

科目ナンバリング		U-LAS12 10030 LE57							
授業科目名 <英訳>		Elementary Course of Physics B-E2 Elementary Course of Physics B-E2				担当者所属 職名・氏名		工学研究科 講師 Arseniy Aleksandrovich , Kuzmin	
群	自然科学科目群			分野(分類)	物理学(基礎)			使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義（対面授業科目）		
開講年度・ 開講期	2024・後期		曜時限	火2		配当学年	主として1回生	対象学生	理系向
【授業の概要・目的】									
<p>This course is oriented for those who did not learn physics in high school. This course follows the "Elementary Course of Physics A".</p> <p>This course aims to teach the basics of physics and its methods. Some mathematical constructs are introduced from a simple physical picture. This course consists of two main topics: Thermodynamics and Electrostatics.</p> <p>In Thermodynamics, ideas of heat, pressure, temperature, and order-disorder (entropy) are explained. For instance, some everyday experience, such as using an air conditioner, heating and cooling the air in the room, can be understood through thermodynamics.</p> <p>In Electricity, electric charges and their interaction is explained. Have you experienced static electricity when taking off a sweater? Probably yes, then you've experienced the interaction between electric charges. Charging a smartphone does involve a flow of electric charges. In this part for the course you will get familiar with such phenomena.</p>									
【到達目標】									
<p>Understanding of the main ideas in Thermodynamics and Electricity will give the listener the ability to make basic calculations and estimations of various phenomena surrounding us in the everyday life.</p> <p>The main goal is to introduce students to the scientific method and physical thinking.</p>									
【授業計画と内容】									
<p>The following topics are explained in this course:</p> <p>1. Introduction to temperature and heat.</p> <p>2. Heat conductance: why metals feel cool to touch, while plastics do not?</p> <p>3. Microscopic view on the gas parameters: pressure, temperature, density.</p> <p>5. How does order or disorder affects heat and temperature? Entropy and the second law of thermodynamics.</p> <p>6. Machines based on heating and cooling: understanding how air conditioner and fridge work.</p> <p>7. What is an electric charge?</p> <p>8. The force of the interaction of charges: Coulomb law.</p> <p>9. How to use vectors to explain interaction of charges: electric field.</p> <p>10. Gauss' law: how not to do difficult calculations, but get an idea about the electric field.</p> <p>11. Flow of charges: electric current.</p> <p>14 lectures in total and one feedback class.</p>									
-----Elementary Course of Physics B-E2(2)へ続く-----									

## Elementary Course of Physics B-E2(2)

### **[履修要件]**

This course is for those students who did not select physics as the entrance examination subject.

### **[成績評価の方法・観点]**

Evaluation will be based on:

10% attendance and participation

20% homework

20% quiz

50% final exam

### **[教科書]**

Halliday & Resnick 『Fundamentals of physics』 ( Wiley, 2014 ) ISBN: 978-1-118-23072-5

I. V. Savelyev 『Physics, a general course, volume 1』 ISBN:5-03-000900-0

I. V. Savelyev 『Physics, a general course, volume 2』 ISBN:5-03-000900-0

### **[授業外学修（予習・復習）等]**

Preparation for lectures will include revision of class materials and homework assignments. Detailed instructions will be given during the class.

### **[その他（オフィスアワー等）]**