

PHYS-114

**General physics: electromagnetism**

Shchutaska Lesya

Cursus	Sem.	Type
Communication systems	BA3	Obl.
Computer science	BA3	Opt.
HES - IC	H	Opt.

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

**Summary**

The course first develops the basic laws of electricity and magnetism and illustrates the use in understanding various electromagnetic phenomena.

**Content****ELECTRICITY AND MAGNETISM**

**Electric fields:** electric charges and fields; Coulomb's law; Gauss's law

**Electric potential and energy:** potential; energy; capacitance and capacitors; dielectric materials

**Magnetism:** magnetic forces and fields; Ampere's law; Biot-Savart law

**Electromagnetism:** electromotive force; Farady's law; inductance and inductors; Maxwell's equations

**Electromagnetic waves:** electromagnetic spectrum; antennas

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

General Physics I

**Learning Outcomes**

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

- Formulate approach for solving physics problems
- Analyze physical systems
- Establish competence in complex problem solving

**Transversal skills**

- Use a work methodology appropriate to the task.
- Take feedback (critique) and respond in an appropriate manner.
- Access and evaluate appropriate sources of information.

**Teaching methods**

Ex cathedra with demonstrations, exercises in class

**Assessment methods**

only final written exam

### **Supervision**

Assistants                      Yes

### **Resources**

#### **Moodle Link**

- <https://go.epfl.ch/PHYS-114>