Course Syllabus

Lecturer: Dr. D. J. Drake
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Office: Nevins Hall 2210
Office hours: M 2:30-4:00, T&R 3:00-4:30, and by appointment

Textbooks:
Fundamentals of Statistical Mechanics, by J. D. Walecka, Imperial College Press, 2000

Suggested Texts:
Introduction to Plasma Physics and Controlled Fusion by F. F. Chen, Springer Publishing Co., 2010

Prerequisite: MATH 2261, 2262, & 2263 and PHYS 2211K & 2212K

Course Schedule: MW 1:00-2:15, NH 2035
Lectures will be devoted to discussing and clarifying text material, to working illustrative problems, and to demonstrating thermodynamic principles and their applications. Your experience will be most rewarding if you read the sections to be covered before coming to lecture. You may not understand all the material, but a prior reading will help you focus your attention on the portion of the lecture that covers it. As soon after lecture as possible, study the text and the notes you took in class. Remember you are required to know not only what is covered in the lectures, but also what is covered in the text book.

Course Description: Basic principles of classical thermodynamics, which includes open and closed systems for both steady and transient processes.

Material to be Covered: This course is designed to teach the principles of thermodynamics. Work will be done with ideal gasses, energy and mass conservation, entropy, and incompressible substances. Those taking this class must be proficient in algebra, trigonometry, and elementary differential and integral calculus; work will involve linear and quadratic functions, using scientific notation, graphing data, and solving systems of equations. From an engineering or science perspective, a student will be able to apply advanced mathematics and physical principles to demonstrate that he/she understands the laws of thermodynamics and there application to gas power and vapor power systems.

Warning: PHYS 4310 is a writing intensive course. Be prepared to find that more than 50% of the homework, in-class assignments, and test problems will require qualitative explanations of key physics concepts.
Departmental Curriculum Objectives and Course Outcomes:

1. Students will demonstrate knowledge in the fundamental branches of physics.
   a. Students will demonstrate understanding of the concept of heat transfer, work interactions, and mass flow.
   b. Students will demonstrate an understanding of the four laws of thermodynamics.
   c. Students will demonstrate the ability to identify an open vs. closed system, steady vs. non-steady state systems, and compressible vs. incompressible substances.
   d. Students will demonstrate an understanding in classical statistical mechanics for ideal monatomic gases.

2. Students will apply techniques of mathematical analysis (algebra, geometry, trigonometry, and calculus) to physics problems.
   a. Students will apply mathematical tools to accurately determine the properties of compressible, incompressible, and ideal substances.
   b. Students will apply mathematical tools to determine solutions for problems involving open and closed systems for both steady and non-steady state situations.
   c. Students will apply mathematical techniques to accurately determine distribution functions, intrinsic and extrinsic properties, and phase densities for statistical ensembles.

Final Course Grade: A letter grade is determined only at the end of the term. Course grades will be based on test grades, final exam grade, assigned homework, laboratory work, and quizzes. The relative weight is the following:

- Final Exam: 20%
- Tests: 20% each
- Homework and In-class Assignments: 20%

The course grading scale will be follows:

- A 90% - 100%
- B 80% - 89%
- C 70% - 79%
- D 60% - 69%
- F 0 - 59%

Final Exam: The final exam for this class will be held on Wednesday, December 7, 2016 at 12:30pm. The exam will be cumulative. You will be allowed a calculator (cannot be shared with another student), pencil/pen, and scrap paper. A make-up exam can be granted only if the absence is considered an excused absence as listed in the attendance policy below.

Tests: During this semester you will have three tests during the second half of class. The first will be held on September 7th, second on October 5th, and the third on November 2nd. A brief review will be provided for each test. You will be allowed a calculator (cannot be shared with
another student), pencil/pen, and scrap paper. All in-class tests must be turned in at the end of the class period with no exceptions. Make-up tests can be granted only if the absence is considered an excused absence as listed in the attendance policy below.

Homework and In-class Assignments: Homework will be given from the textbook on a bi-weekly based on the material discussed in class during the previous week. Additionally, once or twice a week short homework assignments will be posted on Blazeview. This includes, but is not limited to, problem sets, reading assignments, and short videos which demonstrate specific concepts being discussed in class. Homework is due by the date and time indicated. No make-ups will be given for missed homework.

Attendance Policy: The university attendance policy states, "The university expects that all students shall regularly attend all scheduled class meetings held for instruction or examination." An attendance sheet will be provided at all lectures meetings. You are expected to sign the sheet for all scheduled sessions. In addition, "All students are held responsible for knowing the specific attendance requirements as prescribed by their instructor. . . . When students are to be absent from class, they should immediately contact the instructor. A student who misses more than 20% of the scheduled classes of a course will be subject to receiving a failing grade in the course.” Any student missing more than 20% of the lecture sections will automatically receive a failing grade for the course. Alternatively, any student missing 20% or more of the assigned laboratory sessions will be subject to a failing grade for this course. For this course, that is equivalent to missing 6 lecture sessions.

