ELE 498D: SPECIAL TOPIC:
TELECOMMUNICATION SYSTEMS – CONVERGED COMMUNICATIONS (elective)

Credit: 3 hours.

Catalog Description: Regularly scheduled courses in advanced topics in electrical engineering. May be repeated to a maximum of 3 semester hours.

Prerequisites: Consent of department.

Textbooks(s) and/or Other Required Materials: Communication Networks, Fundamental Concepts and Key Architectures by Alberto Leon-Garcia and Indra Widjaja (2nd edition preferred).

Topics Covered:

1. Layering and Applications (Chapter 2)
2. Performance Analysis (Appendix A + lecture)
3. Digital Transmission Fundamentals (Chapter 3)
4. Digital Telephony overview (Chapter 4 + lecture material)
5. Networking Protocols (Chapter 5)
6. Local Area Networks and Medium Access Control (Chapter 6)
7. Packet Switched Network Operation (Chapter 7)

Optional Topics: (Covered based on student interest and available time)

1. TCP/IP Details (Chapter 8)
2. ATM Networking (Chapter 9)
3. Converged Voice/Data Communication (lecture and notes, not in text)
4. Building for High Availability (lecture and notes, not in text)
5. Advanced Architectures for Integrated Networking (Chapter 10)
6. Security and Cryptography (Chapter 11)

Class/Laboratory Schedule:
Lecture: 2.5 hours/week
Lab: none

Course Objectives and Relationship to Program Outcomes:

1. Addresses the fundamental aspects of digital and data communications (Outcomes A, B, C, E, I, K).
3. Teaches the ability to design and analyze communication networks to solve contemporary problems through in class team exercises and homework (outcomes A, C, D, E, G, H, J, K).
4. Term project simulating a typical network design problem in industry (Outcomes C, D, E, F, G, J, K).

Coverage (and level) of ABET Outcomes:  A (3), B (1), C (3), D (1), E (3), F (1), G (2), H (1), I (1), J (1) and K (3).

Contribution of Course to meeting the Professional Component:
  Engineering Topics:  100%

Date:  June 2004.
Credit: 3 hours.

Catalog Description: Regularly scheduled courses in advanced topics in electrical engineering. May be repeated to a maximum of 3 semester hours.

Prerequisites: Consent of department.


Topics Covered:

- Introduction – History and Context (Chapter 1 + lecture)
- Digital Telephony Fundamentals (Chapters 2 and 3)
- Digital Baseband Signals (Chapter 4)
- Digital Switching Fundamentals (Chapter 5)
- Telephony Services (Lecture and exercises, not in the text)
- Building Reliable Systems (Lecture and exercises, not in text)
- Digital Modulation and Radio (Chapter 6)
- Network Synchronization (Chapter 7)
- Fiber Optic Transmission (Chapter 8, 8.1-8.4)
- Synchronous Optical Multiplexing (Chapter 8, 8.5-8.6)
- Digital Cellular Systems and Standards (Chapter 9+ lecture)
- Digital Subscriber Access (Chapter 11)
- Data Networks (Chapter 10 + lecture)
- Converged Networking (lecture and exercises, not in text)
- Network Design Exercise (Presentation by students in ELE 598D)

Optional Topics: (Covered based on student interest and available time).

Class/Laboratory Schedule:

- Lecture: 2.5 hours/week
- Lab: none

Course Objectives and Relationship to Program Outcomes:

1. Addresses the fundamental aspects of digital voice communication (Outcomes A, B, C, E, I, K).
3. Teaches the ability to design and analyze communication networks to solve contemporary problems through in class team exercises and homework (Outcomes A, C, D, E, G, H, J, K).
4. Term project simulating a typical network design problem in industry (Outcomes C, D, E, F, G, J, K).

Coverage (and level) of ABET Outcomes: A (3), B (1), C (3), D (1), E (3), F (1), G (2), H (1), I (1), J (1) and K (3).

Contribution of Course to meeting the Professional Component: Engineering Topics: 100%

Date: June 2004.