Course name	Physics 105, Classical mechanics
Meeting place, time	Physical Sciences 110, TuTh 10:00AM-11:45AM
Instructor	G.-H. (Sam) Gweon
Office hours	**MoWe 11AM-12PM, Tu 4PM-5PM**, OBA
Instructor coordinates	ISB 249, gweon@ucsc.edu, http://griffin.ucsc.edu
Teaching assistant	Alice Durand
TA discussion place, time	Nat Sci Annex 101, Wed 5:15-6:30PM
TA office hour	**Fr 3-4PM, ISB 262**
TA coordinates	ISB 262, amdurand42@gmail.com, 9-5010
Textbook	*Classical Dynamics of Particles and Systems* Thornton and Marion, fifth edition
References	*The Feynman Lectures on Physics, volume 1* Feynman, Leighton, and Sands *Mechanics* Landau and Lifshitz
Course website	http://griffin.ucsc.edu/teaching/current

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. Some changes are likely to occur as we go along.

Lectures, while based on textbook topics, may differ greatly from, and supersede, the textbook.

L	W	D	Subject	Topics for lecture; read before lecture	Basic, assumed known; read	Optional; read if you can
1	1	9-22	Vectors and Newton's laws	C1 (some), C2 (p48-63)	C1, p55-58	
2	2	9-27	Perturbation, Newton's laws	C2 (p63-69, p73-87)	p71-73	p69-71, p88-90
3	2	9-29	Oscillations	C3 (p99-117)		
4	3	10-4	Oscillations	C3 (p117-137)		
5	3	10-6	Non-linear oscillations and chaos	C4 (p144-160, p169-178)		p160-169
6	4	10-11	Gravitation	C5 (p182-198)		p198-204
7	4	10-13	Calculus of variation, Hamilton's principle	C6 (p207-225), C7(p228-233)		
8	5	10-18	Lagrangian dynamics	C7 (p233-254)	p254-258	
9	5	10-20	Conservation principles, Hamiltonian dynamics	C7 (p258-280)	p254-258	
10	6	10-25	Central force problem	C8 (p287-308)		p308-316
11	6	10-27	– Midterm –			
12	7	11-1	System of particles	C9 (p339-355, p358-362)	p356-358	
13	7	11-3	System of particles	C9 (p363-378)		
14	8	11-8	Non-inertial frame	C10		
15	8	11-10	Rigid bodies	C11 (p415-454)	p411-415	p454-460
16	9	11-15	Rigid bodies, Coupled oscillations	C11, C12		
17	9	11-17	Coupled oscillations	C12		p498-507
18	10	11-22	Coupled oscillations	C12		p498-507
19	11	11-29	Wave equation	C13		
20	11	12-1	– Catchup, Review –			