

COURSE OUTLINE FOR PHYS 709 (CLASSICAL MECHANICS)

INSTRUCTOR:	Emanuele Berti
OFFICE:	205 Lewis Hall
CLASS SCHEDULE:	Tue & Thu 9:30am-10:45am, Lewis Room 104 (Tutoring Lab)
OFFICE HOURS:	By appointment
EMAIL:	eberti [at] olemiss.edu
COURSE WEBSITE:	http://www.phy.olemiss.edu/~berti/teaching/
PHONE:	662-915-1941

PREREQUISITE:	GRADUATE STATUS
COURSE CREDIT HOURS:	3

TEXTBOOK:

- 1) *Theoretical Mechanics of Particles and Continua*
by Alexander L. Fetter and John Dirk Walecka
- 2) *Advanced Mechanics* Lecture Notes
by Eric Poisson, available at
<http://www.physics.uoguelph.ca/poisson/research/mech.pdf>

OTHER USEFUL BOOKS:

- 3) *Classical Mechanics (3rd Edition)*
by Herbert Goldstein, Charles P. Poole Jr. and John L. Safko
- 4) *Classical Dynamics of Particles and Systems*
by Stephen T. Thornton and Jerry B. Marion

The main textbooks for the course are *Theoretical Mechanics of Particles and Continua* by Fetter and Walecka and the *Advanced Mechanics* Lecture Notes by Eric Poisson. Another useful reference is the classic text by Goldstein. In class I may point to other books for a more advanced treatment of certain topics and complementary material.

COURSE GOALS AND LEARNING OUTCOME:

A significant goal of this course is to advance the students' mathematical tool kit and analytical reasoning. Solving homework problems by applying the right mathematical methods is important, but students will be evaluated on a broader set of skills, including their ability to analyze a problem and place it in context, as well as their presentation and writing skills. In order to take full advantage of the lectures, students should read the relevant sections of the textbooks both before and after each lecture.

PRELIMINARY OUTLINE OF THE COURSE:

This is a standard "core" course in the graduate physics curriculum. We will learn advanced methods to study the dynamics of particles, systems of particles and extended bodies, including in particular the Lagrangian and Hamiltonian methods, that are used in several other areas of modern physics. We will cover (roughly speaking) chapters 1–6 of Fetter and Walecka, complementing their treatment with material from Poisson's lecture notes and the other recommended textbooks.

EVALUATION:

GRADE TYPE: Letter Grade (A–F)

GRADE RANGES:

- A: 88% and up
- B: 75-87%
- C: 60-74%
- D: 40-59%
- F: less than 40%

GRADE PERCENTAGE: 60% Homework
10% Mid-term
30% Final exam

HOMEWORK, IN-CLASS TESTS AND FINAL EXAM:

Homework assignments will be announced in class, and **they must be turned in at the beginning of class on the due date. Late homework will not be accepted.** In exceptional cases students may be excused from turning in an assignment. Homework must be easy to read: please write down clearly your name and the problem set number, do not use a red pen, write consistently on either one side or both sides of the paper and staple the pages together. The final exam is open-book and will consist of problems to be worked out in class. Students will be allowed to use a calculator, and may be provided with an equation sheet by the instructor if necessary.

ATTENDANCE:

There is no strict attendance requirement, but you are strongly advised to attend class. If you miss an exam or cannot turn in homework, please inform me beforehand and get a doctor's note if applicable. Absences from tests count as zeros, unless they are justified. If you must be absent during a test for a University sponsored event, you must discuss this with me before the test date.

ACADEMIC INTEGRITY:

Violations of the University's policy of academic integrity will result in a failing grade and other disciplinary actions. A student with a documented case of plagiarism or cheating in this course will receive a failing grade for the course and may face disciplinary action by the University, including expulsion.

NOTE:

If a change in the syllabus becomes necessary during the semester, it will be discussed in class and then posted on the course website. The course website will also contain up-to-date information on the class schedule, homework assignments and complementary material.