There are six categories of acceptable reasons under which a student may request a make-up test or exam. Make-up tests will be determined by the professor and at the sole discretion of the professor. These assignments may or may not exactly duplicate the original test or exam.

- **Death or serious illness in the immediate family.** The immediate family includes spouse, children, parent, siblings, grandparents and uncles/aunts. Verification may be required.
- **Serious illness or injury of the student.** A physician/health care professional must be consulted about the injury or illness, and home-rest or hospitalization that would prevent your attendance, must be prescribed. **Required Verification:** A letter from the student’s physician is required, noting the duration of the time that the student was directed to rest at home.
- **Court ordered appearances or a call to jury duty.** **Required Verification:** A copy of the official notification.
- **Military duty and deployments.** **Required Verification:** A duty bill, note from the commanding officer or a copy of the deployment orders is required.
- **Religious prohibitions.** Verification may be required.
- **Collegiate Athlete.** Verification required

Student Opinion of Instruction (SOI): At the end of the term, all students will be expected to complete an online Student Opinion of Instruction survey (SOI) that will be available on BANNER. Students will receive an email notification through their VSU email address when the SOI is available (generally at least one week before the end of the term). SOI responses are
anonymous to instructors/administrators. Instructors will be able to view only a summary of all responses three days after they have submitted final grades. While instructors will not be able to view individual responses or to access any of the data until after final grade submission, they will be able to see which students have or have not completed their SOIs, and student compliance may be considered in the determination of the final course grade. These compliance and non-compliance reports will not be available once instructors are able to access the results. Complete information about the SOIs, including how to access the survey and a timetable for this term is available at [http://www.valdosta.edu/academic/OnlineSOIPilotProject.shtml](http://www.valdosta.edu/academic/OnlineSOIPilotProject.shtml).

**Disruptive Behavior Policy:** Disruptive students may be removed from the class. Disruptive behavior includes but is not limited to: offensive language and behavior, incessant talking, interrupting class with personal or non-academic concerns, distracting students from the task at hand, drawing on desk tops, taking frequent unscheduled breaks, annoying other students, tardiness, leaving early, using cell phones, or pagers in class, etc. All cell phones, pagers, and beepers must be turned off or set on vibrate during class time. If you realize that you have an incoming call that you must attend to, leave the room quietly to do so. Do not attend to it in class. Students are responsible for being aware of the policies, procedures and student responsibilities contained within the current edition of the Valdosta State University Catalog and Student Handbook.

**Classroom Emergency Procedure:** In the event of a bomb threat, tornado, or fire, students and staff may be asked to evacuate the building or move to a secure location within the building. Evacuation routes for movement to an external location or to a shelter within the building are posted at the front of the room. Students should review the maps and make sure that the exit route and assembly location for the building are clearly understood. If you have a disability that may require assistance during an evacuation, please let your faculty know at the end of the first class.

**Disability Services Policy:** Valdosta State University is an equal opportunity educational institution. As such, reasonable accommodations will be made for students with disabilities provided those students have registered with the Access Office for Students with Disabilities in Faber Hall. The phone numbers are 229-245-2498 (V), 229-375-5871 (VP), and 229-219-1348 (TTY). Present your instructor with the documentation. For more information, please visit [http://www.valdosta.edu/student/disability/](http://www.valdosta.edu/student/disability/) or email: access@valdosta.edu.

**Academic Misconduct and Dishonesty Policy:** Students are expected to abide by the VSU Academic Integrity code. "Academic integrity is the responsibility of all VSU faculty and students. Faculty members should promote academic integrity by including clear instruction on the components of academic integrity and clearly defining the penalties for cheating and plagiarism in their course syllabi. Students are responsible for knowing and abiding by the Academic Integrity Policy as set forth in the Student Code of Conduct and the faculty members’ syllabi. All students are expected to do their own work and to uphold a high standard of academic ethics." Violation of academic honesty includes, but is not limited to, the following actions:

1. Cheating on an examination or quiz – either giving or receiving information.
2. Copying information from another person for graded assignments, including that information obtained from an Internet source.
3. Using unauthorized materials during tests.
4. Collaborating during examinations.
5. Buying, selling or stealing examinations.
6. Arranging a substitute for oneself during an examination.
7. Substituting for another person, or arranging such a substitution.
8. Plagiarism – the intentional or accidental presentation of another’s words or ideas as your own.
9. Submission of work other than your own for written assignments.
10. Incorporating the words or ideas of an author into one’s paper without giving the author due credit.
11. Collaboration with another person or persons in submitting work for credit in class or lab, unless such collaboration is approved in advance by the instructor.

**Any student found committing any of these violations will automatically receive a failing grade for the entire course.** For more information visit [http://www.valdosta.edu/academics/academic-affairs/vp-office/academic-honesty-policies-and-procedures.php](http://www.valdosta.edu/academics/academic-affairs/vp-office/academic-honesty-policies-and-procedures.php)

**Course Compliance Statement:** Enrollment in this class signifies that the student has agreed to abide by and adhere to the policies and regulations specified above. It is understood that the instructor may adapt or change this syllabus and the assignments contained within it according to circumstances that may arise during the course of the semester.