

科目ナンバリング		U-LAS12 10026 LE57									
授業科目名 <英訳>		Physics for All-E2 Physics for All-E2				担当者所属 職名・氏名		工学研究科 講師 Tam Willy Nguyen			
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	2025・後期		曜時限	木2		配当学年	主として1・2年生	対象学生	文系向		
【授業の概要・目的】											
<p>Physics is the foundation of our understanding of the natural world. This course introduces the fundamental principles of mechanics and electrodynamics, emphasizing both intuitive understanding and mathematical reasoning. Designed for first-year students, including those from non-physics majors, it focuses on problem-solving skills and real-world applications.</p> <p>Through interactive lectures, practical examples, and mathematical exercises, students will develop a physicist's way of thinking, learning how to analyze and describe natural phenomena using physics.</p>											
【到達目標】											
<p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand fundamental principles of mechanics and electrodynamics and their role in everyday life. 2. Apply mathematical reasoning to describe and predict physical behavior. 3. Develop problem-solving skills to tackle unfamiliar physics problems systematically. 4. Recognize real-world applications of physics, from simple motions to advanced technologies. 											
【授業計画と内容】											
<p>Week 1: Introduction to Physics</p> <ul style="list-style-type: none"> - Course overview and expectations - The scientific method and its application in physics - Basic mathematical tools (algebra and trigonometry review) <p>Weeks 2-3: Kinematics</p> <ul style="list-style-type: none"> - Motion in one dimension: displacement, velocity, and acceleration - Motion in two dimensions: projectile motion - Utilizing vectors in physics <p>Weeks 4-5: Newton's Laws of Motion</p> <ul style="list-style-type: none"> - First, second, and third laws - Applications and problem-solving strategies - Friction, tension, and normal forces <p>Weeks 6-7: Work and Energy</p> <ul style="list-style-type: none"> - Work done by a force - Kinetic and potential energy - Conservation of energy principles <p>Weeks 8-9: Momentum and Collisions</p> <ul style="list-style-type: none"> - Linear momentum and impulse - Conservation of momentum 											
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Physics for All-E2(2)

- Elastic and inelastic collisions

Weeks 10-11: Rotational Motion

- Angular velocity and acceleration
- Torque and rotational dynamics
- Conservation of angular momentum

Weeks 12-13: Oscillations and Waves

- Simple harmonic motion
- Energy in oscillations
- Wave properties and types

Weeks 14-15: Electromagnetism Basics

- Electric forces and fields
- Basic circuits and Ohm's law
- Magnetic fields and forces

Week 16: Final Review and Examination

【履修要件】

Students should be familiar with high-school level mathematics, including algebra, basic calculus, and vectors. Prior experience with physics in high school is helpful but not required. The course will introduce concepts step by step to accommodate students with varying backgrounds.

【成績評価の方法・観点】

Assignments will be given regularly to assess students' understanding of lecture content.

Evaluation:

- Assignments: 40%
- Final Exam: 50%
- Class Participation: 10% (includes attending lectures, engaging in discussions, and contributing to problem-solving activities, either individually or in small groups). Active listening and thoughtful questions are also valued.

Students need at least 60% in total to pass the course.

【教科書】

H.D. Young and R.A. Freedman 『University Physics with Modern Physics, 15th Edition』 (Pearson)
ISBN:978 (0135159552)

【授業外学修（予習・復習）等】

- Assignments will be given weekly, reinforcing key concepts and problem-solving techniques.
- Students are expected to review lecture notes and attempt practice problems before the next class.
- Reading relevant textbook sections in advance is recommended to enhance understanding and class engagement.
- Preparing for the final exam will require consistent revision throughout the course.

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[その他（オフィスアワー等）]