FAYETTEVILLE STATE UNIVERSITY
College of Arts and Sciences
Department of Chemistry and Physics

SYLLABUS

I. LOCATOR INFORMATION:

Semester: Spring Year: 20??

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Name</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>PHYS 212-01</td>
<td>HEAT (Thermodynamics)</td>
<td>4</td>
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</tbody>
</table>

I. Locator Information:

Instructor: Professor A. Umantsev  Office Location: SciTech 320
Office hours: MWF 12:50–01:50PM; T 10-11AM; TR 10:16–11:16PM
Also available other times by appointment
Tel.: (910) 672-1449; 867-1991 Email address: aumantsev@uncfsu.edu  Call or email if you have questions

Course # and Name: PHYS 212-01
Semester Credit Hours: 4.0
Total Contact Hours for Class: 5.0
Day, Time, and Location of Class Meetings:
Lecture: MWF 12:00–12:50PM; in Room SciTech 228; Lab T 08:00 – 09:50 AM in Room LS 219

Departmental Office Location: SciTech Room 303
Departmental Office Telephone: 672-2441

The following statement should appear on the first page of each course syllabus:

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account (username@uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.

Rules and regulations governing the use of FSU email may be found at http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf

II. PREREQUISITE: Physics 122 and Math 241

III. COURSE DESCRIPTION:

This course is an intermediate-level concentration in thermodynamics dealing with laws of thermodynamics, open and closed systems, kinetic theory of gases, phase transitions, etc, with laboratory exercises complementing theory. It also provides a foundation in statistical mechanics which can be easily connected to thermodynamics. Calculus (differential and integral) is used extensively, and a knowledge of differential equations would be helpful. Strong emphasis is placed on problem–solving. The acquisition of a scientific calculator is highly recommended. The objective behind studying these principles is to cultivate an interest in the student to understand the natural laws and to develop analytical skills for the student to be able to tackle some of the fundamental problems in nature.

IV. TEXTBOOK:

CLASSICAL & STATISTICAL THERMODYNAMICS (First Edition) by Ashely H. Carter
V. Course Requirements
The instructor will respect all students and will make every effort to maintain a classroom climate that promotes learning for all students. Students must accept their responsibility for maintaining a positive classroom environment by abiding by the following rules:

1. Attend all lecture and laboratory sessions, except in cases of illness and other unforeseen emergencies. It is the student’s responsibility to contact the instructor about the steps that must be taken for making up any and all missed work. It is recommended that contact with the instructor take place within twenty-four (24) hours of having missed class. The University policy concerning absences from class will be strictly enforced. Absences exceeding 10% of the total contact hours the course meets during the semester (that amounts to approximately seven (7) total hours of unexcused absences) will fall in the category of ‘EXCESSIVE ABSENCES-EA’. As per new guidelines, ‘WN’ grade has been eliminated and it is the STUDENT’S RESPONSIBILITY TO WITHDRAW FROM THE CLASS. Please refer to ‘Revision of Grades-Student Responsibilities’ at www.uncfsu.edu/fsuretension/policiesprocedures.

2. Be punctual. Attendance will be taken promptly at the beginning of each session. Any student coming in after the roll has been called will have been marked absent. It is the student's responsibility to see that all tardies have been duly noted. Students will also be charged with a tardy for departure from the class before the specified end of class. The accumulation of three (3) tardies will result in the student being charged with one (1) absence.

3. Participate actively in classroom discussions and activities. Two key ingredients of every student's learning are sharing opinions and experiences with others, and interacting with others in the teaching-learning situation.

4. Read over and take notes on the indicated chapters BEFORE they are presented in class. This activity mentally prepares one for the learning experience. It also is important because it raises questions that one needs to have answered in order to fully understand concepts presented.

5. Take notes in class. Recopy these notes at the first opportunity after class and certainly the same day as the class in which the notes were taken. Reconcile any discrepancies in the notes taken in class as well as with notes taken in initial reading. Add explanations or drawings or other examples for clarity.

