Study Board for Electronics and it grants dispensation to use revised learning objectives for the course Wireless PHY/MAC fundamentals which is included in the curricula for the programmes:

- Msc in Wireless Communication Systems, ver 2011
- Msc in Network and Distributed Systems, ver 2011

The revised learning objectives are defined in the document “Wireless PHY/MAC Fundamentals fall 2016”. The dispensation applies for fall 2016 only.

The dispensation will be available at the study board’s homepage: [http://www.sict.aau.dk/electronics-and-it/curricula](http://www.sict.aau.dk/electronics-and-it/curricula).

Sincerely

Ove Andersen
Study Board for electronics and it
Desired new content description for E16 execution

Wireless PHY and MAC Fundamentals (C)
Trådløse PHY og MAC grundbegreber

Prerequisites:
A basic understanding of wireless communications fundamentals, mathematics and statistics corresponding to a BSc in Electrical Engineering.

Objectives:
Students who complete the module:

Knowledge:
Must have knowledge about the following:

- Fundamental communication theory for wireless transmission
  - Classical communication theory
  - Noise handling in wireless communications
    - Loss and channel models (Friis transmission formula)
    - Analog chains, noise factor
    - Digital chains, coding
  - Detection and demodulation theory (coherent vs non-coherent)

- Transceiver architectures, blocks and components
  - Transceiver structures and synchronization (incl. duplexing and access aspects)
  - Non-ideal components (non-linearities, compression and intercept)
  - Dynamic range and link budget
  - S-parameter description of components
  - RF/u-wave measurements of wireless communication blocks and chains

- Modelling and simulation of transceiver systems
  - Complex baseband representation of pass-band communication
  - Signal distortion due to block imperfections

Skills
Must be able to:

- Establish a link budget
- Synthesize a transceiver system on a block diagram level
- Describe the modifications that a signal undergoes through a transceiver chain
- Calculate key performance characteristics for a full transceiver chain based on specifications for the individual blocks
- Simulate the transmission of digital data through a full transceiver chain - including transmitter, lossy and noisy wireless channel, and receiver
Competencies

Must be able to:

- Discuss and evaluate the impact of different transceiver blocks in a communication link
- Set up a simulation model to assess and evaluate the performance of (digital data) transmission over a wireless communication link

Type of instruction:
As described in the introduction to Chapter 3.

Exam format:
Individual oral or written examination

Evaluation criteria:
As stated in the Framework Provisions