PHYS 4222 Classical Mechanics II

Contact Information

Instructor: Dr. Yuri Nesmelov
Office: 269 Bioinformatics Building
Phone: 75886
Email: Yuri.Nesmelov@uncc.edu

Course Information

The course meets in Grigg 131 on Tuesdays and Thursdays 11:00am-12:15pm.

Office Hours

Contact me anytime you have questions. Office hours are by appointment.

Required Text

Classical Mechanics, by John R. Taylor (University Science Books)

Grading

Two tests, each worth 20%	total tests 40%
Final exam 30%	total final exam 30%
Six home works, each worth 5%	total home work 30%

Course Policy

Grades are assigned using a 100-point grading scale:
A = 90.0-100.0, B = 80.0-89.9, C = 70.0-79.9, D = 50.0-69.9.
Late assignments will not be accepted.
Grades will not be adjusted in any way. Your actual score on your tests and homework will be reflected in your final grade.

Expectations for Tests

The tests are closed book and closed notes.

Homework

Home work is due in class on the day specified in the schedule. No late homework will be accepted.

Academic Integrity

Students have the responsibility to know and observe the requirements of The UNCC Code of Student Academic Integrity (see Catalog or see http://www.legal.uncc.edu/policies/ps-105.html). This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. Any special requirements or permission regarding academic integrity in this course will be stated by the instructor, and are binding on the students. Academic evaluations in this

course include a judgment that the student's work is free from academic dishonesty of any type; and grades in this course therefore should be and will be adversely affected for academic dishonesty. Students who violate the code can be expelled from UNCC. The normal penalty for a first offense is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases the course grade is reduced to F. Students are expected to report cases of academic dishonesty to the course instructor.

If you have a disability that qualifies you for academic accommodations, please provide a letter of accommodation from Disability Services in the beginning of the semester. For more information regarding accommodations, please contact the Office of Disability Services at 704-687-4355 or stop by their office in 230 Fretwell

Course topics

Chapter	Topics	Reading assignment	HW due
7. Lagrange's Equations	Lagrange's equation for unconstrained motion	7.1	
	constrained systems	7.2 – 7.4	
	examples of Lagrange's equations	7.5	
	Lagrange multipliers	7.10	
Ch 8. Two-body Central-Force Problems	center-of-mass coordinate, reduced mass	8.1 – 8.2	HW1
	equation of motion	8.3 – 8.5	
	bounded Kepler orbits	8.5 – 8.6	
	unbounded Kepler orbits	8.7 - 8.8	
Ch 9. Mechanics in Nonlinear Frames	inertial force	9.1 – 9.2	HW2
	angular velocity and acceleration	9.3 – 9.4	
	motion in a rotational frame	9.6 -.9.7	
	centrifugal and Coriolis force	9.8 – 9.10	
Test1			HW3
Ch 10. Rotational Motion of Rigid Bodies	center of mass and rotation	10.1 – 10.2	
	inertia tensor and principle axes	10.3 – 10.5	
	precession	10.6	
	Euler's equations	10.7 – 10.8	
	Euler's angle and motion of a spinning top	10.9 – 10.10	
Ch 11. Coupled Oscillators and Normal Modes	coupled simple harmonic oscillators	11.1 – 11.3	HW4
	general formalism of coupled oscillators	11.5	
	Lagrangian approach and coupled pendulums	11.4, 11.6	
	normal modes and normal coordinates	11.7	
Test 2			HW5

Ch13. Hamiltonian Mechanics	Hamiltonian	13.1 – 13.2	
	Hamilton's equations	13.3 – 13.5	
	phase-space orbits	13.6	
	Liouville's theorem	13.7	
Ch 16. Continuum Mechanics	wave equations and waves	16.1 – 16.2, 16.4	
Final exam			HW6

Tentative schedule

Date	Chapter	Topics	Reading assignment	HW due
01.10.13	7. Lagrange's Equations	Lagrange's equation for unconstrained motion	7.1	
01.15.13		constrained systems	7.2 – 7.4	
01.17.13		examples of Lagrange's equations	7.5	
01.22.13		Lagrange multipliers	7.10	
01.24.13	Ch 8. Two-body Central-Force Problems	center-of-mass coordinate, reduced mass	8.1 – 8.2	HW1
01.29.13		equation of motion	8.3 – 8.5	
01.31.13		bounded Kepler orbits	8.5 – 8.6	
02.07.13		unbounded Kepler orbits	8.7 - 8.8	
02.12.13	Ch 9. Mechanics in Nonlinear Frames	inertial force	9.1 – 9.2	HW2
02.14.13		angular velocity and acceleration	9.3 – 9.4	
02.19.13		motion in a rotational frame	9.6 -.9.7	
02.21.13		centrifugal and Coriolis force	9.8 – 9.10	
02.26.13	Test1			HW3
02.28.13	Ch 10. Rotational Motion of Rigid Bodies	center of mass and rotation	10.1 – 10.2	
03.12.13		inertia tensor and principle axes	10.3 – 10.5	
03.14.13		precession	10.6	
03.26.13		Euler's equations	10.7 – 10.8	
03.28.13		Euler's angle and motion of a spinning top	10.9 – 10.10	
04.02.13	Ch 11. Coupled Oscillators and Normal Modes	coupled simple harmonic oscillators	11.1 – 11.3	HW4
04.04.13		general formalism of coupled oscillators	11.5	
04.09.13		Lagrangian approach and coupled pendulums	11.4, 11.6	
04.11.13		normal modes and normal coordinates	11.7	
04.11.13	Test 2 (take home test, return on 04.16.13 along with HW5)			
04.16.13	Ch13. Hamiltonian Mechanics	Hamiltonian	13.1 – 13.2	HW5
04.18.13		Hamilton's equations	13.3 – 13.5	
04.23.13		phase-space orbits	13.6	
04.25.13		Liouville's theorem	13.7	
04.30.13	Ch 16. Continuum Mechanics	wave equations and waves	16.1 – 16.2, 16.4	
05.07.13	Final exam			HW6