

29:195

Plasma Physics II

Spring 2009

Instructor: Gregory Howes
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Office Hours: 10:45-11:45am T, 2-4pm W, or by appointment
Department: Physics & Astronomy, 203 Van Allen Hall, Prof. Thomas Boggess, Chair

Catalog Description: Continuation of 029:194, which is prerequisite. Topic covered are linear, nonlinear solutions of the Vlasov equation and the kinetic theory of plasmas, including Landau damping and velocity space instabilities.

Meeting: Tuesday and Thursday 9:30 am - 10:45 am
618 Van Allen Hall

Textbook: Required: D. A. Gurnett & A. Bhattacharjee, *Introduction to Plasma Physics with Space and Laboratory Applications*
Optional: T. J. M. Boyd & J. J. Sanderson, *The Physics of Plasmas*

Web Page: <http://www.physics.uiowa.edu/~ghowes/teach/phys195/index.html>

Exams **Two Midterm Exams:** Tentatively on Thursday, Feb 26 and Thursday, Apr 23
Final Exam: Friday, May 15th, 2009 7:30 am

Grading: Homework: 20%
Two Midterm Exams: 20% each
Final Exam: 40%

Homework: Homework will be assigned on a regular basis with a time allotment corresponding to the level of difficulty. Longer assignments will be weighted more heavily in the homework score. Some assignments will involve a certain amount of computer work. Late homework will not be accepted. You are encouraged to work together in groups on the homework, but each student must write his or her own solutions; you may discuss how to solve the problem together, but you may not copy another student's solution.

Topics:

1. Cold plasma waves
2. MHD Stability
3. Kinetic Theory and Landau Damping
4. A Selection of Special Topics: Shocks, Turbulence, Space Physics, etc.

Reference books: R.D. Hazeltine and F.L. Waelbroeck, *The Framework of Plasma Physics*
N.A. Krall and A.W. Trivelpiece, *Principles of Plasma Physics*
D.R. Nicholson, *Introduction to Plasma Theory*

The College of Liberal Arts and Sciences Policies and Procedures

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 Academic Handbook.

www.clas.uiowa.edu/students/academic_handbook/index.shtml

Academic Fraud

Plagiarism and any other activities when students present work that is not their own are academic fraud. Academic fraud is reported to the departmental DEO and to the Associate Dean for Academic Programs and Services who enforces the appropriate consequences.

www.clas.uiowa.edu/students/academic_handbook/ix.shtm

Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit the instructor, then the course supervisor and the departmental DEO. Complaints must be made within six months of the incident.

www.clas.uiowa.edu/students/academic_handbook/ix.shtml#5

Accommodations for Disabilities

A student seeking academic accommodations should register with Student Disability Services and meet privately with the course instructor to make particular arrangements. For more information, visit this site:

www.uiowa.edu/~sds/

Understanding Sexual Harassment

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. Visit www.sexualharassment.uiowa.edu for definitions, assistance, and the full University policy.

Reacting Safely to Severe Weather

In severe weather, the class members should seek shelter in the innermost part of the building, if possible at the lowest level, staying clear of windows and free-standing expanses. The class will continue if possible when the event is over. (Operations Manual 16.14. i.)