



# HI108V Data Communications II, Wireless 7.5 credits

Datakommunikation II, trådlöst

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for HI108V valid from Spring 2012

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

First cycle

## Main field of study

Electrical Engineering, Technology

## Specific prerequisites

**Completed upper secondary education including documented proficiency in English corresponding to English A.**

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

Datacom II is a continuation course focused on Wireless Communications.

After the project course the student should know:

- Wireless Systems / Mobile Broadband
- IEEE 802.x
- SatCom / Microwave links
- Mobile phone systems 1G- 4G

## Course contents

Course contents: Transmission Fundamentals. Signals for Conveying Information. Analog and Digital Data Transmission. Channel Capacity. Transmission Media. Multiplexing. Communication Networks. LANs, MANs and WANs. Switching Techniques. Circuit-Switching. Packet-Switching. Asynchronous Transfer Mode. Protocols and the TCP/IP Suite. The Need for a Protocol Architecture. The TCP/IP Protocol Architecture. The OSI Protocol Architecture. Internetworking. Antennas and Propagation. Antennas. Propagation Modes. Line-of-Sight Transmission. Fading in the Mobile Environment. Signal Encoding Techniques. Signal Encoding Criteria. Digital Data, Analog Signals. Analog Data, Analog Signals. Analog Data, Capacity Allocation & Frequency Division. Capacity Allocation & Time Division. Cellular Wireless Networks. Principles of Cellular Networks. First Generation Analog. Second Generation TDMA. Second Generation CDMA. Third Generation Systems. Cordless Systems and Wireless Local Loop. Cordless Systems. Wireless Local Loop. IEEE 802.16 Fixed Broadband Wireless Access Standard. Mobile IP and Wireless Access Protocol. Mobile IP. Wireless Application Protocol. Wireless LAN Technology. Overview. Infrared LANs. Spread Spectrum LANs. Narrowband Microwave LANs. IEEE 802.11 Wireless LAN Standard. IEEE 802 Protocol Architecture. IEEE 802.11 Architecture and Services. IEEE 802.11 Medium Access Control. IEEE 802.11 Physical Layer. Bluetooth. Overview. Radio Specifications. Baseband Specification. Link Manager Specification. Logical Link Control and Adaptation Protocol.

## Disposition

Course disposition: The course is in English and of half time studies. The course is a distance course on Internet. For further information in English, please contact the teacher.

## Course literature

Wireless Communications and Networks, 2nd Edition,

William Stallings, 2005, 576 pp

Prentice Hall,

ISBN-10: 0131918354

ISBN-13: 9780131918351.

Digital Course Notes Datacom II, 3 CDs, 1.5 GB, L.O. Stromberg

## Equipment

You will need:

- \* A personal computer (PC) running Windows XP/ Vista/ 7
- \* Internet access
- \* two working email addresses (do not use free webmail clients, use POP3)
- \* A scientific pocket calculator

## Examination

- ANN1 - Assignments, 1.5 credits, grading scale: P, F
- ANN2 - Assignments, 1.5 credits, grading scale: P, F
- ANN3 - Assignments, 1.5 credits, grading scale: P, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Examinations are offered three times a year: typically the first Saturday in May, August, and December.

Written examinations are four hours long, and consist of 68 questions; 60 of which are multiple choice (5 choices each) and 8 are in depth questions, including mathematical calculations. The Final examination in IT-Sec III is a lab project.

Written examinations worldwide can usually be arranged at other universities, as well as at Swedish embassies and consulates.

## Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.

- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.