



# HÖGSKOLAN I GÄVLE

## Radio Systems 7.5cr

*Radiosystem 7,5hp*

Set by Board of Technology and Built Environment

**Version**

**Set at**

**Valid from**

12/10/08

**HT2008**

|                            |                   |
|----------------------------|-------------------|
| <b>Level</b>               | A1F               |
| <b>Education level</b>     | Second cycle      |
| <b>Course identifier</b>   | EE430D            |
| <b>Credits</b>             | 7.5cr             |
| <b>Main field of study</b> | Electronics       |
| <b>Subject group</b>       | Electronics       |
| <b>Disciplinary domain</b> | Technology 100.0% |

**Learning outcomes**

The students should upon passing the course be able to understand and apply the most important techniques for analyzing the performance of radio, radar and wireless multi-user communication systems.

The course consist of two parts: A lecture course and Matlab assignments

**Course content**

- Introduction to Radio Communications
- Radio wave propagation and modelling
- Link budget calculations
- Radio channels, fading, multipath and channel modelling
- Diversity Systems
- Multi user communications
- Principles of cellular systems
- Mobility management: Handover.
- Transmitter power control:
- Frequency Hopping
- DS-CDMA
- Simulation techniques for performance evaluation of Wireless Systems. RUNE
- Introduction to RADAR Systems

|                                |  |                     |       |           |
|--------------------------------|--|---------------------|-------|-----------|
| <b>Teaching</b>                | The education is performed in lectures, exercises, and Matlab assignments. The assignments are normally performed in groups of three students. Emphasis is put on the students ability of accomplishing and reporting the work. The education is not mandatory for the student, except for the laboratory work and assignment tasks. |                     |       |           |
| <b>Prerequisites</b>           | Corresponding to Cellular Networks, Statistical Signal Processing and Modulation and Coding  |                     |       |           |
| <b>Examination</b>             | Written examination and Assignment reports.  |                     |       |           |
| <b>Grade</b>                   | A, B, C, D, E, Fx, F   |                     |       |           |
| <b>Sustainable environment</b> | Content with sustainable development is not relevant to this course.   |                     |       |           |
| <b>Module</b>                  | 0010   | Written Examination | 5cr   | Grade: AF |
|                                | 0020   | Assignment Reports  | 2.5cr | Grade: AF |