KUOCW 참여강의 개요

※ 실제로 진행될 강의에 대한 개요입니다.

1. 교과목 개요

교과목명(국문)	고전역학
[선택] 교과목명 (영문)	Classical Mechanics
교수자명	유종훈
교과목 학습목표	The purpose of this course has the following basic purposes: (1) To present a treatment of classical mechanical systems. (2) To acquaint the student with new mathematical techniques in solving problems of classical mechanical systems. (3) To provide a new tool handing "big data" for the students' career.
교과목 소개	Classical mechanics, together with classical electrodynamics and quantum mechanics, forms the core of present day theoretical training for undergraduate students. This course is the first class of an introduction to classical mechanics essential to understand most fields of physics. Classical mechanics is the study of the motion of relatively large bodies in accordance with the general principles widely known as Newtonian mechanics. It has many important applications in the areas of astronomy, chemistry, biology, geology, and engineering. It describes the formation of the universe, the orbit of satellites, molecular collisions, stability of structures, dynamics of nonlinear systems, and etc. The success in understanding this course is not only to work problems that exercise the principles but also to practice numerically the mechanical systems. It includes the dynamics of a particle, the harmonic oscillator, nonlinear oscillations, chaos, and gravitation. Therefore, three or four problems at the end of each chapter are assigned to the homework every week. And one or two numerical calculations are given to practice the principles every week. In particular, we use the program of MATLAB to compute the problems in classical mechanics. The technical computing environment of MATLAB now provides an opportunity to easily solve realistic and more complicated problems. The following website is useful: MATLAB: http://www.mathworks.com
교과목 키워드	Classical Mechanics, Newtonian Mechanics, Non-modern Physics

2. 주차별 강의 내용 및 연관 파일명

주차	주제	내용 요약	해당 주차의 강의자료 파일명
1	Ch 1 Matrices, Vectors, and Vector Calculus 1	Introducton to vectors and vector calculus.	Lecture 1
2	Ch 1 Matrices, Vectors, and Vector Calculus 1	Introduction to MATLAB Programming	Lecture 2
3	Ch 2 Newtonian Mechanics	Newton's Laws	Lecture 3
4	Ch 2 Newtonian Mechanics	The equation of Motion for a particle	Lecture 4

5	Ch 2 Newtonian Mechanics	Energy	Lecture 5
6	Ch 3 Oscillations	Simple Harmonic Oscillator	Lecture 6
7	Ch 3 Oscillations	Damped Oscillations	Lecture 7
8	Mid-term Exam		
9	Ch 3 Oscillations	Oscillations by MATLAB Programming	Lecture 8
10	Ch 4 Nonlinear Oscillations and Chaos	Nonlinear Oscillations	Lecture 9
11	Ch 4 Nonlinear Oscillations and Chaos	Chaos	Lecture 10
12	Ch 4 Nonlinear Oscillations and Chaos	Nonlinear Oscillations by MATLAB Programming	Lecture 11
13	Ch 5 Gravitation	Gravitational Potential	Lecture 12
14	Ch 5 Gravitation	Ocean Tides	Lecture 13
15	Ch 5 Gravitation	Gravitation by MATLAB Programming	Lecture 14
16	Ch 6 Euler's Equation	Methods in the Calculus of Variations	Lecture 15