enrollment targets. The deadline for transfer student acceptances is June 1st. Ravi can provide the number of transfer student offers by department. The yield rate for these transfer students is about 15% (of offers).

Ravi stated that UNEX will be paying \$640 for each classroom seat used by Brazilian students enrolled through UNEX. Ravi will report to Chairs the number of these seats being used by UNEX this year.

8. Center Updates – Directors

CRIS: Bir is preparing a letter of intent for the new NSF Research Training (NRT) Program. This letter is due in about one month.

POEM: Alex reported that the center's move into MSE is progressing. Remaining equipment orders are expected to be received in May.

CNSE: Robert stated that NSF is inviting 15 MSREC proposals and that Georgia Tech is not one of them.

MSOL: Kambiz reported that the MSOL program is following up with application inquiries and is working with Pearson/Embanet on a possible joint marketing/recruitment effort.

9. Other Matters

No other matters were discussed.



Chairs' & Center Directors' Meeting

April 14, 2014

Agenda

Winston Chung Hall – Room 443

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| 1. | Welcome - Request for Agenda Items from the Floor | Reza |
| 2. | Approval of Minutes from March 17, 2014 Meeting | Pat |
| 3. | Vision Presentation | Reza |
| 4. | Improving Graduate Engineering | Reza |
| 5. | Faculty Recruitment Updates | Chairs |
| 6. | Graduate Education | Mark |
| 7. | Undergraduate Education | Ravi |
| 8. | Center Updates | Directors |
| 9. | Other Matters | |

Future Meeting Dates

2013

Monday, August 5
 Monday, September 9
 Friday, September 27
 Friday, October 11
 Monday, October 21
 Friday, November 15
 Monday, December 2
 Monday, December 16

2014

~~Friday, January 10~~
 Monday, January 27
 Monday, February 10
~~Friday, February 21~~
 Monday, March 3
 Monday, March 17
 Monday, March 31
 Monday, April 14
 Monday, April 28
 Monday, May 12
 Friday, May 30
 Monday, June 9
 Monday, June 23
 Monday, July 7

Engineering Grand Challenges and The Future of Engineering Graduate Education

Chancellor Linda Katehi
UC Davis
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In 2008, the National Academy of Engineering and the National Science Foundation unveiled the 21st Century's Grand Engineering Challenges, a list of some of the most pressing global problems that will only be solved if engineers and engineering educators focus renewed and integrated attention on them as we look ahead to the rest of this century and beyond.

Compiled after a diverse panel of experts from around the world was convened at the request of the National Science Foundation, the Grand Challenges provided a reasoned and compelling call to action designed to:

- Make solar energy affordable
- Provide energy from fusion
- Develop carbon sequestration methods
- Manage the nitrogen cycle
- Provide access to clean water
- Restore and improve urban infrastructure
- Advance health informatics
- Engineer better medicines
- Reverse-engineer the brain
- Prevent nuclear terror
- Secure cyberspace
- Enhance virtual reality
- Advance personalized learning
- Engineer the tools for scientific discovery

The fourteen challenges were later refined and amended to give them a broader scope and applicability to the overall population and the problems we all see presenting critical challenges to the world and its future. Those broader social challenges have been designated as follows:

1. Food
2. Energy
3. Water
4. Health
5. Security & Safety
6. Environment
7. Infrastructure
8. Poverty
9. Economy
10. Education

The National Science Foundation panel included some of the most accomplished engineers and scientists of their generation, who met between 2006 and 2008 to examine and define these challenges. Through an interactive Web site, the effort received worldwide input from prominent engineers and scientists, as well as from the general public. The panel's conclusions were also reviewed by more than fifty experts in specific subject areas.

All of the identified topics fall into four even broader themes that are deemed essential for humanity to flourish—sustainability, health, reducing vulnerability and joy of living. The committee did not attempt to include every important challenge, nor did it endorse particular approaches to meeting those selected. Rather than focusing on predictions or gee-whiz technological gadgets, the goal was to identify what needs to be done to help people and the planet thrive.

