

PHYS-200

**Physics III**

Dil Hugo

<b>Cursus</b>	<b>Sem.</b>	<b>Type</b>
Physics	BA3	Obl.

Language of teaching	English
Credits	6
Session	Winter
Semester	Fall
Exam	Written
Workload	180h
Weeks	14
<b>Hours</b>	<b>6 weekly</b>
Courses	4 weekly
Exercises	2 weekly
<b>Number of positions</b>	

**Summary**

The students understand and apply the physics of fluids, electromagnetism, and special relativity.

**Content****Physics of fluids**

Fluid kinematics, Navier-Stokes equation, perfect fluid dynamics, incompressible viscous fluid dynamics, eddies, flow stability, Reynolds number.

**Electromagnetism**

Electrostatics, electric field and potential; stationary electrical currents; magnetostatics; electric and magnetic fields in matter, polarization and magnetization, time-dependent electromagnetic field, Faraday's law; Maxwell's equations; electromagnetic energy, Poynting vector, Hertz dipole.

**Special relativity**

Michelson experiment, Einstein postulates, space-time interval, Lorentz transformation, four-vector, Minkowski space-time, velocity transformation, length contraction and duration expansion, relativistic particle dynamics.

**Learning Prerequisites****Required courses**

Physique I and II

**Learning Outcomes**

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

- Design a model of a physical phenomenon
- Formulate simplifying hypotheses of a model of a physical phenomenon
- Solve problems and applications of the treated material
- Critique the results of a model of a physical phenomenon
- Apply developed physical models to problem and application solving

**Teaching methods**

Ex cathedra and classroom exercises

**Assessment methods**

Written exam

**Supervision**

Office hours	Yes
Assistants	Yes
Forum	Yes

## Resources

### Bibliography

John Botsis & Michel Deville: Mécanique des Milieux Continus: Une Introduction  
Kip S. Thorne & Roger D. Blandford: Modern Classical Physics  
Francois A. Reuse: Electrodynamique  
Richard Phillips Feynman: The Feynman Lectures on Physics  
Paul A. Tipler & Ralph A. Llewellyn: Modern Physics

### Ressources en bibliothèque

- [John Botsis & Michel Deville: Mécanique des Milieux Continus: Une Introduction](#)
- [Kip S. Thorne & Roger D. Blandford: Modern Classical Physics](#)
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- [Richard Phillips Feynman: The Feynman Lectures on Physics](#)
- [Paul A. Tipler & Ralph A. Llewellyn: Modern Physics](#)

### Notes/Handbook

Various lecture notes

### Moodle Link

- <https://go.epfl.ch/PHYS-200>

### Prerequisite for

Physique IV