



Wind Energy Education University of Wyoming Experience

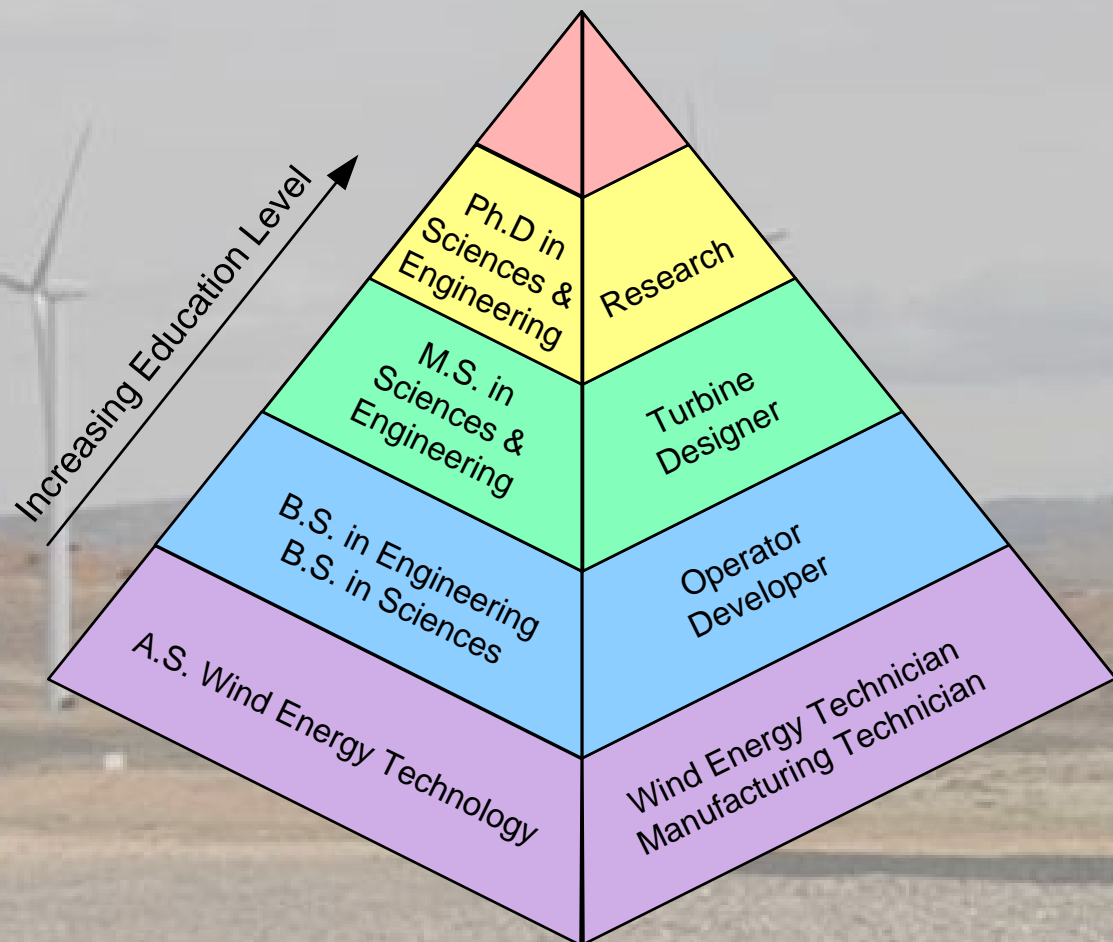
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Workforce Needs at Many Levels

- **Wind energy education – the need**

- Many reports document the need for a trained workforce for the U.S. wind energy industry
- Hubs of activity will require workforce at all levels
- Educational programs provide the training environment to allow the individual to pursue the level of education desired





Wyoming Educational Programs

- **Wind Energy Technology**

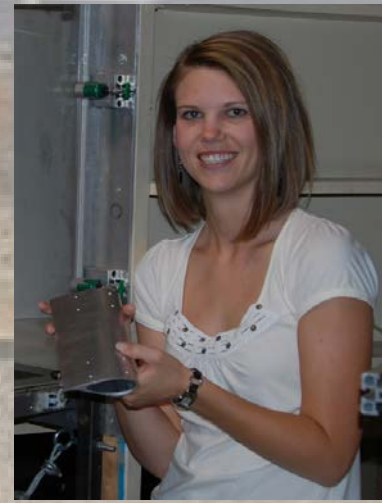
- Laramie County Community College (LCCC), Cheyenne, WY
- Focus is on developing technical professionals by meeting industry standards

- **B.S. in Engineering or Science**

- Energy Systems Engineering
- Degree focused on energy conversion
- Energy electives taken during years 3&4
- Wind and tidal energy
 - **30 students in course each yr**
- Solar and geothermal energy

- **Graduate Degrees in Wind Energy**

- M.S. and Ph.D. in traditional disciplines
- Research focus has application to wind energy
- About 20 students have participated to date with > 10 graduates





University of Wyoming DOE Grant for M.S. in Wind Energy

- **DOE Workforce Grant to explore feasibility**
- **6 students selected in 2 groups**
- **Undergraduate degrees**
 - 3 Mechanical Engineers
 - 1 Electrical Engineers
 - 1 Physicist
 - 1 Earth System Science and Engineering
- **Graduate degrees**
 - 5 Mechanical Engineering
 - 1 Electrical Engineering
 - 5 of these chose to write a thesis – surprise!
- **3 students are currently employed**
 - High Performance Computing
 - Wind Resource Specialist
 - Ph.D. in Wind Energy Science
- **3 students will complete degree Summer/Fall 2013**
- **Program considered a success**
 - Interdisciplinary degree trains students for working in a wide range of fields including wind
 - Wind energy provides a context for complex systems



Proposed Interdisciplinary M.S. in Wind Energy

Semester 1		Semester 2	
Core Course 1	3	Core Course 4	3
Core Course 2	3	Wind Integration Course 1	2
Core Course 3	3	Wind Integration Course 2	1
Elective	3	Wind Integration Course 3	2
		Wind Integration Course 4	1
		Elective	3
TOTAL	12	TOTAL	12
Semester 3–Option 1		Semester 3 – Option 2	
Elective		Internship	6
Elective			
TOTAL	6	TOTAL	6
Semester 3–Option 3			
Thesis Research	4		
Seminar	2		
TOTAL	6		



Proposed Interdisciplinary M.S. in Wind Energy

- **Core Courses (12 credits)**

- Chosen from a list of courses available at home institution

- **Fluid Mechanics**
- **Boundary Layer Meteorology**
- **Control Theory**
- **Power Systems**
- **Structural Analysis**

- Chosen from 2 or more traditional areas

- Provide a strong technical foundation

- **Electives (6 credits)**

- Provides additional study in one or more technical areas available at home institution

- **Integration Courses (6 credits)**

- Chosen from 6 mini-courses on wind turbine applications

- **Wind Resource Modeling,**
- **Wind Turbine Aerodynamics and Aeroelastics**

- **Wind Turbine Dynamics and Control**

- **Wind Turbine Foundations and Towers**

- Taught by academic, gov't & industry experts

- **Options**

- Provides flexibility

- **2 Additional courses**

- **Approved internship**

- **Research project + thesis**



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