Fundamentals of Physics I

Undergraduate / Graduate	Undergraduate	**Registration Code**	0062211
Course Category	Basic Courses in Natural Sciences	**Credits**	2.0
Term (Semester) / Day / Period	G-I（1st year, Fall Semester) / Tue / 2（10:30～12:00）		
Instructor	SHIGEMORI Masaki		
Contact e-mail of the Instructor	shigemori.masaki.b9@f.mail.nagoya-u.ac.jp		

●Goals of the Course

This is the first of three lecture courses (Fundamentals of Physics I–III) designed to cover the basic classical physics to provide a firm foundation for learning science and engineering, and is offered to undergraduate students in their first year. This course introduces the concepts and laws of classical mechanics. Specifically, the lecture covers various concepts such as Newton's second law, force, work, kinetic and potential energy, conservation of energy, center of mass and linear momentum. Basic physical and mathematical concepts such as velocity, acceleration, vectors, differentiation and integration are also reviewed.

●Objectives of the Course

Kinematics: Understand how to describe motion using position, velocity and acceleration vectors.
Dynamics: Understand Newton's laws and learn how to solve dynamical problems using free-body diagrams.
Understand basic notions such as work, energy, momentum, and conservation of energy and momentum.

●Course Contents or Plan

The topics include kinematics, vectors, force and motion, energy, work and momentum, and are based on the following chapters in the textbook:

Chapter 2: Motion Along a Straight Line
Chapter 3: Vectors
Chapter 4: Motion in Two and Three Dimensions
Chapter 5: Force and Motion I
Chapter 6: Force and Motion II
Chapter 7: Kinetic Energy and Work
Chapter 8: Potential Energy and Conservation of Energy
Chapter 9: Center of Mass and Linear Momentum

Some examples of problem solving will be discussed in lectures, but the companion course, Fundamental Physics Tutorial Ia, is designed to develop students' problem-solving skills.

●Course Prerequisites and Related Courses

Students without a good background in high school physics and basic calculus are advised to review those materials as soon as possible and would be expected to spend more time and effort for the course. This must be considered when deciding your course load. Students are expected to participate actively in class activities throughout the course.

●Course Evaluation Method and Criteria

Class attendance is required. Absentees must give a valid reason (e.g. doctor's certificate). Students who withdraw from this course must notify the instructor in charge in a written form (email, NUCT, etc).
Class attendance: 5%, Assignments: 25%, Exams (midterm and final): 70%.

●Study Load (Self-directed Learning Outside Course Hours)

Online-quizzes and homework (a few hours)

●How to Respond to Questions

Online Q&A and email

●Notice for students

Concurrent registration of Fundamental Physics Tutorial Ia is strongly advised because it is necessary for mastering the content of the lectures.

Textbook	**Fundamentals of Physics** Extended 11th Edition International Student Version with **WileyPLUS Set** (John Wiley & Sons, 2018 ISBN: 978-1119460138)
Reference Book	Feynman Lectures On Physics (Vol.1) by Richard P. Feynman (Pearson PTR)
Reference website for this Course	