NAWEA Presentation
by
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Integrating Real-World Case Studies into Wind Energy Graduate Education

Texas Tech University
Wind Science & Engineering
Thank You
Research and Education

NWI overview
Aerial image
Mission statement

TEXAS TECH UNIVERSITY
National Wind Institute

33° 36' N
102 2' W

200 meter tower

GE 2 MW Wind Turbine
Gamesa 2 MW Wind Turbine
SNL 900kW Wind Turbine
Alstom 1.87 MW Wind Turbine
GE 2.5 MW Wind Turbine
Reese Center

200 meter tower
Vision

The NWI Educational Programs provide a comprehensive suite of high quality, multi-disciplinary educational opportunities that support the workforce needs of the wind energy industry.

Opportunity

– Wind energy along with other renewable electric technologies is a rapidly growing global industry
– Last year (2013) approximately 45% of the new electric capacity installed globally was a renewable technology
– TTU / NWI Educational Programs are one of only a few in the nation to support a US workforce of approximately 80,000.
National Wind Institute
TEXAS TECH UNIVERSITY

Education Program

• Undergraduate Programs
  – Bachelor of Science in Wind Energy
  – Minor in Wind Energy
  – Undergraduate Certificate

• Graduate Programs
  – Graduate Certificate Programs
    • Advanced Technical Wind Energy (for engineers and scientists)
    • Advanced Managerial Wind Energy (for managers, business and legal professionals)

• Outreach Programs
  – Global Component, BSWE, Study Abroad in Germany
  – Partnership with TTU WCOE and Jade University-summer 2014

528 enrollments (20 graduated)
30 Graduate enrollments
Graduate Education

Partners:
TTU’s NWI
DNV-GL

TEXAS TECH UNIVERSITY
National Wind Institute
Graduate Education Partners

Case studies presented by Dr. Kim Mortstock in Seattle, with DNV-GL

Case studies presented by Dr. Chris Elkinton in Portland, with DNV-GL
Multi-Year Contract agreement between TTU/DNV-GL

Student course fees cover cost to deliver case studies

Face-to-face and on-line delivery
   Lync and MediaSite
   Lecture-capture mode (videos)
   Blackboard (education platform)
   Distance Education (e-learning) Group
Graduate classes working with DNV-GL

1. Advanced Technical Wind Energy 1 & 2

2. Advanced Managerial Wind Energy 1 & 2

Additional Graduate Courses:
Power Systems Engineering, Wind Power
Meteorology, Renewable Energy Policy,
Energy Options and Futures, Finance, or
Risk Modeling and Assessment
Fall Classes
1. Off shore
2. Community impact
3. Turbine Technology
4. Site suitability

Spring Classes
5. Site suitability (part 2)
6. Finance & Sensitivity analysis
7. Turbine under-performance
8. Off-Shore Construction & O&M logistics

DNV-supplied high-level homework
New Case Studies each fall semester
Results

Example: Tanzania

What did the students get out of the experience?

Student feedback

Very positive experience
Very enriching
Greater understanding

Stretch their knowledge
Pushed them into areas of unfamiliarity
Pushed the limits of individual knowledge
STEM/MBA
Other Graduate Program
Renewable Industry Work Force
Post-class relationship