

<b>Course name</b>	Physics 105, Classical Mechanics
<b>Meeting place, time</b>	Physical Sciences 110, TuTh 10:00AM-11:45AM
<b>Instructor</b>	G. (Sam) Gweon (gweon@ucsc.edu)
<b>Office hours</b>	Mo 3-4PM, Tu 3-4PM
<b>Instructor office</b>	ISB 249; more info at <a href="http://gweon.com">http://gweon.com</a>
<b>Teaching assistant</b>	Stephen Martin (stelmart@ucsc.edu)
<b>TA discussion sections</b>	Tu 6-7:10PM (NA 101), We 2-3:10PM (PSB 136)
<b>TA office</b>	ISB 262, 9-5010
<b>Textbook</b>	<i>No textbook required.</i>
<b>References</b>	<i>Classical Mechanics</i> , R. Douglas Gregory <i>Classical Dynamics of Particles and Systems</i> Thornton and Marion (5th ed) <i>Mechanics</i> , Landau and Lifshitz <i>The Feynman Lectures on Physics</i> , volume 1 Feynman, Leighton, and Sands
<b>Course website</b>	<a href="http://gweon.com/teaching/current">http://gweon.com/teaching/current</a>

**Course objectives** Gain solid understanding of classical mechanics (Newton's laws, Lagrangian mechanics, conservation principles, oscillations and waves, gravitation, central force, scattering, rigid body). Establish firm physics and math foundation on which to build your great career.

**How you can achieve them.** Work hard (read, listen, ask, think hard). Believe that *you are the one*.

**Prerequisite** 5A/L, 5B/M, 5C/N, 116A-B, or equivalent. Math we will use: calculus, vectors, matrices, tensors, linear algebra, ordinary differential equations, Fourier series, Fourier integrals.

**Evaluation** Roughly, homework (30 %), midterm (30 %), final (30 %), quiz (10 %). Homework will be handed out on Thursdays, and will be due about one week later. Late homework will not be accepted (but see next). Every Thursday, except for the first two Thursdays, there will be in-class quiz on materials related to the last homework.

**Emergency** If highly unusual personal circumstances arise to prevent you from participating in core course activities, you should communicate with me as soon as you can, so that you will get the best consideration for makeup opportunities.

**Get all help you can get.** My office hours. TA discussion sections. Study sessions with your friends. Course web site. The evaluation will be absolute, and so help your friend understand things better – you've got nothing to lose. If your classmate asks you a question, by all means give an earnest answer. You will not only help the classmate, but you will help yourself by thinking harder, clearing

up confusion, and solidifying knowledge. By the same token, don't be shy to ask your classmate a question. You are very likely be helping her/him too!

**However . . .** you should never help, or be helped by, your friends during an exam or a quiz. You should never copy your friend's homework solution. Likewise, you should never engage in other activities that breach the academic integrity. To ensure fairness, I will be monitoring possible activities breaching the academic integrity. If confirmed to be involved in such an activity, you will fail this course.

**Lecture plan** The following table is a rough plan for lectures. Changes may occur as we go along. Check the course web site for lecture notes<sup>1</sup>.

Lecture	Week	Date	Subject
1	1	10 / 2	Introduction (Vectors, Perturbation)
2	2	10 / 7	Newton's laws
3	2	10 / 9	Air resistance, Perturbation
4	3	10 / 14	Lorentz force
5	3	10 / 16	Conservations, Motion in 1D
6	4	10 / 21	Small oscillations
7	4	10 / 23	Driven oscillations
8	5	10 / 28	Lagrangian dynamics
9	5	10 / 30	Symmetry and conservation, Hamiltonian
Exam	6	11 / 4	—Midterm—
10	6	11 / 6	Hamiltonian dynamics, Constraints
11	7	11 / 13	Gravity
12	8	11 / 18	Gravity, Central force problem
13	8	11 / 20	Central force problem, Many particles
14	9	11 / 25	Many particles, Scattering
15	10	12 / 2	Coupled Oscillations
16	10	12 / 4	Coupled Oscillations
17	11	12 / 9	Coupled oscillations, Rigid body
18	11	12 / 11	Non-linearity, Chaos
Exam	12	12 / 15	Final exam (12–3PM)

<sup>1</sup>Some of you may remember my server address as “griffin.ucsc.edu.” That address is being phased out, but it is still functional—it just re-directs automatically to “gweon.com.”