Since the Grand Challenges were released, many Engineering Colleges in the United States began aligning their undergraduate curricula according to this new imperative. A number of the colleges were able to provide robust opportunities for undergraduate students to experience learning that was focused on how these problems could be solved, but the programs remained small and were modestly integrated into the overall engineering curriculum.

What U.S. Engineering Schools have not tried yet is to create a research environment which focuses Graduate Engineering Education specifically around these Grand Challenges. Historically, Engineering Graduate Education and Engineering Research have tended to remain attached to the traditional Engineering problems, i.e., building a bridge, designing a rocket, etc. Even in cases where Engineering attempted to take a broader approach to its pedagogy by providing a bridge to issues regarding health and agriculture, for example, this was accomplished by the creation of Engineering Departments jointly with Medicine, Biomedical Engineering, or Agriculture, Biological and Agricultural Engineering.

The University of California, with nine of its ten campuses featuring prominent Colleges of Engineering, has the unique opportunity to rethink Graduate Education and find ways to refocus it on the ten broad Social Problems listed above without creating new departments and thus increasing infrastructure and cost. Following the lead of President Napolitano, we therefore envision a new multidisciplinary Engineering Graduate Curriculum which can become an example for other research universities in the United States and around the world.

We recommend creation of the ***UC Grand Challenge Engineering Graduate Program***. In this program, we propose to:

1. Create designated emphasis opportunities that align with the National Academy of Engineering Grand Challenges and develop academic and financial models for supporting them. This would include supporting development of system-wide graduate groups around these Grand Challenge designations.
2. Graduate Engineering applications would become a UC-wide process, the same as undergraduate applications. This would begin to consolidate a UC-wide engineering program around the Grand Challenges Education and Research, which in turn would attract a stronger aggregate pool of graduate students. It would also create opportunities for fundraising from new sources not tied to an individual campus who are motivated to support the STEM disciplines and system-wide economic development through graduate education and research.

3. Use online tools for the development and delivery of "Grand Challenges Seminars" to be completed by engineering students system-wide during their first year of study. Seminars would include problems to be addressed by system-wide teams of students. Solutions would be showcased by multi-campus teams in a public event.
4. Require students in designated-emphasis programs to engage with industrial or non-profit partners through internships, outreach to public policy organizations, or K-12 teaching in math and sciences in schools in underserved communities.
5. Create a system-wide graduate fellowship fund in support of the Grand Challenges designation areas. The fellowship could provide first-year full support to PhD students before they decide on an advisor. It could also be used to supplement the support provided by faculty on their research grants.
6. As part of our due diligence needed to develop this program as effectively as possible, we should collect data on state, national and global demand for Master of Science degrees on the part of students, and define what fields and geographic locations have shortfalls with regard to training, filling gaps as appropriate. This would also include system-wide market analyses for graduate programs.

As we proceed with establishing the new Grand Challenge Program, we should also take full advantage of opportunities to enhance our innovation culture and the overall graduate student experience.

Enhancing our Innovation Culture

- Create a UC venture capital fund that would be distributed within the system to allow faculty and students affiliated with this program to participate in the creation of start-ups. We would help incubate the start-ups within the relevant campus for an additional six to twelve months beyond what is customary. This would have an indirect, but very significant and positive impact on our ability to recruit outstanding graduate students.
- Streamline processes for handling intellectual property (IP), especially when driven by student innovators. Develop an accelerated path for IP and Technology transfer for students in which the university has six months to decide how to proceed or return all IP to the students.

