Distance Education and Information Technology

A Progress Report
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USC Distance Education Network
- History

- Established in 1972 by the School of Engineering
- Offering a one-way video, two-way audio broadcasting system based upon microwave technology
- More than 20 Southern Calif. companies subscribe, e.g. TRW, Hughes, Aerospace, JPL, etc.
- In 1998 ITV offered 140 credit courses to 1800 students
USC DEN - Other Delivery Systems

- Leased T1 lines connect USC with Raytheon in Tucson and NASA/Ames
- Satellite gives us broadcast potential across the U.S., Eight sites including Qualcomm, Motorola, Lockheed-Martin Sunnyvale & Palmdale, Ericsson
- Videotapes of pre-recorded lectures

Distance Education and the Internet

- Widespread adoption of Internet access makes it feasible to deliver instruction to a worldwide audience
  - Currently there are about 100 million people with Internet access and virtually all have web browsers
  - Consequently there is a national trend among universities and companies to develop and deliver via the Internet credit/non-credit courses
- Our target audience: college graduates with a technical degree, mostly 25-50 yrs old, working, who want an MS degree or who need to update their skills
The Competition
Stanford Online

250 courses/yr to
200 corporate sites;
Primarily grad-level
EE & CS courses;
Also offer 1 day - 1 week seminars

DEN Webcasting

- The process of taking a conventionally delivered course and transforming it for delivery on the Internet/Web
- transform the lecture to streaming audio/video
- transform all written materials into web pages
- transform exercises and exams into interactive web pages
- provide chat and threaded email support
- this approach is transparent to faculty
Webcasting Process

- Lectures are fed by camera to computers
- Converted to digital form using Osprey 1000 video capture card
- Tranformed into Active Streaming Format for delivery at high speed and low speed using Microsoft NetShow Video Server
- Instructor notes/displays etc. are obtained and transformed into a slide show that can be seen in a web browser
- Both high/low speed webcasts are augmented with pointers to instructor notes/displays
- Resulting files are placed on a course web page where a video server can deliver them when requested
An Example: Boeing and USC Systems Engineering

- USC and UM-Rolla have recently won a contract to provide MS level courses to ALL Boeing sites, in System Engineering.
- Delivery of courses is being made to:
  - Seattle area including Bellevue, Renton, Puget Sound
  - St. Louis Mo.
  - Wichita, Kansas
  - Southern CA: long beach, seal beach, downey, canoga park
- Creating a novel, new studio as a prototype for future EAC labs

Our Curriculum

- M.S. degrees in
  - Aerospace Engineering
  - Computer Science (with specializations in Networks, Multimedia, Software Engineering)
  - Computer Engineering
  - Electrical Engineering (with specializations in Aerospace Controls, Networks, Multimedia, VLSI Design)
  - Systems Architecture
  - Computer-Aided Engineering (Masters of Engineering)
Current WebCast Software Engineering Courses

- Computer Science
  - 455 Introduction to Programming Systems Design
  - 565 Compiler Design
  - 577b Software Engineering, Boehm/Madachy

- Industrial and Systems Engineering
  - 460 Engineering Economy, Higgins
  - 515 Engineering Project Management, Hilscher
  - 541 Systems Engineering Methodology, Jackson
  - 561 Advanced Engineering Economy, Higgins

Quality of WebCasting

- There has not been a lot of time for evaluation, but several studies are underway
- The Univ. of Illinois has recently done a survey of 23 online courses, 1033 students, and 17 faculty
  - 82% of students reported being highly satisfied
  - 57% of the students reported improved interaction with faculty
  - 88% of faculty reported favorable attitudes toward delivery of learning to remote students
Follow Up

- To find out more about becoming a subscriber to USC Distance Education Network, see http://www.usc.edu/dept/engineering/Distance_Learning/index.html and click on Membership.
- To view webcast classes see http://webclass.usc.edu/