Distance Education in Nuclear Engineering at the U. of TN: a Possible Model for Canada?

Presented by

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Presentation Outline

• Overview of the U. of Tennessee (UT) System
• Overview UT Distance Education (DE)
• Overview of the UT Nuclear Engineering (UTNE) Dept.
  – UTNE Enrollment History
• Overview UTNE Distance Education Programs
  – What programs we offer and how the programs are delivered
  – Show 2 minute movie illustrating delivery technology
• Provide contact information
Overview of UT Distance Education

• In early 1990’s, UT delivered DE courses via high tech classrooms connected statewide by T1 lines (video conferencing)
  – Very expensive to install, operate, and maintain
• Abandoned in 1999 in favor of CENTRA, which provides real time delivery of classes (i.e., live and interactive) to student’s computer located anywhere via the Internet
  – Local on-campus students and distance students taught simultaneously using a touch sensitive SmartBoard
    • movie demonstration later
  – Live classes are also recorded and available online 24/7
  – Dial-up connection to Internet is sufficient
  – Currently 15 MS programs and 4 MBA programs are delivered via CENTRA serving ~ 1000 students located all over the U.S. (also outside of the U.S.)
UTNE Department Overview

- UTNE Department founded in 1957
  - Offer BS, MS, PhD degrees, and three Graduate Certificates
- Two tracks: Traditional and Radiological
  - Produced ~ 1000 graduates in past 53 years
- Graduate program ranked No. 9 by *U.S. News and World Report* (No. 8 among public universities)
- Faculty: 14 tenure/tenure track faculty members; 16 research professors (part-time); over 36 adjunct professors (part-time)
  - 7 of the 14 tenure/tenure track faculty hired in the past 3 years
- Enrollment: 252 students (Fall, 2009)
  - Fourth largest nuclear engineering program in U.S.
- More detailed information is in our *Annual Report* at [www.engr.utk.edu/nuclear](http://www.engr.utk.edu/nuclear)
University of Tennessee
Nuclear Engineering Enrollment

57 Grad
119 UG

46 Grad
130 UG

63 Grad
140 UG

62 Grad
156 UG

67 Grad
163 UG

76 Grad
166 UG

82 Grad
170 UG

Nuclear Engineering
UTNE Offers Eight DE Programs

- M.S. in Nuclear Engineering (NE)
- M.S. in Reliability and Maintainability Engineering
  - Interdepartmental Program (NE, ME, IE, ChE)
- Graduate Certificate in Nuclear Criticality Safety
- Graduate Certificate in Reliability and Maintainability Engineering (NE, ME, IE, ChE)
- Graduate Certificate in Nuclear Security (New)
- One week short course on Nuclear Criticality Safety
- One week short course on Neutron Transport Theory
- Colloquium Program (free and open to public)
UTNE Graduate Education via DE

• 15 NE courses are currently offered via distance
  – 13 are synchronous; live and interactive in real time (CENTRA)
  – 2 are asynchronous via CD

• At least 8 courses required for the MS degree
  – Plus at least one independent research project (e.g., MS thesis)

• Only 4 courses required for a Graduate Certificate
  – Research project not required
  – Certificate is about half-way to the MS degree

• At least 8 additional courses beyond the MS required for the PhD
  – Plus original research project (i.e., PhD dissertation)
  – Not all 8 additional courses for PhD are available via distance
    • 1-year residency on campus is required for the PhD
Interesting ‘DE Twist’

• Usually, instructor is in a classroom on campus with several local students, and several distance students located anywhere off campus connected via Internet
  – Occasionally, an instructor on travel will deliver a few real time lectures from his hotel room to both local students on campus and distance students

• We have one faculty member on assignment in Portsmouth, Ohio (~ 300 miles from campus) who delivers all of his lectures for two different courses from Portsmouth, Ohio to local students located on campus and distance students located anywhere
Possible ‘DE Twist’ via Collaboration among Several NE Programs

• Experts at different locations could deliver interactive, real time courses to students located anywhere via the Internet using CENTRA; ideal for large countries such as Canada
  – Not necessary for instructors and students to be at the same location for most courses
  • Instructors can be located anywhere and students can be located anywhere
    – U. of New Mexico, Ohio State U., and 5 other small NE programs plan to collaborate using DE
    – Big 12 Consortium (Iowa State, Texas A&M, et al.) is already collaborating this way (asynchronous delivery only)
Colloquium Program
(Free and Open to the Public)

• Invited speakers from industry, government, and academia give presentations to local audience on campus and to cyber audience via live web cast
  – Live web cast file is captured and archived at www.engr.utk.edu/nuclear/colloquia/Archive/
  – We have over 10 years of archives
  – Questions from cyber audience are submitted by email and answered in real-time during web cast

• Delivery technology totally different from CENTRA
  – Two cameras, two technicians, MediaSite hardware

• Satisfies continuing education requirements for PE license in South Carolina and Tennessee
Distance Education Benefits to UTNE

• UTNE currently has ~ 24 DE graduate students, which is ~ 25% of our graduate student enrollment
  – DE students in Brazil, Japan, New York, Miami, Seattle, New Orleans, Memphis, etc., and nearby in Oak Ridge
  – One DE student on vacation in Nepal used a satellite connection to attend a real time class
  – Another DE student is collaborating with our faculty on a research proposal to DARPA
• Considerable visibility and national recognition
• Genuine appreciation from distance students
Movie Illustrating CENTRA Technology

- Three segments in movie
  - First segment shows room, Smart Board 3000, instructor (Ron Pevey), technician, 4 local in-class students and 5 distance students logged in
  - Second segment shows Pevey lecturing using a Power Point slide and “electronic chalk and talk”
  - Third segment shows what distance students see
    - Instructor (Wes Hines) gives control to a distance student who then begins a presentation (homework assignment) that all students and instructor see and hear in real time
This movie will not win an Oscar!
Thank You!

Questions?
Contact Information

• UTNE Department
  – Email: utne@tennessee.edu
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