FIL3607 UWB Technologies and Applications 7.5 credits

UWB Teknik och tillämpningar

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

Establishment

Course syllabus for FIL3607 valid from Autumn 2012

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Master's degree

Language of instruction

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

Intended learning outcomes

Understand and master the UWB communication system including UWB transmitter and receiver architecture. Be able to simulate the UWB communication and analyze in Matlab.

Course contents

The wireless wideband communication is rapidly attracting more attention due to the need of more users and more information with higher data rates. Ultra wideband (UWB) technology based on the ultra-narrow pulses in nanosecond or picosecond level, featuring a very wide bandwidth in the frequency domain, could be able to provide such service. This course will focus on the development of the UWB technology, the current UWB technology, and its potential applications. Basic implementation methods of the UWB transmitter, receiver, and how this technology can be realized without causing interference to the other coexist narrowband wireless technologies such as WiFi, Bluetooth, etc. are also discussed. How the UWB technology can be used to realize accurate positioning service is another important topic.

Disposition

Three parts:
Part I, Introduction to the UWB technology including the background of the short-range communication technologies and systems and the development of short-range communications.
Part II, State-of-the-art of the UWB technologies, the UWB based communication systems, and the challenges of UWB system design.
Part III, UWB based applications (mainly focus on the location capability).

Course literature

Shor-Range Wireless Communications Emerging Technologies and applications

Publisher John Wiley and Sons, Ltd.

ISBN: 978-0-470-69995-9 (H/B)

Examination

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.

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

Write a technical paper and have it published in an international conference.

Other requirements for final grade

An oral presentation and an international published (accepted) technical paper.

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.