

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

Presented by

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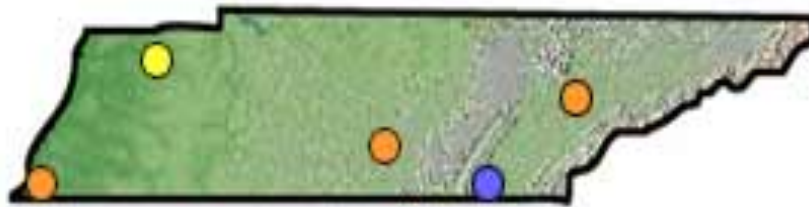
June 2010



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**

The University of Tennessee System



- The University of Tennessee (Knoxville, Memphis, Tullahoma)
- The University of Tennessee at Chattanooga
- The University of Tennessee at Martin



Management Contractor for DOE's
Oak Ridge National Laboratory



Overview of UT Distance Education

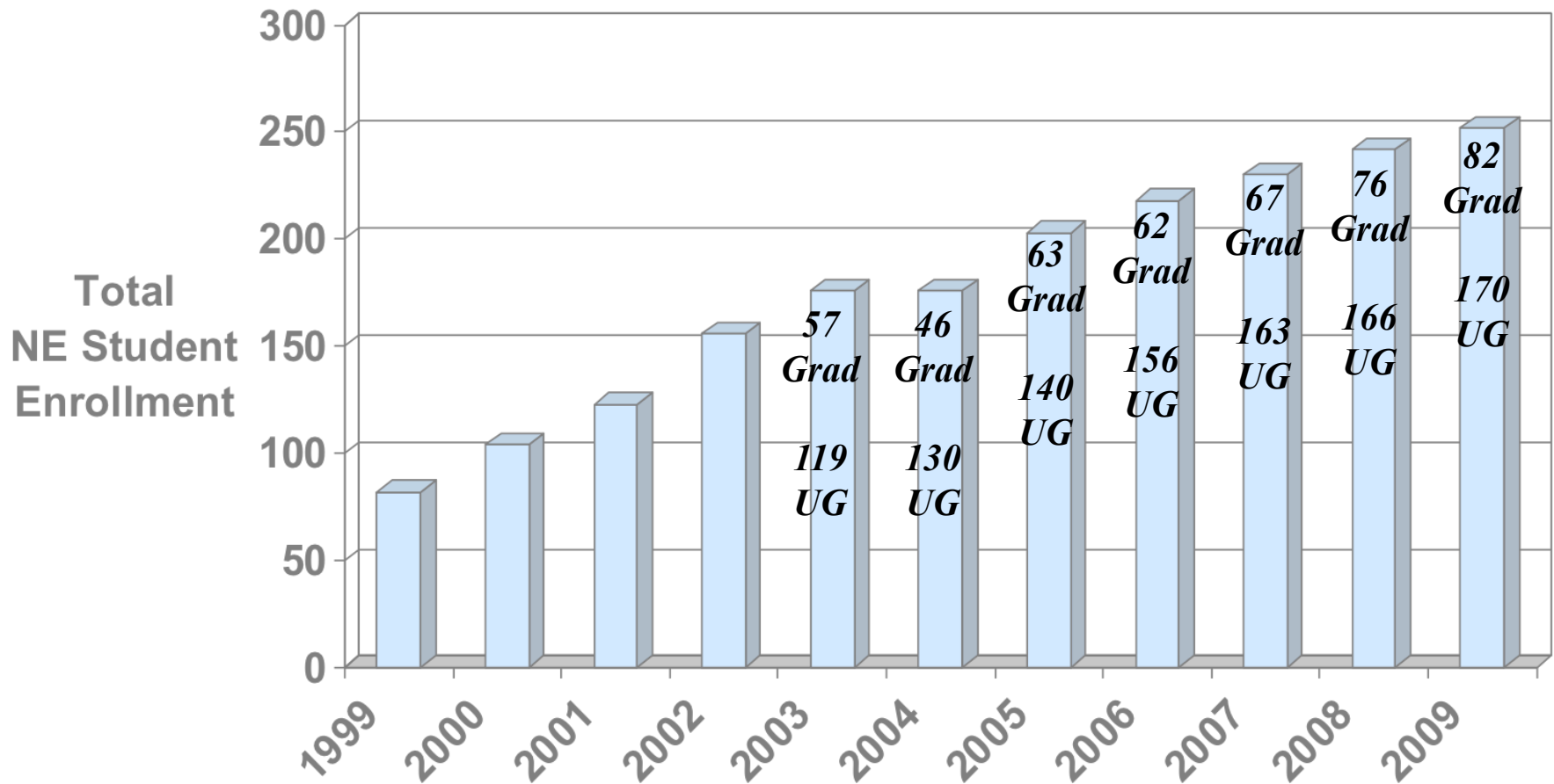
- **In early 1990' s, UT delivered DE courses via high tech classrooms connected statewide by T1 lines (video conferencing)**
 - **Very expensive to install, operate, and maintain**
- **Abandoned in 1999 in favor of CENTRA, which provides real time delivery of classes (i.e., live and interactive) to 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**

