

Building A Robust Workforce in Electric Power Engineering by Democratizing Technical Education





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Welcome to CUSP

The vision behind CUSP™ is to provide all the resources an instructor needs in teaching his/her own courses in the field of Electric Energy Systems with an emphasis on sustainability. This effort has been funded from various organizations including NSF, ONR (Office of Naval Research), NASA and EPRI and is totally free-of-cost under the Terms of Use conditions.

CUSP Welcome Video



NSF Workshop 2022

NSF Workshop ECE Department

Crisis in Power Engineering Education:
A National Security Concern
Minneapolis, MN October 21-22, 2022

To view the Workshop (click the image
below):



Low Cost Laboratory

New low-cost basic and advanced
electric drives laboratory.

Courses Developed and Uploaded to CUSP

Power Systems (22 credits)

1. Power Systems + Lab (3 + 1 Credits)
2. Advanced Power Systems I (3 Credits)
3. Advanced Power Systems II (3 Credits)
4. Power Gen, Op and Control (3 Credits)
5. Protection and Relaying (3 Credits)
6. Electricity Markets (3 Credits)
7. High Voltage Technology (3 credits)

Electric Machines/Drives (12 credits)

1. Electric Machines/Drives (3 Credits)
2. Vector Control of Drives (3 Credits)
3. Electric Machine Design (3 Credits)
4. Finite Element Analysis for Designing Electrical Machines (3 credits)

Additional Courses being developed (12 Credits):

1. High Power Electronics in Power Systems: HVDC and FACTS – partially developed (3 Credits)
2. Energy, Environmental Policies, and Regulatory Issues (3 Credits)
3. Control for Power Electronic Systems (3 Credits)
4. Solar Electric Systems, Fuel Cells, Battery Storage Systems (3 Credits)

Renewable Energy (3 credits)

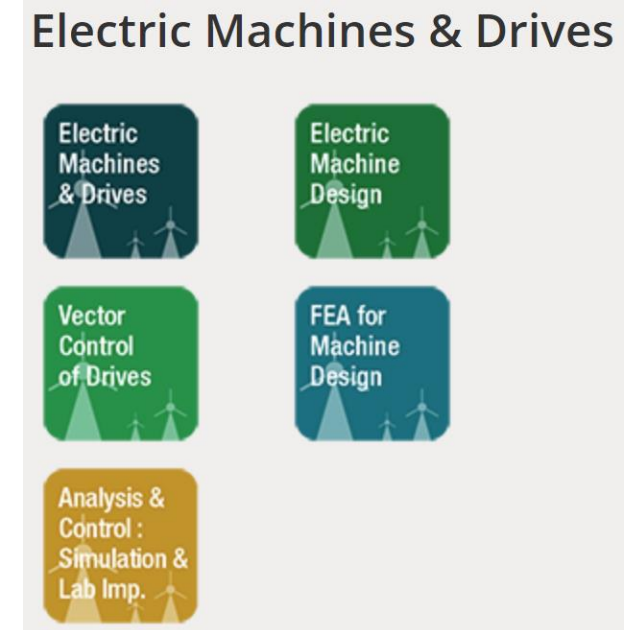
1. Wind Energy Essential (3 Credits)

Power Electronics (10 credits)

1. Power Electronics + Lab (3 + 1 Credits)
2. Advanced Power Electronics I (3 Credits)
3. Advanced Power Electronics II (3 Credits)

Credentials of the Developers and the material

- Seven are members of the NAE.
- Sixteen are Fellows of the IEEE.
- There are 11 underlying textbooks.



CUSP Academy - Goal

- Teach some of the 19 Senior/Graduate-Level Courses and Labs developed by ONR funds and uploaded to CUSP.
- Keep these courses from getting outdated and keep developing and uploading new courses that are relevant.
- Allow member universities to expand their offering of graduate courses in power.

CUSP Academy - Rationale

- Highly educated Workforce to meet increasing demands related to electric energy.
- Make a large selection of courses available to students and industry nationwide.
- Keep certain power-related courses, critical to national infrastructure, from disappearing. Example: High Voltage Technology, Reliability in Power Systems, Use of FEA to Design Electric Apparatus.

Pathways to Enable Open-Source Ecosystems (POSE)

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