

Physics
Alma Mater Europaea University
Alma Mater Vienna

Course Name: Physics
Semester: Fall 2024
Intended for: Bachelor students
ECTS: 5
Language: English + German
Contact: physics@almamater.at

Course Description: The course covers fundamental physical concepts essential for understanding human physiology and their application in physiotherapy. The first part is general physics and covers topics such as Newton's Laws and motion, Conservation of energy and momentum, Gravitation, Electric charge in matter, Electric forces and fields, DC circuits, and Waves and sound. The first part includes the most advanced knowledge, methods and contents of self-paced edX courses including lectures with a combination of discussions and assignments. The second part covers physics of human body. It applies physical principles to the human body and therapeutic procedures. It includes work in study groups. Students meet the teacher weekly in live consultations and Q&A sessions.

Part 1: General Physics: Choose and complete either RICEx or DelftX+LTTx

[Rice University: Topics in AP Physics](#)

Described as 18 weeks, 60h total
Introductory

[Delft University: Pre-University Physics](#)

Described as 5 weeks, 35h total
Subtitles in German
Introductory

[Lufthansa: Physics Fundamentals](#)

(aviation physics)
Described as 3 weeks, 12h total
Introductory
Available only by 31 December 2024!

Alternatively, if you prefer to study in German, you can choose to study this book and take a regular exam in German (45 min, 6 short essay questions). Please let us know immediately if you choose this option:

Rufa, Gerhard. [Physik für Studierende der Biowissenschaften, Chemie und Medizin](#). Springer Spektrum, 2020.

Part 2: Physics of Human Body

In the book:
Harten, Ulrich. [Physik für Mediziner: Eine Einführung](#). Springer-Verlag, 11. Auflage.

study two chapters:
2 Mechanik starrer Körper, pp. 27-66.
3 Mechanik deformierbarer Körper, pp. 67-98.

and the Ohio University video: [Physics of the Human Body: Motion and Balance](#)

Weekly consultations: Between 25 November and 10 January, students meet the teacher weekly in live consultations (in German). For students, meetings are optional. To attend or book a consultation, email at latest 48h before the meeting with questions or topics you wish to discuss.

Grading: Grades will consist of edX points/grades, class participation and assignments, and a final exam.

Complete the selected edX courses by 12 Jan 2025. Missing the deadline results in a grade reduction by 1 (10%), and missing the deadline by 7 or more days results in a failing grade. In case of excusable reasons (health etc lasting more than 5 days), send an email to the address above.

edX points/grades (60% of grade)

The points/grades you receive on edX are calculated proportionally to 60%. You do not get additional points for completing more edX courses than what is included in one of the two options (either RICEX or DelftX+LTTx).

Class Participation and Assignments (10% of grade)

Lectures are included in edX and self-paced. There are no additional lectures. In Study Groups, you will:

-- Report on your progress in a few minutes

-- Report on a chosen narrow topic within the Unit 5 min. You should present some additional insight, an interesting study or whatever you think is relevant on this narrow topic based on your additional research.

-- Prepare 3 discussion questions and lead a discussion around 15 min.

In the beginning of the first meeting, each group selects a coordinator who manages the group in all its meetings, and a replacement coordinator who replaces the coordinator in case he/she is not present. The group may agree to appoint a new coordinator. The group manages itself and solves issues internally.

Students are expected to come to study groups prepared and ready to participate. Poor participation, unexcused absences, and consistent tardiness will lead to lost points for participation.

Final Examination (30% of grade)

The final examination will consist of 10 multiple choice and short answer questions on [exam.net](#). It will last 45 minutes. The final exam will be in German and on Part 2 only. You will complete Part 1 by completing edX courses.

Required Reading

Harten, Ulrich. [Physik für Mediziner: Eine Einführung](#). Springer-Verlag, 11. Auflage, Chapters 2 and 3.

Required Video

[Physics of the Human Body: Motion and Balance](#)

Optional Reading

Rufa, Gerhard. [Physik für Studierende der Biowissenschaften, Chemie und Medizin](#). Springer Spektrum, 2020.

Topics, Materials, and Assignments by Session

<i>Session</i>	<i>Date</i>	<i>Meeting or deadline</i>	<i>Material</i>	<i>Assignment</i>
1	14 November 2024		None	None
2	Week of 6 January 2025	Student group meeting Complete 50% of the selected edX course.	edX 50%	Report on your progress and a chosen topic 5 min, prepare 3 questions, lead a discussion 15 min.
3	12 January 2025	Deadline to Complete the selected edX course	edX	None
	16 January 2025	Final Exam - Part 2	exam.net	

Week of DATE means the week that starts on a Monday, DATE.

Version: Nov 2024