Wind Energy

The wind energy minor is primarily intended for students majoring in engineering or atmospheric sciences, but is available to all that meet the prerequisites, Math 166 and Physics 222. The minor is comprised of 15 credits, of which 6 are required of all students obtaining the minor. As per the University Catalog, at least 9 credits cannot be used to satisfy any other degree, program or University requirement.

Importance of Wind Energy Minor
Wind energy is a pivotal component of our nation’s future energy portfolio, particularly given the desire to reduce the carbon footprint through the use of renewables. The Midwest region is among the richest wind regions in the nation, with Iowa being the second leading state in the nation as measured by installed wind capacity of 3670 MW, after Texas. This minor will help provide this industry (planners, manufacturers, developers, utilities, and maintenance providers) with technical students with the knowledge and understanding of the science, engineering and policy of wind energy.

Student Learning Outcomes
The objectives of the proposed Minor are to provide a broad understanding of the wind energy industry from component design and manufacturing, electric generation, transmission, and grid operations, to policy.

• Communicate objectives of a long-term national energy portfolio and how wind energy will contribute to meeting those objectives
• Understand the wind energy systems and design tradeoffs for the large components (e.g., blade, turbine, tower, and foundation)
• Manufacturing and supply chain considerations for economic production.
• Identify problems and potential solutions associated with integrating high wind penetrations into the electric grid.
• Communicate most significant reliability problems for wind turbines and be conversant with related monitoring technologies and maintenance methods to address them.
• Identify effects of existing and potential policies on wind energy growth

Learning outcomes will be assessed using tests, quizzes, homework and term papers.

Required Courses
Course descriptions can be found here (http://www.engineering.iastate.edu/eri/initiatives/strategies/wei/education/wind-energy-minor/wind-energy-minor-course-descriptions)

- ENGR 340 Introduction to Wind Energy: System Design & Delivery 3
- AER E 381 Introduction to Wind Energy 3

Elective Courses
Course descriptions can be found here (http://www.engineering.iastate.edu/eri/initiatives/strategies/wei/education/wind-energy-minor/wind-energy-minor-course-descriptions). Choose 9 credits.

- AER E 422 Vibrations and Aeroelasticity 3
- AER E 423 Composite Flight Structures 3
- AER E 481 Advanced Wind Energy: Technology and Design 3
- C E 460 Foundation Engineering 3
- C E 541 Dynamic Analysis of Structures 3
- I E 543 Wind Energy Manufacturing 3
- MAT E 362 Principles of Nondestructive Testing 3
- E E 451 Engineering Acoustics 3
- E M 451 Engineering Acoustics 3
- M E 451 Engineering Acoustics 3
- E E 452 Electrical Machines and Power Electronic Drives 3
- E E 457 Power System Analysis II 3
- E E 459 Electromechanical Wind Energy Conversion and Grid Integration 3
- M E 325 Mechanical Component Design 3
- M E 411 Automatic Controls 3
- M E 417 Advanced Machine Design 3
- M E 421 System Dynamics and Control 4
- MTEOR 405 Environmental Biophysics 3
- MTEOR 407 Mesoscale Meteorology 3
- MTEOR 411 Synoptic Meteorology 3
- MTEOR 417 Mesoscale Forecasting Laboratory 3
- MTEOR 432 Instrumentation and Measurements 3

How to Apply
2. Obtain a signature from your academic adviser.
3. Submit the form to Dr. Frank Peters.

For more information contact:
Dr. Frank Peters
Associate Professor – Industrial & Manufacturing Systems Engineering
3004 Black Engineering Bldg. - mailing address
3024 Black Engineering Bldg. - office address
515-294-3855
fpeters@iastate.edu