Enhancing the Graduate Student Experience

- Improve the state of research instrumentation to enable research and education in these Grand Challenges areas. Departments have felt the pinch over the past five years as equipment renewal funds have been slashed. Consider setting aside some fraction of the overhead generated by grants to an equipment renewal fund administered by the campuses, in order to prevent losing ground in some areas to private universities such as Stanford, MIT, Penn, Caltech and public universities such as Michigan, Washington, Georgia Tech, etc. These shortcomings are reflected in recruitment of graduate students and faculty alike.
- A number of graduate students incorporate internships or outside work experiences into their doctoral programs. However, we do not usually allow for the possibility of reflecting their work experiences to their peers and faculty for credit. A systematic way of incorporating this into our pedagogy would be valuable and would also contribute to a greater level of being articulate and to leadership skills.

- Reward faculty for their participation in this program by considering their contribution in research and education as part of this program during promotion and tenure cases.

Funding the UC Grand Challenge Engineering Graduate program

- We propose creating a pilot program that incorporates a maximum of fifty graduate students. The Office of the President could provide the stipend for the graduate students (\$24,000 annually) while each campus could waive tuition for these students to provide a five-year, fully-paid fellowship for the PhD students. The Masters of Science students in the programs would be provided an in-state to out-of-state differential waiver.
- For a program that has about thirty doctoral and twenty masters students, the Office of the President would need to cover about \$1 million annually for student tuition and costs for on-line curriculum development. Each campus would have to contribute in waivers approximately \$100,000 per campus, for another \$1 million annual matching contribution.
- This pilot program could be assessed for its effectiveness and be extended, modified or terminated on the basis of its effectiveness. While limited in size at the outset, this exciting new program can become a catalyst for the University of California to rethink and re-imagine Engineering Education. The University could become a leader in providing graduate engineering education that is more focused and practically oriented to these Grand Challenges, strengthening the role of engineering as one of the primary engines for economic and social growth for the 21st Century, in California, the United States and around the world.

2014-15 COHORT

4/14/14

Program	Applications		Targets		Offers Made		In Process		Accepts		Declines		Decisions Pending		% of Target	
	MS	PHD	MS	PHD	MS	PHD	MS	PHD	MS	PHD	MS	PHD	MS	PHD	MS	PHD
BIEN	64	81	12	12	15	21	1	0	2	9	4	5	9	7	17%	75%
CEE	74	133	7	14	35	43	4	6	7	24	11	10	17	9	100%	171%
CEN	73	NA	10	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0%	NA
CPSC	587	249	25	25	43	49	18	2	3	15	0	20	40	14	12%	60%
ELEN	396	251	25	25	41	32	14	39	3	12	5	12	33	8	12%	48%
MSOL	1	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0%	NA
MSE	54	104	10	12	10	17	1	2	2	11	2	4	6	2	20%	92%
MCEN	101	88	13	11	28	19	5	3	6	6	4	6	18	7	46%	55%
BCOE	1350	906	102	99	172	181	43	52	23	77	26	57	123	47	23%	78%

2013-14 COHORT

4/15/13

Program	Applications		Targets		Offers Made		In Process		Accepts		Declines		Decisions Pending		% of Target	
	MS	PHD	MS	PHD	MS	PHD	MS	PHD	MS	PHD	MS	PHD	MS	PHD	MS	PHD
BIEN	63	77	15	15	23	30	3	4	6	11	5	8	12	11	40%	73%
CEE	78	139	7	15	20	54	1	1	3	23	11	21	6	10	43%	153%
CEN	49	NA	8	NA	3	NA	1	NA	0	NA	0	NA	3	NA	0%	NA
CPSC	543	243	15	15	16	34	10	3	6	16	4	14	6	4	40%	107%
ELEN	420	254	15	25	43	38	18	9	6	17	2	15	35	6	40%	68%
MSOL	1	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0%	NA
MSE	56	89	6	12	7	15	4	1	1	9	2	4	4	2	17%	75%
MCEN	95	65	8	10	27	9	13	3	5	3	7	4	15	2	63%	30%
BCOE	1305	867	74	92	139	180	50	21	27	79	31	66	81	35	36%	86%