MY CAREER EDUCATION PLAN

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General Strategies

- Focus on **multi-physics** engineering majors
  - Electrical Engineering
  - Mechanical Engineering

- Specific Aims
  - The project aims to disseminate the research results to university students, practicing engineers, and the general public and to promote participation of women and under-represented minorities in undergraduate and graduate engineering education to advance equal participation and advance diversity

- Specific activities
  - Courses and tutorials for university students and practicing engineers
  - Graduate Student Professional Development in Teaching
  - Educating the General Public via TV and Web Videos
  - Camp Badger
  - Saturday Science at the Wisconsin Institute of Discovery (WID)
  - Workshops for Counselors and Science Teachers

Objectives

- Educate future and existing workforce to effectively develop integrated multi-physics motors, compressors, fans and pumps
- Educate and disseminate research results and benefit K-12 and college students by engaging them in research activities
- Diversity the population of students engaged in science and engineering education
- Develop workshops for counselors and science teachers

My Education Plan #1

Education Plan #1: Disseminate research results via credit courses, short courses and tutorials, TV and web recordings for university students, practicing engineers and the general public

Objective: The *objective* of this aim is to educate the future and existing workforce to effectively develop integrated multi-physics motors, compressors, fans, and pumps for many applications.

My Education Plan #1

- University Students
  - Graduate level course, ECE 905 (Power Electronics Systems for Sustainable Energy)
  - Undergraduate level course, ECE 356 (Electric Power Processing for Alternative Energy Systems)

- Practicing Engineers
  - Teaching use existing six short courses on electrical engineering
  - Develop two new short courses and conference tutorials on motors, power electronics, compressors, fans and pump motor designs using research results from CAREER project

My Education Plan #1

- Graduate student professional development in teaching
  - Taking *Delta's College Classroom Course* to learn effective pedagogy
  - Work as a Delta intern to develop materials for short course
- Educating the general public via TV and web videos
  - Wisconsin Public Television Website
  - IEEE TV series or being a panelist
  - Presenter in corporate, university and government settings
- Assessment
  - Surveys for short courses and conference tutorials to access effectiveness of presentations
  - Other faculties and subject matter experts review and feedback for effectiveness of teaching

My Education Plan #2

Education Plan #2: Promote excitement and interest for the field of electrical engineering by engaging K-12 and college students with the goal to increase the number of female and under-represented students from diverse backgrounds pursuing careers related to electrical engineering

Objective: The objective of this aim is to benefit K-12 and college students by engaging them in a variety of activities to help them to be better able to make informed decisions when considering engineering education. These activities will also act as an important recruitment tool to diversify the population of students engaged in science and engineering education.

My Education Plan #2

- Camp Badger
  - Engage students in age-appropriate research-based activities about motors, turbines, compressors and fans
  - Include and demonstrate examples of wind power and compressed air storage systems
- Saturday Science at the Wisconsin Institute of Discovery (WID)
  - Research results will be demonstrated to society via WID specifically young students, to inspire further interest in electrical and other areas of engineering
- Assessment
  - Surveys to assess the participant's interest and understanding of engineering
  - Evaluating the interest distribution in engineering as a filed of study
  - Refinement of the activities will be made based on the surveys.

My Education Plan #3

Education Plan #3: Develop workshops for counselors and science teachers to help them to be better equipped to educate middle and high school students about engineering.

Objective: The *objective* of this aim is to develop workshops for counselors and science teachers.

My Education Plan #3

- Workshops for counselors and science teachers
  - Better inform high school counselors and science teachers about the modern and exciting aspects of electrical engineering
  - Educate them how to prepare students to successfully meet admission requirements
  - Workshop topics focus on contemporary research and teaching activities
  - At least **two** workshops and free of charge
  - Will invite female engineering alumnae to speak in the workshops

- Assessment
  - Separate surveys of speakers as well as overall workshop will be assessed to improve the content for future workshops

Overview of Education Plan

Education Plan #1: Disseminate results to students and general public

Education Plan #2: Promote engineering to K-12 and college students

Education Plan #3: Workshop for Counselors

		Year 1		Year 2		Year 3		Year 4		Year 5	
Specific Aim	Tasks	Q1&2	Q3&4	Q1&2	Q3&4	Q1&2	Q3&4	Q1&2	Q3&4	Q1&2	Q3&4
Disseminate results to students and general public	4.1										
	4.2										
	4.3										
	4.4										
Promote engineering to K-12 and college students	5.1										
	5.2										
Workshop for Counselors	6.1										

Final Thoughts

- Education Plan should be integrated with research plan
- Additional effort will be made focusing on promotion of young people and to underrepresented demographics
- Effort will be made to recruit the next generation of engineers
- Timetable and assessment for educational plan are impactful and received good feedback from reviewers

Collaboration Letters

- Dr. Thomas Jahns (Dept. of Electrical and Computer Engineering, UW-Madison)
- Dr. Greg Nellis (Dept. of Mechanical Engineering, UW-Madison)
- Aaron Williams (Arnold Magnetic Technologies)
- Dr. Burak Ozpineci (Oak Ridge National Laboratory)
- Dr. Robert Mathieu and Dr. Don Gillian-Daniel (Center for the Integration of Research, Teaching, and Learning and Delta Program in Research and Teaching, UW-Madison)
- Dr. Phillip O' Leary (Camp Badger, UW-Madison)
- Dr. Laura Heisler (Morgridge Institute for Research)
- Anuradha Ogale (Schlumberger)
- Dr. Jennifer Vining (Oscilla Power)
- Leah Haman (Wisconsin Alumni Research Foundation)