University of Tennessee

Nuclear Engineering Enrollment



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**

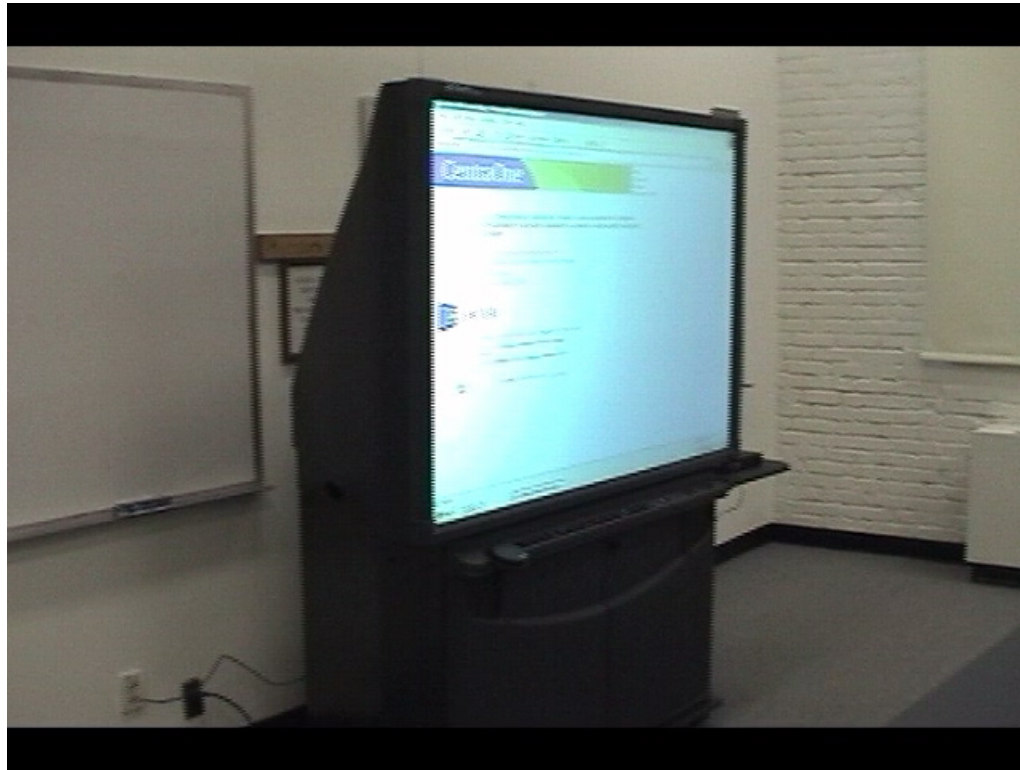
Distance Education Benefits to UTNE

- **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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