

Syllabus for Celestial Mechanics; Mathematics 130. Winter of 2017.

meets: M, W, Fri, 1:20PM - 2:25PM, Nat Sci Annex 103.

me: professor Richard Montgomery.

email: rmont@ucsc.edu.

office: McHenry, 4th floor, Math side (4120 I think...)

office hours: TBA. But for the 1st week: Fr 9:00 to 10:30.

Primary Textbook. “The Geometry of Celestial Mechanics.”, by Hans Geiges. London Math. Society

Secondary Textbook. ‘Celestial Mechanics’ by Harry Pollard, reprinted by the AMS.

Evaluations Quizzes, HW, and class participation: 30 percent. Midterm : 30 percent. Final : 40 percent.

By special arrangement you can do a final project instead of take the in-class final. Present me with a proposal, in writing, including primary reference source. (A proposal could be a documented piece of code.) Schedule a meeting with me in office hours to discuss your proposal. Both must be completed within 10 days of the midterm. I plan to put a few ideas on the class web page or mention ideas in class.

Calendar:

First day of class: Jan 9 (Mon)

Holidays : January 16, February 20 (Mondays)

Midterm: Feb 8 (Wed)

Last day of Class: March 17

In-class Final: Thursday, March 23 4:00-7:00 p.m.

READING and LECTURE SCHEDULE; on-line.

HW - on line

Some additional texts and articles

Landau-Lifshitz, vol 1: Mechanics, particularly sections on the central force law.

Feynman: vol 1. On Kepler. Or his book on Kepler.

Milnor’s Math Monthly article on the Kepler problem.

Chenciner’s Scholarpedia (on-line) article on the Three-Body Problem.

Laughlin’s paper on Planet 9.

My Monthly article “The three-body problem and the shape sphere” which can be found on my web page, under ‘publications’).

‘Collisions, Rings and Other Newtonian N-body Problems’, by Don Saari, , CBMS Conf series 104, AMS publication