6. Study about two hours for each hour of lecture. This is an absolute minimum for maximum success in a class.

7. Avail yourself of all pertinent audiovisual and computer-assisted instructional materials.

8. Take examinations ON THE SCHEDULED DATES. No make-up examinations will undertake. An automatic grade of ZERO is recorded for any exam missed for any reason.

9. Be in compliance with the university policy on drugs which prohibits the possession or use of alcoholic beverages or illegal drugs on any part of the campus.

10. Students are permitted to use calculators in the class. However, “CELL PHONES ARE NOT ALLOWED TO BE USED AS CALCULATORS” in the classroom.

11. Students are not permitted to wear headphones or other paraphernalia that may be distracting to the classroom environment.

12. Students must refrain from any activity that will disrupt the class; this includes turning off cell phones and pagers.

13. Students are not permitted to use profanity in the classroom. They must not pass notes or carry on private conversations while class is being conducted.

14. SEE THE INSTRUCTOR IMMEDIATELY WHEN SPECIFIC DIFFICULTIES ARE ENCOUNTERED.

VI. Academic Support Resources – Frequently access Instructor’s webpage for Lecture Notes, Assignments, etc.
VI COURSE OUTLINE WITH ASSIGNMENT SCHEDULE:

Lectures and laboratory exercises will be undertaken in accordance with the following assignment schedule. It is also assumed that in addition to the topics listed below, the student is assigned both the textual material as well as the exercise problems at the end of the chapters. Any item listed below may be arbitrarily changed by the instructor for his/her convenience, or as the constraints imposed by equipment and space limitations may compel.

**Topic Outline:** This course will cover Chapters 1 – 13 of the Text Book.

<table>
<thead>
<tr>
<th>Date (Tentative)</th>
<th>Topic</th>
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<tr>
<td>Week of Jan. 11</td>
<td>Chapter 1: The Nature of Thermodynamics</td>
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| Week of Jan. 18  | Chapter 2: Equations of State  
Jan. 20 is MLK Holiday |
| Week of Jan. 25  | Chapter 3: The First Law of Thermodynamics |
| Week of Jan 30   | Chapter 4: Applications of the First Law  
Exam 1: Tuesday, February 07 (on Chapters 1, 2, 3) |
| Week of Feb. 06  | Chapter 5: Consequences of the First Law |
| Week of Feb. 13  | Chapter 6: The Second Law of Thermodynamics |
| Week of Feb. 20  | Chapter 6: Continues |
| Week of Feb 27   | Chapter 7: Applications of the Second Law of Thermodynamics  
Exam 2: Tuesday, ‘February 28 (on Chapters 4, 5, 6) |
| Week of Mar. 05  | SPRING BREAK (no classes)  
Week of Mar. 12   | Chapter 8 Thermodynamic Potentials |
| Week of Mar. 19  | Chapter 10: The Third Law of Thermodynamics |
| Week of Mar. 26  | Chapter 11: The Kinetic Theory of Gases  
Exam 3: Tuesday, March 27 (on Chapters 7, 8, 10) |
| Week of Apr. 02  | Chapter 12 Statistical Thermodynamics |
| Week of Apr. 09  | Chapter 13: Classical and Quantum Statistics |
| Week of Apr. 16  | Chapter 14: The Classical Statistical Treatment of Ideal Gases  
Exam 4: Tuesday, April 17 (on Chapters 11, 12, 13, 14) |
| Week of Apr. 23  | Chapter 15: The Heat Capacity of Diatomic Gases |
|                  | Review for the FINAL EXAM |
| **Final Exam**   | **Final Exam** Wednesday, ‘MAY 02, 12:00 AM – 12:50 PM** |
VII. Evaluation Criteria

The progress of each student will be evaluated by means of FOUR exams to be given during the semester, quizzes and homework, reports related to the laboratory exercises performed, and a final examination. The lowest exam may be dropped at the discretion of the instructor.

