

**ONR/NSF-Sponsored Faculty Workshop on
*Reforming Electric Energy Systems Curriculum***

Summary of Discussion

ECE Dept Heads and Deans

Co-Chairs:

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Date: Feb 5, 2010 (Tucson)

ECE Dept Heads/Deans Meeting
Reforming Electric Energy Systems Curriculum
Summary of Discussion

I . The survey was taken using “Clickers” (about 34 present).

II. Open Discussion

III. Actions?

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Survey Questions

(Faculty, funding, courses, delivery, adoption, UMN materials)

Question 1: Who is attending?

Question 2: # of power engineering faculty members in department?

Question 3: How many new power engineering faculty members does your department plan to hire?

Question 4: Is your administration give new funds for power engineering?

Question 5: Is your local power industry willing to give new funds for power engineering?

Question 6: How many full time faculty members does a minimal power engineering program need to have?

Question 7: How many power engineering courses does a minimal program need to offer?

Question 8: If you had only one course, what would it be?

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Survey Questions

Question 9: Are you concerned about student enrollment in a power engineering program?

Question 10: Are you concerned about raising funds for labs?

Question 11: Are you concerned about tenure-track faculty members finding research funding (in power area)?

Question 12: Can a good program be created with only instructors (only non-tenure track)?

Question 13: Can a good program be created with full time / permanent teaching-only (no-research) faculty?

Question 14: Would you consider using the UMN distance education format in addition to in-house courses?

Question 15: Would you consider using the UMN distance education format instead of offering in-house courses?

Question 16: If you cannot offer any in-house courses, would you consider using the UMN distance education format?

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Open Discussion

Addressing the challenges power systems brings to us in growth in enrollment via:

- Interest in renewable, etc.
- Aging workforce
- Shortage of faculty
- Budget cuts
- Administrative pressures

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- Admin is interested in helping, and student demand, but no resources. State budgets are tight.

- **Facilities and Faculty Issues:**

- Traditionally power courses and labs had low enrollment, so labs designed physically to be small, and now cannot accommodate the students in the lab given the administration's requirements of minimum enrollment but the physical limitations of the labs.

(Cannot rebuild due to budget issues.)

- Departments downscaled power before, but now need to grow them back, and be innovative and exciting.

- **Need funding for untenured faculty, so they can get tenure.**

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- - **Recognize “Power” has broader needs today**
 - Utilities need telecom, computer engineering, networking people, etc. to address smart grid issues. But these aren't always considered part of “Power”. Can we have students take broader set of classes, so they have some power, and some communications?
 - **How can professional societies and others help?** (like IEEE, ASEE, ECEDHA) do to help? Some IEEE society have surplus!

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Open Discussion

• Students want to feel they “are making a difference”, “saving the world” - we don’t always give them that full and right “message”.

• Students are disappointed - want “green” and other interesting and new energy topics, but they aren’t getting the excitement from the classes because they don’t cover these topics much.

• Perception of Energy/Power as not being exciting frontier

• Students are making choices now: before power was boring, but now students are looking at power, but still undecided. (Students don’t yet see it as exciting, but more interest now than before.)

• Students want to be on a frontier, but being in power means working for a large company, which means not being on a frontier (old-way).

-Also – we need to teach entrepreneurship – even doing so in large companies and small – need to embrace the notion of changing the world and the opportunities there.

• Our economy depends on new technologies, and our students don’t seem to understand or recognize the importance of how technology moves ahead. There is excitement in that. Students need to understand how important technology is and how much it has changed and continues to change the world.

• Student perception: Power (esp. T&D) not where the best and brightest students go (regional – not true across US).

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• **Recognize and foster multidisciplinary nature of energy/power**

• Multidisciplinary area – (example: mechanical, civil engineering and smart homes, business, etc.) need to understand and recognize this, how “green jobs” cover more.

- One way to do this: multidisciplinary collaboration on senior design classes

- (Univ. of Cincinnati – renaming and breaking down and reassembling departments to “schools” with new names. “programs” are then offered through the schools (same traditional degrees).

Purpose -- appeal to broader set of students, also encourage more multidisciplinary. Faculty choose a primary and secondary school, and appointed in both. (to be effective this July). This is breaking the old rules and doing something new.

- (Univ. Central Florida – offers multidisciplinary class on senior design – very successful, interest by industry.)

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- **Need to stress importance of engineering – for advocacy and recruitment**

- Need to excite young people about engineering: Deans of Engineering from Michigan just came out with a white paper that ties economics of state to number of engineers in state. So, this is being used to drive engineering interest at the K-12 programs. Focus is on collaborating with K-12 educators, tying to standards, etc. Encourage other states to look at this also.

- Why is Mech. Engr. growing and not EE? Issue is robotics, materials, energy, biomedical, and other areas formerly in EE have been grabbed by ME depts.. We need to reclaim EE areas, especially energy. (Look at last years ECEDHA website on “reclaiming EE” – ecedha.org)

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What is the right forum for such a meeting?

What else should we be doing to involve chairs and grow the programs.

- Great opportunity to have chairs together.
- This has been very useful

Should we create action items?

Propose a workshop for department heads on how to address challenges and opportunities in delivering innovativeness in our ***Electric Energy Systems Curricula.***

Action Item:

Ad-hoc committee to be formed to organize ECE chairs meeting to discuss these raised issues (volunteers?....)

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Thank you!

Questions?