

EE-425

**HF and VHF circuits and techniques I**

Dehollain Catherine

Cursus	Sem.	Type
Electrical and Electronical Engineering	MA1, MA3	Opt.
MNIS	MA3	Opt.

Language of teaching	English
Credits	4
Session	Winter
Semester	Fall
Exam	Written
Workload	120h
Weeks	14
<b>Hours</b>	<b>4 weekly</b>
Courses	2 weekly
Exercises	2 weekly
<b>Number of positions</b>	

**Summary**

Master the design of circuits and systems at high frequency (HF) and very high frequency (VHF) (1 MHz-6GHz). This lecture is particularly oriented towards circuit aspects of modern communications systems.

**Content**

- 1) HF Passive Components
- 2) Resonant Circuits
- 3) Impedance Matching
- 4) HF Filters
- 5) Noise and Intermodulation
- 6) Modeling and Characterization of Transistors at HF
- 7) Design of HF Small-Signal Amplifiers

**Keywords**

HF and VHF wireless communication circuits  
RF wireless communication circuits

**Learning Prerequisites****Recommended courses**

Electronic circuits and systems I and II

**Learning Outcomes**

By the end of the course, the student must be able to:

- Design an electrical filter
- Model an amplifier
- Carry out the design of an impedance matching circuit
- Assess / Evaluate the noise figure of an amplifier
- Assess / Evaluate the quality factor of a passive impedance
- Assess / Evaluate the equivalent noise sources of an amplifier
- Assess / Evaluate the model of a transistor in HF and VHF
- Assess / Evaluate the properties of a resonant passive circuit

**Transversal skills**

- Access and evaluate appropriate sources of information.
- Assess one's own level of skill acquisition, and plan their on-going learning goals.
- Manage priorities.
- Set objectives and design an action plan to reach those objectives.
- Take feedback (critique) and respond in an appropriate manner.

### Teaching methods

Ex cathedra and exercices

### Assessment methods

Written

### Supervision

Office hours	Yes
Assistants	Yes
Forum	No

### Resources

#### Notes/Handbook

Polycopies and scientific articles.

#### Websites

- <http://rfic.epfl.ch>

#### Moodle Link

- <http://To be re-activated at the beginning of the semester>

#### Videos

- <http://No video>

### Prerequisite for

HF et VHF circuits and techniques II