

Syllabus Spring 2020

Introduction to Physics

Course description. Introduction to key concepts of classical mechanics: dimensions and units, Newton's laws of motion and gravitation, particle trajectories in Euclidean space, and conservation laws of energy and (linear and angular) momentum. Selected topics include examples from fluid dynamics and wave motion, the pendulum, scaling and dimensional analysis and elements of thermodynamics.

Professor: Maurice H.P.M. van Putten

Coordinates: 3B02, MO and WE 10:30-12:00 hr

References: Lecture notes are provided on www.mvputten.org. Additional references are: *College Physics* – Volume 1, by A. Giambattista, B. Richardson and C. Richardson, 2012, (McGraw-Hill); *College Physics* – Brief Edition (Korean), A. Giambattista, B. Richardson and C. Richardson, 2005, (McGraw-Hill; Sejong University Bookstore), **Ch. 1-16**; and *Feynman Lectures of Physics*, Volume 1, www.feynmanlectures.caltech.edu, **Ch. 4-6, 8-11, 18-23, 39-46, 50-51**.

Contents

- I. Introduction**
- II. Classical Mechanics**
- III. Classical Mechanics**
- IV. Exponential function and complex numbers**
- V. Matter and motion**
- VI. Many particles**
- VII. Many particles**
- VIII. Entropy and heat**
- IX. Random walks**
- X. Entropy and forces**
- XI. Angular momentum**
- XII. Wave motion**
- XIII. Traffic flows**
- XIV. Colors and light**
- XV. Reflection and refraction**
- XVI. Black body radiation**

Homework. Provided in class

Grading. Based on class attendance, homework, mid-term, final.