

Physics 711: Fall Semester, 2008

Instructor: L. Bruch

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Office hours: MW 9:30-10:45 AM and by appointment

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Lecture notes at <http://uw.physics.wisc.edu/~bruch>

Class meets: 11:0 AM; 2223 Chamberlin

Texts: A. L. Fetter and J. D. Walecka, "Theoretical Mechanics;" L. D. Landau and E. M. Lifshitz, "Mechanics"

Problem assignments are due on Mondays and will be discussed the following Wednesday. You are free to collaborate on solving the problems, but in such cases each student should write up the solution separately.

Grades will be calculated on the basis of an Hour exam (midterm) (25%), the final exam (35%), a required project (15%) and problem sets (25%).

Library materials: Problem solutions will be posted via the Physics Library Reserves page (4220 Chamberlin) on Wednesdays. Other materials on reserve include:

A. L. Fetter and J. D. Walecka, "Theoretical Mechanics"

L. D. Landau and E. M. Lifshitz, "Mechanics"

V. D. Barger and M. G. Olsson, "Classical Mechanics"

H. Goldstein, C. Poole, and J. Safko, "Classical mechanics"

P. G. Bergmann, "Introduction to the theory of relativity"

B. F. Schutz, "A first course in general relativity"

J. V. José and E. J. Saletan, "Classical Dynamics: A Contemporary Approach"

S. Weinberg, "Gravitation and Cosmology"

L. D. Landau and E. M. Lifshitz, "Fluid Mechanics"

Assignments and Exams

[P] denotes that an additional problem not from the text.
September 15: Set I, Central forces. Chap. I #2, 5, 7, 13, 18
September 22: Set II, Rotations. Chap. II #1a, 3, 4, 6
September 29: Set III, Lagrange. Chap. III #1, 3, 6. [P]
October 6: Set IV, Lagrange. Chap. III #8, 12, 18, [P]
October 13: Set V, Oscillators. Chap IV # 1, 2, 6, 7, [P]
October 20: Hour exam
November 3: Set VI, Euler
November 10: Set VII, Hamiltonian
November 24: Set VIII, Continua
December 8: Set IX, Relativity
December 12: [projects]
FINAL EXAM Monday December 15, 2:45 PM

Lecture topics: [FW denotes text Fetter & Walecka, LL= Landa & Lifshitz, G = Goldstein, Poole & Safko]

	Date	topic	text sections
1	W Sep 3	Introduction	FW 1.1
2	F Sep 5	Cons. laws I	FW 1.2, LL 6-7
3	M Sep 8	Central force I	FW 1.3, G 3.6
4	W Sep 10	Kepler	FW 1.3, LL 15, G 3.6
5	F Sep 12	Central force II	FW 1.4, 1.5 LL 13
6	M Sep 15	Scattering	FW 1.5 LL 17-19
7	W Sep 17	Rotations I	FW 2.6, 2.7
8	F Sep 19	Rotations II	FW 2.8 - 2.10
9	M Sep 22	Rotations III	FW 2.11 LL 39
10	W Sep 24	Lagrange I	FW 3.13 - 3.15
11	F Sep 26	Lagrange II	FW 3.15, 3.16
12	M Sep 29	Variations	FW 3.17, 3.18
13	W Oct 1	Constraint forces	FW 3.19
14	F Oct 3	Cons. laws II	FW 3.20
15	M Oct 6	Small oscillations	FW 4.21, 4.22 LL 21,22
16	W Oct 8	Normal modes	FW 4.22
17	F Oct 10	Exs.	4.23, 4.24
18	M Oct 13	Contin. limit I	FW 4.24, 4.25
19	W Oct 15	Contin. limit II	FW 4.25
20	F Oct 17	open	

	Date	topic	text sections
21	M Oct 20	exam	
22	W Oct 22	Rigid body	FW 5.26, LL 31-36
23	F Oct 24	Euler I	FW 5.26, 5.27
24	M Oct 27	Exs.	FW 5.28
25	W Oct 29	Euler II	FW 5.29, 5.30
26	F Oct 31	Hamilton I	FW 6.32
27	M Nov 3	Hamilton II	FW 6.33
28	W Nov 5	Action	FW 6.34, 6.35 LL 45
29	F Nov 7	Strings I	FW 7.38, 7.39 H 150-153
30	M Nov 10	Strings II	FW 7.40
31	W Nov 12	Membranes I	FW 7.46, 7.47
32	F Nov 14	Membranes II.	FW 7.47
33	M Nov 17	Hydrodynamics I	FW 7.48
34	W Nov 19	Hydrodynamics II	FW 7.48, 7.49
35	F Nov 21	Relativity	
36	M Nov 24	Lorentz	
37	W Nov 26	Lorentz mechanics	
38	M Dec 1	Lorentz waves	
39	W Dec 3	Lorentz e-m	
40	F Dec 5	Collisions	
41	M Dec 8	Chaos I	
42	W Dec 10	Chaos II	
43	F Dec 12	Chaos III	
	M Dec 15	Final exam 2:45 PM	