DEREE COLLEGE SYLLABUS FOR:

ITC 3221 TELECOMMUNICATIONS ESSENTIALS – LEVEL 5
(Updated Fall 2013)

US Credits: 3/0/3
UK Credits: 15

PREREQUISITES:

CS 1070 Introduction to Information Systems
CS 3175 Communications and Networking Essentials

CATALOG DESCRIPTION:

Data communications technologies. Voice communication systems. Messaging systems. The public switched telephone network. Connectivity and internetworking of LANs. Broadband networking environments. Network convergence and regulation frameworks.

RATIONALE:

The course is intended for students following the Networks and Telecommunications emphasis of the IT major. It exposes students to wide range of concepts, from fundamentals to technical details, converged network architectures, technologies, and connectivity. Focus is placed on specialized communication and networking needs, including voice communication, messaging systems, and video and multimedia networking.

The course is intended for students following the Network Technologies emphasis of the IT major.

LEARNING OUTCOMES:

As a result of taking this course the student should be able to:

1. Demonstrate knowledge and understanding of voice communication and messaging systems.
2. Analyse switching, signaling, controlling, and network infrastructure in a PSTN.
3. Evaluate performance factors associated with network cabling.
4. Assess local area networking needs and choose an appropriate solution whether wired or wireless
5. Evaluate broadband networking infrastructure needs.
6. Explore broadband technologies and wireless technologies

In congruence with the Learning and Teaching strategy of the College, the following tools are used:

METHOD OF TEACHING AND LEARNING:

- Lectures, class discussions, and review of real-world cases based on specific theoretical concepts. Laboratory practical sessions.
- Office hours: Students are encouraged to make full use of the office hours of their instructor, where they can ask questions and go over lecture material.
- Use of the Blackboard Learning platform, where instructors post lecture notes, assignment instructions, timely announcements, as well as additional resources.

ASSESSMENT:

Summative:

Project: the design and implementation of a small-scale telecommunications system.	**50**
Final Examination (2-hour comprehensive): combination of short answers to essay questions and case problems	**50**

Formative:

In-class, 1-hour, "diagnostic" test: short answers to essay questions	**0**
Coursework: case problems	**0**

The formative assessments aim to shape teaching along the semester and prepare students for the summative assessments.

The project tests Learning Outcomes 1, 4, 5.

The final examination tests Learning Outcomes 1-6.

(Guidelines and assessment rubrics are distributed on the first day of classes along with the course outline.)

INDICATIVE READING:

REQUIRED READING:

Shepard Steven, Telecom Crash Course, Second Edition, McGraw-Hill Professional (2005) ISBN: 0071451439.

RECOMMENDED READING:

Goleniewski L. & Wilson Jarrett K., Telecommunication Essentials: The Complete Global Source, 2nd ed., Addison-Wesley Professional (© 2006).

Newton H., Newton's Telecom Dictionary, 25th ed., Flatiron Publishing (© 2009).

COMMUNICATION REQUIREMENTS:

Daily access to the course's site on the College's Blackboard CMS. Use of word processing and/or presentation graphics software for documentation of assignments.

SOFTWARE REQUIREMENTS:

Microsoft Office suite

WWW RESOURCES:

ITU is the leading United Nations agency for information and communication technology issues:

http://www.itu.int/en/pages/default.aspx

Telecom Resources: (http://www.answerconnect.com/articles/telecom-resources)

Telecommunications News: (http://www.zdnet.com/topics/telecommunications?tag=mantle_skin;

content)

International Telecommunication Union: (http://www.itu.int/en/pages/default.aspx)

Telecoms research site:

http://www.telegeography.com/index.php

Telecommunications Industry Association:

http://tiaonline.org/

National Telecommunications and Information Administration:

http://ntia.doc.gov/

Telecommunications research site on the internet:

http://www.budde.com.au/

TM Forum is the world's leading industry association focused on enabling best-in-class IT for service providers in the communications, media, defense and cloud service markets:

http://tmforum.org/browse.aspx

Business Driven Solutions for the Information, Entertainment and Communications Industry:

http://www.atis.org/

INDICATIVE CONTENT:

1. Overview of technologies and applications
2. Overview of data communications
3. Voice Communication Systems
   - 3.1. Telephone systems
   - 3.2. Private branch exchanges
   - 3.3. Automatic call distributors
   - 3.4. Computer telephony
   - 3.5. IP Systems
4. Messaging systems
   - 4.1. Facsimile machines
   - 4.2. Voice processing systems
   - 4.3. Electronic mail
   - 4.4. Instant messaging
   - 4.5. Overview of mobile messaging
5. Public switched telephone network (PSTN)
   - 5.1. Numbering plan administration
   - 5.2. Domains
   - 5.3. Signaling and control
   - 5.4. Voice IP (VoIP)
6. Conventional digital and data networks
7. Local area networks (LAN): Connectivity and internetworking
   - 7.1. Dimensions, equipment, operating systems, standards
   - 7.2. Virtual LANs

- 7.3. Wireless LANs (802.11 a/b/g/n and beyond)
- 7.4. Nonstandard LANs
- 7.5. Storage area networks

8. Broadband networking infrastructure and network services
   - 8.1. Access technologies, SONET/SDH, IEEE 802.17
   - 8.2. Frame relay
   - 8.3. Switched multimegabit data service
   - 8.4. Asynchronous transfer mode (ATM)
   - 8.5. Metropolitan Ethernet
   - 8.6. Broadband ISDN
   - 8.7. Advanced intelligent networks (AINs)
9. Overview of wireless networking
   - 9.1 Introduction to Cellular Radio
   - 9.2 Cell Radio Standards: 1G, 2G, 3G, and 4G (LTE)
   - 9.3 Satellite Systems
   - 9.4 LEO, MEO, GEO priciniples and operation
10. Video and multimedia networking
    - 10.1. Analog TV standards
    - 10.2. Digital TV and high-definition TV
    - 10.3. Bandwidth, compression, and video standards
    - 10.4. Internet protocol television (IPTV)
    - 10.5. H.320 multimedia standards
    - 10.6. Session initiation protocol
    - 10.7. H.248 media gateway control
    - 10.8. Videoconferencing systems and equipment
    - 10.9. WAN videoconferencing networks
    - 10.10. Video over IP
11. Network convergence
12. Regulation issues