



# FEK3150 Topics in Electromagnetic Interactions with Microsystems 3.0 credits

## Topics in Electromagnetic Interactions with Microsystems

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 FEK3150 valid from Spring 2019

## Grading scale

P, F

## Education cycle

Third cycle

## Specific prerequisites

Recommended:

MSc degree in electrical engineering, technical physics, or equivalent

- basic knowledge in microwave and/or photonics engineering
- basic knowledge in microsystem technology (such as the EK2350 Microsystem Technology Course at KTH, or equivalent)
- ongoing research activities within or related to electromagnetics and/or microsystems

# Language of instruction

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

## Intended learning outcomes

In the course of these meetings, the student will:

- have learned about the state of the art and research trends in research fields associated to his/her own research field
- have learned to get familiar with new problems related but not exactly within his research field, be able to assimilate new material quickly to reach a certain level of judgement
- have gained deeper understanding the theoretical background of wave propagation phenomena and interaction with microstructures
- have gained insight in modelling electromagnetic microstructures and in judging/questioning the simulation results
- have developed better understanding of the interdisciplinarity of associated fields: i.e. mutuality and differences between microwave systems and photonics engineering for different frequency ranges and applications
- have learned to present a certain topic to an audience which is not directly working on this topic but which is able to question the presented material
- have learned to give and to get feedback on presentations on topics related but not directly within his/her research field

## Course contents

The general objective of the course is to create a learning, but also information exchange and discussion forum for graduate students and researchers working with electromagnetic signals in microsystems, including microoptics, photonics, and microwave/RF MEMS. The goal of the course is for the participants to deepen their knowledge in these fields and to gain understanding by giving and listening to presentations and by discussing topics in this field. More specifically, electromagnetic problems with strong focus on the interdisciplinary nature of interactions of microwaves with micromachined geometries of feature sizes both larger and smaller than the signal wavelengths are handled at the different meetings of the course. Individual discussion topics span from theoretical analysis, simulation models, to device characterization and applications.

## Examination

- EXA1 - Examination, 3.0 credits, grading scale: P, 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.

## Other requirements for final grade

To get the full credits after a full academic year period, the student must:

1. be present on at least 80 % of the seminars
2. active participation by giving a certain number of presentations, determined by the course responsible at the beginning of each academic year (depending on the number of participants); the quality of the presentations and the preparation of the students will be judged by the course responsible
3. active participation by involvement in the discussions after the presentations; judged by the course responsible

The final grade for each student is determined by the active participation of the student in the course. As this is a PhD course the grading is either pass or fail.

## 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.