ENAE 601: Astrodynamics
Syllabus – Fall 2014

Class Times: Mondays and Wednesdays, 3-4:15pm Martin Hall 0135
Instructor: Dr. Christine Hartzell
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Office Hours: Tuesdays 11-12, or by appointment

Prerequisites: ENAE 404, ENAE 441, or equivalent. Knowledge of a programming language (Matlab or C, preferably) is highly recommended.

Required Texts: There are no required texts for this course, however students will likely find a textbook helpful. The following textbooks are good references, and are held in the library reserves:
Fundamentals of Astrodynamics, Bate, Mueller and White, ISBN: 0486600610

General Description of the Course:
Mathematics and applications of orbit theory, building upon the foundations developed in ENAE 404 and ENAE 441. Topics include two body orbits, solutions of Kepler’s equation, the two-point boundary value problem, rendezvous techniques, and Encke’s method.

Course Goals:
The goal of this course is to prepare students for subsequent research or work in the area of astrodynamics. By the end of the course, students should be fluent in the fundamentals of the two body problem and have solid working knowledge of perturbations, maneuvers, and the circular restricted three body problem. Through the course, students will produce a toolbox of computer programs useful for future studies in astrodynamics. Students will also gain experience selecting and pursuing a scientific research topic of their interest, produce a profession-quality written report, and present a the results of their research.

Course Schedule:
See Course Schedule attachment.

Grading Procedures:
Midterm: 30%
Homework: 30%
Final Project: 40%
There will be an in-class **midterm exam** on **Oct 27th**.

Homework will be assigned approximately every 2 weeks and will include a combination of derivations and programming assignments. Homework assignments are due at the beginning of a class period, as a hard copy. Late homework (or digital homework) will not be accepted unless prior arrangements are made with the instructor.

There will be a final project instead of a final exam. The goal of the final project is for students to take material learned in this course and apply it to either an on-going research project or a research project of their choosing. Additionally, the final project will also facilitate the development of report writing and public speaking skills. Deliverables for the final project include a 1 page project proposal, a final report and a final presentation. The **final report proposal** is due **Nov 5**. The **final report** is due **Dec 8**. The final presentations will be given during the class periods the week of Dec 8 and during the final exam period, as required. More details concerning the final project will be provided later in the semester.

**Due Dates of Major Grading Events:**
Oct 27: Midterm Exam
Nov 5: Final Report Proposal Due
Dec 8: Final Report Due

**Communication Outside the Classroom and Emergency Protocol:**
Email will be the primary means of communication outside of the classroom. Any and all homework assignments or other handouts will be posted on ELMS. If classes need to be cancelled, reschedule or otherwise adjusted, the announcement will be made via email. Additionally, in the case that the University is closed for an extended period of time, contingency plans regarding the course will be announced via email.

**Religious Observances:**
If a student will be participating in a religious holiday that conflicts with an exam or other major event in this course, it is the student’s responsibility to inform the instructor of this conflict within the first two weeks of the course so that accommodations can be made.

**Attendance:**
In-class attendance is important to students’ success in this class. If a student has a non-medical and non-religious conflict (e.g. travel to a conference) with a class session or homework due date, the student must inform the instructor prior to the missed class or due date so that accommodations can be made. Students will be required to know the material covered in the classes missed and should plan to get notes from their friends. In the event of a prolonged medically-necessary absence from class, the student should contact the instructor as soon as possible and provide documentation of the illness signed by a medical professional.
**Academic Integrity:**
Academic integrity is important for two main reasons: 1. It ensures that all students learn the material and 2. It allows the instructor to accurately assess students’ understanding of the course material.

Students are allowed to discuss homework problems and solution methods in order to promote better understanding of the material. Students are not allowed to copy solutions.

Students are not allowed to collaborate on exams or projects. Exams and projects serve as summative assessments and thus should be representations of a single student’s mastery of the course material. Specifically during the course project, **plagiarism will not be tolerated.** Appropriate citations are required. The following statement must be included and signed at the top of the student’s exam and project: *I pledge on my honor that I have not given or received any unauthorized assistance on this examination (or project).*

All incidents of academic dishonesty will be reported to the Student Honor Council.

**Students with Disabilities:**
Students with disabilities should contact the instructor so that accommodations can be made in accordance with the University’s policy.

**Copyright Notice:**
Class lectures and course materials are copyrighted and are for individual use. Any other use of the course materials must be approved by the instructor.