Course Brief and Outline: 2011

Ling Cheng

School of Electrical and Information Engineering
University of the Witwatersrand

January 31, 2011

Outline

Course Background and Purpose

- the current state of telecommunications transmission, switching, access and signalling as well as the telecommunications services that the technology makes possible.
- historical and emerging technologies to enable the student to understand the evolution process.
- a Masters Programme in telecommunications as a foundation for more specialised courses.

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Course outcomes

- Display literacy in the basic concepts and principles telecommunications in the areas listed in Course Content
- Use standard abstractions, tools and techniques
- Apply fundamental concepts and principles to solve problems in telecommunications
- Apply a selection of telecommunications standards to the solution of problems

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Course Content

- Essential background to telecommunications.
- Circuit-switched network evolution.
- Switching based on PCM-encoded signals.
- Software for telecommunications equipment.
- Packet switched network principles.
- Signalling and intelligence in the network.
- Essential concepts of communications.
- Fundamentals of pulse code modulation.
- Fundamentals of transmission.
- The Plesiochronous Digital Hierarchy.
- Synchronous Digital Hierarchy.
- Asynchronous transfer mode.

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Prior knowledge

This course assumes a general Electrical Engineering or Computer Science background but does not require any prior knowledge in telecommunications.

Assessment

- Project (Weight 40%).
- Examination (Weight 60%) .

Assessment Criteria:

- Display Literacy by producing a majority of correct answers in multiple choice and short answer questions on telecommunications concepts and principles.
- Apply Message Sequence Charts (MSC) and Specification and Description Language (SDL) to describe processes.
- Solve problems using a systematic approach, correctly applying concepts and principles.
- Use an ITU-T, ETSI or IETF standard to support solving a telecommunications problem.

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Lectures and Tutorials

Lecture Dates: 31 January; 1, 7, 8, 14, 15, 21, 22, 28 February; 1, 7, 8 March 2011.
Lecture Times: 11:00-13:30 each day.
Lecture Venue: Room CM 3, Chamber of Mines Engineering Building, Wits West Campus.
There are no official tutorial sessions, however if there is substantial interest a dedicated tutorial session could be arranged towards the end of the course. 5:5:10 rule.

Lectures and Tutorials

The textbook "Integrated Digital Communications" by H.E. Hanrahan is supplied to students.
Further information and announcements regarding the course is posted on the course home page (http://dept.ee.wits.ac.za/~cheng/ELEN7001_IDC/) All students are expected to consult the course home page at regular intervals.