A. Grade Distribution:
Final grades will be determined by weighting the averages and scores from the above-mentioned evaluative activities.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Weightage</th>
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<tbody>
<tr>
<td>Four Exams</td>
<td>40%</td>
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<tr>
<td>Quizzes and Homeworks</td>
<td>15%</td>
</tr>
<tr>
<td>Laboratory Exercises</td>
<td>25%</td>
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<tr>
<td>Final Examination</td>
<td>20%</td>
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B. Grading Scale:
The final letter grade assigned to the student will be based upon the following numerical equivalencies as stated in the University Catalog.

- **A** = 90 - 100 Superior
- **B** = 80 - 89 Good
- **C** = 70 - 79 Marginal
- **D** = 60 - 69 Below marginal
- **F** = Below 60 Failure

Please note: If these evaluation criteria must be revised because of extraordinary circumstances, the instructor will distribute a written amendment to the syllabus.

VIII. TEACHING STRATEGIES:

The primary teaching strategy for this course will take the form of lectures and demonstrations of the specific processes and effects related to the topics of interest.

BIBLIOGRAPHY

The textbook will be considered the primary resource in this class. However, textbooks often do not contain enough information or information in the manner that will be most advantageous for student learning. In light of these shortcomings, it is recommended that each student perform additional reading on each topic covered in class. This may be accomplished by seeking other physical science texts in the library or the instructor's office. It is recommended that the student read the following books:


During the time frame in which this course is taught, far more exciting discoveries and interpretations will undoubtedly occur which will not be in texts. It is therefore recommended that the student routinely examine periodical literature such as: Science News, Science, Scientific America, American Journal of Physics, Physics Today, Physical Review, Physical Review Letters, and many others.
REVISION OF GRADES – STUDENT RESPONSIBILITIES

The following revisions become effective on August 16, 2007.

WN GRADE DISCONTINUED:
  STUDENTS: Do not expect faculty to withdraw you for non-attendance. Drop or withdraw* from classes according to the deadlines published in the catalog. *See warning below about class withdrawals.

NEW TYPE OF GRADE: INTERIM GRADES – (New name for “midterm grade,” with additional purposes). Interim grades will be assigned from the first week of the semester until the deadline for class withdrawals. Interim grades are used for informational and warning purposes only; they are not part of your permanent transcript and have no effect on your GPA. Instructors may assign interim grade of F to warn students of poor academic performance or they may assign “X” or “EA” grades. (See below for explanations) After midterm, faculty will assign all students an interim grade of A – F to inform students of their academic status as of midterm.
- INTERIM GRADE X = NO SHOW – Assigned to students who are on a class roster, but never attend class. For warning purposes only; NOT a final grade.
  STUDENTS: Check interim grades early in the semester. If you have an X grade, either begin attending the class or withdraw* from it. *See warning below about class withdrawals. If you do not take action in response to an X grade, you will receive a final grade of FN. (See “FN” below)
- INTERIM GRADE EA = EXCESSIVE ABSENCES - Assigned to students whose class absences exceed 10% of the total contact hours. For warning purposes only, NOT a final grade.
  STUDENTS: Check your interim grades often. If you have an “EA” grade for a class, you are in jeopardy of failure if you do not take immediate actions. Either resume attending the class or withdraw from it. *See warning below about class withdrawals.

NEW FINAL GRADE:
- FN = FAILURE DUE TO NON-ATTENDANCE – Assigned to students who are on class roster, but never attend the class. An FN grades is equivalent to an F grade in the calculation of the GPA.
  STUDENTS: You must attend (or withdraw* from) all the classes for which you are enrolled. *See warning below about class withdrawals.

WARNING ABOUT CLASS WITHDRAWALS:
- When you withdraw from a class, you are wasting your money and time. You receive no refund for withdrawing from individual classes and you slow your progress toward degree completion.
- If you withdraw from or fail more than one-third of your classes, you will no longer be eligible for financial aid.
- STRIVE TO EARN CREDIT FOR ALL THE CLASSES IN WHICH YOU ENROLL! WITHDRAW FROM CLASSES ONLY WHEN IT IS ABSOLUTELY NECESSARY!