Electric and Renewable Power Systems Minor

About the Electric and Renewable Power Systems Minor

The minor in Electric and Renewable Power Systems provides a specific academic path for students to study electric and renewable power systems, such as smart grids, solar photovoltaic energy, wind energy, power system distribution systems, etc. The minor is experientially focused, with labs in several classes, senior capstone project, and co-op experience in the renewable energy or power industry. The goals of the program are to give students a deeper understanding of technical aspects of electric and renewable power systems, while at the same time, introduce ethical and global perspectives on energy related topics.

Curriculum

The minor in Electric and Renewable Power Systems is a four course (16 semester hour) undergraduate minor administered by the Department of Electrical and Computer Engineering. Students must also include power/energy designs into their 8 semester hour senior capstone project. There should be at least one co-op experience in industry, a research lab, or a government agency that has technical focus in the energy related field.

Required Courses:

1. Students must have at least one coop experience in the energy related field.

2. Students are required to enroll in 8 SH capstone design course where there specific participation in the project must be related to the energy field. This does not imply that the entire project must be related to energy, but that the student earning the minor must work on topics related to energy (battery management circuit, power conversion, etc.)

3. Students must take four courses from the following list:

   At minimum three of four courses must be taken from section A, and at most one course from section B. (or something similar to this)
   It is permissible for the elective to also count as an NU Core Elective if it is appropriate to fulfill the LVL 1 core elective in either Arts/Humanities or Social Science (see www.neu.edu/registrar/nucore.html). The list below in section B is tentative and students may petition to include other classes.

   Section A - Core Courses (at least 3 of 4 courses)

EECE 5684	Power Electronics	4 SH
EECE 5680	Electric Drives	4 SH
EECE 5682	Power Systems Analysis 1	4 SH
EECE 5686	Electrical Machines	4 SH
EECE5698	Special Topic: Energy Harvesting Systems	4 SH
EECE5698	Special Topic: Analysis Unbalanced Power Grids	4 SH
ENGR5670	Sustainable Energy	4 SH

   Section B - Electives (at most 1 of 4 courses)

   BIOL1145: Environment and Humankind
   CHEM 5651: Materials Chemistry of Renewable Energy (instructor permission)
   CIVE2334: Environmental Engineering
   ECON3423: Environmental Economics (Pre-req ECON 1116 Micro Economics)
   ECON 3425: Energy Economics (Pre-req ECON 1116 Micro Economics)
   EECE 3392: Electronic Materials ?
   EECE 4512: Biomedical Electronics
   EECE 4524: VLSI Design
   EECE 4604: Semiconductor Device Theory
   EECE 4694: Numerical Methods and Computer Applications
   EECE 5580: Classical Control Systems
   EECE 5666: Digital Signal Processing
   ENTR 3325: Sustainable Innovation (Pre-req ENTR 2301 Innovation)
   ENVR1101: Environmental Science
   ENVR1110: Global Climate Change
   ENVR 1111: Weather and Climate
   ENVR4515: Sustainable Development
   HIST 2342: Environmental History of North America
   HIST 3412: Global Environmental History
   ME4680: Energy Systems (Prereq. ME 2380 Thermodynamics)
   ME 5645 Environmental Issues in Manufacturing and Product Use

MEIE: 4600 Systems Design Sustainability
PHIL1180: Environmental Ethics
PHYS 1132: Energy, Environment, and Society
POLS2395: Environmental Politics
SOCL1246: Environment and Society
SOCL 3485: Environment, Technology and Society (Prereq. SOCL 1101)

Partial List of Companies that ECE is currently working with or developing:

1. ABB
2. AHA Consulting Engineers
3. AKF Group
4. Cosentini
5. DCI Engineering Services
6. Duke Energy
7. General Electric
8. Glumac
9. Greenvolts
10. NStar
11. National grid
12. Ostrow Electric
13. Solectria Renewables
14. Source One
15. WSB Engineering Consulants
16. WSP Flack & Kirtz