

ASTR 7830 Space and Astrophysical Plasmas 2017 Syllabus

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Office Hours: Tuesday/Thursday 3:00-4:30 (*Or by Appointment*)

Department: Physics and Astronomy, 203 Van Allen Hall, DEO Fred Skiff

Description: This course will introduce students to plasma physics in solar system and astrophysical contexts. We will focus on how plasma physics works in a variety of space environments, with a heavy emphasis on applications. The course has no prerequisites, but familiarity with electricity and magnetism at the Griffiths level is highly recommended. We will introduce plasma physics theory as needed to cover topics of interest. The course will cover material from the book as well as other sources. Grades will be based on homework and a final project (no exams). Homework assignments will be given in class and on the course web page.

Lectures: T Th 11:00-12:15, 65 Van Allen Hall

Required Text: *Space Physics: An Introduction*, Russell, Luhmann, and Strangeway

Course Web Pages:

Main Course Web Page:

http://www.physics.uiowa.edu/~jhalekas/teaching/spaceastroplasma_2017/index.html

ICON: <https://uiowa.instructure.com/courses/62001>

Course Work: This is a 3 semester-hour course, with two weekly 1:15 lectures. Coursework consists of weekly homework assignments and a final project.

Grading:

Homework	2/3 of grade
Final Project	1/3 of grade

Course grades will follow the standard College of Liberal Arts and Sciences system. +/- grades are possible but will be assigned sparingly.

Homework: Weekly homework assignments will be due in class on Thursdays (assignments can also be turned in **early** in my office or mailbox). Late homework will not be accepted except in extraordinary circumstances with prior approval. Homework assignments will be long form, hand-written and hand-graded. Partial credit may be assigned for solutions that follow correct logic but make an error at an intermediate step. Therefore, showing your work completely, carefully, and logically is crucial. You are allowed to work with other students on the homework, but each student must write out their own complete solutions.

Final Project: The final project will be a research paper on a topic of the student's choosing. This paper should cover a relevant topic in space and/or astrophysical plasmas with enough detail that someone could use it as background reading before beginning an original research project (think of this as the first chapter of a Masters or Ph.D. thesis). The paper should be at least 2500 words (roughly 5 pages single-spaced), with at least 5 references, and should include at least 5 equations. Illustrative figures are not required but are highly encouraged. Original theory or derivations are certainly allowed but are not required. The paper should combine material from relevant references (don't just copy a derivation from a single paper).

I will provide a list of possible topics as examples, but your topic can be anything that meets the criteria listed above. A 100-word abstract on your project topic will be required midway through the course. I will give you feedback on the topic at this point and let you know whether any adjustments are needed.

The final project will be due the last day of class (December 7th) in hardcopy or electronic (preferred) format. I highly recommend that you start work on the project well before this time!

Absence Policy: Attendance is strongly encouraged for all regular class meetings. Homework will be much more difficult if you do not attend class.

Communication: Students may communicate with the professor by phone, e-mail, or in person. E-mail messages and phone calls may not always be answered immediately (other than in emergencies). Students with issues or questions should if possible raise them in person, in discussion, by attending office hours, or by scheduling an appointment with the professor.

College of Liberal Arts and Science Policies & Resources

Administrative Home

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at <http://clas.uiowa.edu/students/handbook>.

Electronic Communication

University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences ([Operations Manual, III.15.2](#), k.11).

Accommodations for Disabilities

The University of Iowa is committed to providing an educational experience that is accessible to all students. A student may request academic accommodations for a disability (which includes but is not limited to mental health, attention, learning, vision, and physical or health-related conditions). A student seeking academic accommodations should first register with Student Disability Services and then meet with the course instructor privately in the instructor's office to make particular arrangements. Reasonable accommodations are established through an interactive process between the student, instructor, and SDS. See <http://sds.studentlife.uiowa.edu/> for information.

Nondiscrimination in the Classroom

The University of Iowa is committed to making the classroom a respectful and inclusive space for all people irrespective of their gender, sexual, racial, religious or other identities. Toward this goal, students are invited to optionally share their preferred names and pronouns with their instructors and classmates. The University of Iowa prohibits discrimination and harassment against individuals on the basis of race, class, gender, sexual orientation, national origin, and other identity categories set forth in the University's Human Rights policy. For more information, contact the Office of Equal Opportunity and Diversity, diversity@iowa.edu or visit diversity.uiowa.edu.

Academic Honesty

All CLAS students or students taking classes offered by CLAS have, in essence, agreed to the College's [Code of Academic Honesty](#): "I pledge to do my own academic work and to excel to the best of my abilities, upholding the [IOWA Challenge](#). I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty." Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled ([CLAS Academic Policies Handbook](#)).

CLAS Final Examination Policies

The final examination schedule for each class is announced by the Registrar, generally by the fifth week of classes. Final exams are offered only during the official final examination period. **No exams of any kind are allowed during the last week of classes.** All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar's web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of a final exam.

Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit with the instructor (and the course supervisor), and then with the departmental DEO. Complaints must be made within six months of the incident ([CLAS Academic Policies Handbook](#)).

Understanding Sexual Harassment

Sexual harassment subverts the mission of the University and threatens the well being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI [Comprehensive Guide on Sexual Harassment](#) for assistance, definitions, and the full University policy.

Reacting Safely to Severe Weather

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the [Department of Public Safety website](#).