

科目ナンバリング		U-LAS12 10003 LE57									
授業科目名 <英訳>		Fundamental Physics A-E2 Fundamental Physics A-E2				担当者所属 職名・氏名		医生物学研究所 助教 金 英寛			
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・前期		曜時限	水4		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】											
Focusing on classical mechanics, this lecture will introduce basic but important concepts in physics which are widely applied in other fields of natural sciences. Although prior knowledge of high school level physics will be advantageous, it is not absolutely necessary. Basic concepts and laws of classical mechanics will be introduced and expanded upon systematically.											
【到達目標】											
1) To understand basic concepts of Newtonian mechanics and how to apply them to various physical phenomena. 2) To nurture problem-solving skills in physics. 3) To develop abilities to relate classroom knowledge to observations in their daily physical phenomena.											
【授業計画と内容】											
In dealing with the following topics, particular attention will be given to their application in different fields of natural sciences and engineering.											
1) VECTORS AND KINEMATICS (3 weeks) We will learn about vector description of motion, and how to systematically derive differential equations (including kinematic equations) of motions.											
2) NEWTON'S LAWS OF MOTION (3 weeks) We will introduce Newton's laws of motion, the core of classical mechanics and the foundation of modern physics.											
3) LINEAR MOMENTUM (1 weeks) We will interpret Newton's second law from a different perspective based on a quantity called linear momentum. We will introduce a concept of conservation of linear momentum.											
3) WORK AND ENERGY (3 weeks) Building on our understanding of Newton's laws of motion, this chapter will dig deeper into important concepts such as work-energy theorem and conservation of energy.											
4) ROTATION AND ANGULAR MOMENTUM (2 weeks) We will explore rotational motion and angular momentum, which gives another perspective to Newton's second law. Here we will discuss concepts of conservation of angular momentum and rotational kinetic energy.											
5) GRAVITATION (2 weeks) The law of universal gravitation will be explained and applied to relevant dynamics in motion of celestial bodies.											
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## Fundamental Physics A-E2(2)

6) EXAM (1 week)

7) FEEDBACK (1 week)

### 【履修要件】

Knowledge of high school physics will be advantageous but not a requirement.

### 【成績評価の方法・観点】

Regular assignments:40%; End-term examination: 60%

### 【教科書】

使用しない

### 【参考書等】

（参考書）

David Halliday, Robert Resnick and Jearl Walker 『Fundamentals of Physics 12th Edition』 (Wiley)

If possible, please get a copy of the above textbook for your reference (not mandatory). It's such a nice book to study introductory physics.

### 【授業外学修（予習・復習）等】

Students are strongly encouraged to study introductory mathematics textbooks and other materials to ensure that they are comfortable with basic mathematical concepts such as calculus (differentiation and integration) which is useful for deriving equations of motion.

### 【その他（オフィスアワー等）】

Office hour will be announced during class.