

# PHYS 3342 MECHANICS Fall 2009

Lecture CRN: 12035 8:00am–8:50am MWF LSC 114

## Instructor

**Scott Austin**

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Office hours: M W F 9:00am–9:50am and 11:00am–12:00pm

## Course Description

General Principles of classical mechanics with an introduction to Hamilton's principle, Lagrange's equation, and the Hamilton–Jacobi equation. Lecture. Prerequisite: PHYS 1441 (UP I) or PHYS 1410 (College Physics I) and MATH 3321 (Calculus III), MATH 3331 (ODEs).

## Textbook(s)

Required textbook: Fowles & Cassiday "Analytical Mechanics", 7th ed.

This is the book we will be following and from which I will be assigning some of the problems. Most textbooks have certain strengths and weaknesses, Therefore for your own personal library of reference text books you may want to obtain one or more of the following.

Some suggested reference texts (in no particular order):

- Taylor "Classical Mechanics"
- Barger & Olsson "Classical Mechanics A Modern Perspective", 2nd ed.
- Thorton and Marion "Classical Dynamics of Particles and Systems"

## Course Format

### Homework

You will create a portfolio of the solutions to the assigned problems.

### Class time

Class time will be spent on short lectures and actively working problems both in groups and individually.

### Assessment

- Homework: Problems sets will be assigned and collected for assessment periodically. 25% of your grade.
- Quizzes will be given at a rate of about one a week and will account for 25% of your grade.
- Semester Exams: Three exams will be given during the semester and will be 25% of your grade.
- Final Exam (Monday Dec 7 8am–10am): A comprehensive final exam will be worth 25% of your grade.

## Grades

### Starting Grade Scale

$90\% \leq A \leq 100\%$

$80\% \leq B < 90\%$

$70\% \leq C < 80\%$

$60\% \leq D < 70\%$

$0\% \leq F < 60\%$

## Absences

All quizzes and exams must be done during the scheduled times.

Consideration will be given for the following at the convenience of the instructor:

- Any student who is required to participate in off-campus, university-sponsored activities such as field trips, musical performances, judging teams, intercollegiate athletic events, etc. must obtain a letter from the faculty or staff member supervising the off-campus activity. The letter must contain specific information concerning the activity and date, be signed by the supervising faculty or staff member, and be submitted by the student to me at least one week in advance.
- Students that must miss a class because of illness, personal crises, mandated court appearances, parental responsibilities, and the like are required to submit a written explanation of the absence at least one week in advance. For emergency situations, students are required to call or e-mail me immediately followed by a written explanation.
- If one cannot come to class because of inclement weather one must call or e-mail me immediately.
- Students who attempt to gain advantage through abuse of this policy (e.g., by providing an instructor with false information) will receive disciplinary action and will fail this course.

## Academic Misconduct

Academic misconduct include cheating, falsification, multiple submission, plagiarism, abuse of academic materials, and complicity or misconduct in research; the definition of academic misconduct is stated in the Student Handbook. Any student guilty of an act of academic misconduct will be subjected to one or more of the following penalties as outlined in the Student Handbook: 1. The students' grade in the course or on the examination or assignment affected by the misconduct may be reduced to an extent, including reduction to failure. 2. The student may be placed on probation or suspended from the university for a specific period of time. 3. The student may be expelled from the university. Expect to receive the maximum penalty for any academic misconduct.

## Misc Policies

All other policies not explicitly covered in the syllabus can be found in the Student Handbook. For example, academic policies in general can be found beginning on page 26 and the sexual harassment policy can be found on page 93.

## Americans with Disabilities Act

UCA adheres to the requirements of the Americans with Disabilities Act. If you need accommodation under this Act contact the UCA Office of Disability Services at 450-3135.

## Schedule

DATE	TOPICS	
Aug 21, 2009	Pre-course evaluations and syllabus	
Aug 24, 2009	Pre-course evaluation	
Aug 26, 2009	Rectilinear Motion	Ch 2
Aug 28, 2009	Rectilinear Motion	Ch 2
Aug 31, 2009	Rectilinear Motion	Ch 2
Sep 2, 2009	Oscillations	Ch 3
Sep 4, 2009	Oscillations	Ch 3
Sep 9, 2009	Oscillations	Ch 3
Sep 11, 2009	Oscillations	Ch 3
Sep 14, 2009	Oscillations	Ch 3
Sep 16, 2009	Motion in 3D	Ch 4
Sep 18, 2009	Motion in 3D	Ch 4
Sep 21, 2009	Motion in 3D	Ch 4
Sep 23, 2009	<b>Exam 1</b>	Ch 2 - 4
Sep 25, 2009	Gravitation and Central Forces	Ch 6
Sep 28, 2009	Gravitation and Central Forces	Ch 6
Sep 30, 2009	Gravitation and Central Forces	Ch 6
Oct 2, 2009	Gravitation and Central Forces	Ch 6
Oct 5, 2009	Gravitation and Central Forces	Ch 6
Oct 7, 2009	Gravitation and Central Forces	Ch 6
Oct 9, 2009	Dynamics of System of Particles	Ch 7
Oct 12, 2009	Dynamics of System of Particles	Ch 7
Oct 14, 2009	Dynamics of System of Particles	Ch 7

DATE	TOPICS	
Oct 19, 2009	Dynamics of System of Particles	Ch 7
Oct 21, 2009	Dynamics of System of Particles	Ch 7
Oct 23, 2009	<b>Exam 2</b>	Ch 6 - 7
Oct 26, 2009	Lagrangian Mechanics	Ch 10
Oct 28, 2009	Lagrangian Mechanics	Ch 10
Oct 30, 2009	Lagrangian Mechanics	Ch 10
Nov 2, 2009	Lagrangian Mechanics	Ch 10
Nov 4, 2009	Lagrangian Mechanics	Ch 10
Nov 6, 2009	Lagrangian Mechanics	Ch 10
Nov 9, 2009	Lagrangian Mechanics	Ch 10
Nov 11, 2009	Lagrangian Mechanics	Ch 10
Nov 13, 2009	<b>Exam 3</b>	Ch 10
Nov 16, 2009	Dynamics of Oscillation Systems	Ch 11
Nov 18, 2009	Dynamics of Oscillation Systems	Ch 11
Nov 20, 2009	Dynamics of Oscillation Systems	Ch 11
Nov 23, 2009	Dynamics of Oscillation Systems	Ch 11
Nov 30, 2009	Dynamics of Oscillation Systems	Ch 11
Dec 2, 2009	Dynamics of Oscillation Systems	Ch 11
Dec 7, 2009	<b>Final Exam 8am-10am</b>	Comprehensive