Instructor: Dr. Kisa Ranasinghe  
Office: H260h  
email: kranasin@spsu.edu  
Phone: 678-916-3161

Office Hrs: MWF 11.00 am -12.00 noon  
TR 1.00-2.00 -pm and by appointments

Textbook: An Introduction to Thermal Physics, by D.V. Schroeder, Addison-Wesley-Longman, 2000

Course Outline: We will be starting with the fundamentals of classical and the statistical approach to the thermodynamics. We will learn the laws of thermodynamics with both classical and statistical approach. We will discuss the heat engines, refrigerators, free energy, and phase transformation. Then we will discuss the Boltzmann and quantum statistics in detail.

I may not follow the exact format of the textbook as it discuss lot more statistics at the beginning. I may move among chapters.

You have to have a good understanding of calculus, specially integration and partial differentials on spherical and cylindrical coordinates. We will be using some quantum mechanics, if you have not yet taken the quantum mechanics, refer the appendix

Tentative Schedule: I may not stick to the schedule as I change the materials I plan to cover due to student performances.

Week 1, 2 and 3: Intro to Thermal Physics and first law  
Week 4 and 5: Thermodynamic probability, Entropy, and second law  
Week 6 and 7: Interaction and equilibrium  
Week 8 and 9: Engines and refrigerators  
Week 10 and 11: Free energy and phase transformation  
Week 12 and 13: Boltzmann statistics  
Week 14 and 15: Quantum statistics  
Week 17: Final exam week

Grade Scale:  
Unit Exams: 50%  
Homework: 30%  
Final Exam: 20%

Homework: You will be given homework through out the semester. You need to turn them in on a given due date at the beginning of class and if you fail to turn them in on time, you have until the end of the week (Friday 5pm) to turn it in with a penalty of 25% deduction. Any homework after the end of the week its due will NOT be graded. You may discuss the homework problems with each other and I encourage discussions among students, but you may not copy solutions from another. The solutions that you submit must be entirely yours and your own words. Any copied work will received a zero.

Exams: You will be given two unit exams and one final exam. You are allowed to bring one page of equation sheet for the unit exams and the final exam will be a take home. There will be no make up exams.
The following exam schedule is TENTATIVE:
Exam 1: week 6
Exam 2: week 12
Final exam: week 17 (TBA)

Important Dates:
Drop/add: 8/18/2014
Engagement reports due: 9/1/14
Withdrawal day: 10/2/2014
Last day of class: 12/1/2014

References Materials:
1. Classical and Statistical Thermodynamics by Ashley H. Carter
2. Fundamentals of Classical and Statistical Thermodynamics by Bimalendu N. Roy
3. Introduction to Statistical Physics, Second Edition by Kerson Huang
4. Thermal Physics by Ralph Baierlein
5. Heat and Thermodynamics by Zemansky (and Dittman)
6. Thermodynamics, Kinetic Theory, and Statistical Mechanics by Sears and Salinger
7. Thermal Physics by Kittel and Kroemer (Non-traditional approach)
8. Thermal Physics by Baierlein

Students Learning Outcomes:
(1) Students demonstrate knowledge of core principles in thermodynamics
(2) Explains and interprets three laws of thermodynamics and their applications
(3) How to apply the statistical approach to thermodynamics
(4) Students effectively apply knowledge to solve problems in thermodynamics

Disability Statement:
“Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the counselor working with disabilities as soon as possible to better ensure that such accommodations are implemented in a timely fashion.”

If you need to use the testing services, you are required to register with them and you need to inform me. You are responsible to make arrangements to have your exams with them.

Academic Dishonesty:
The policy of academic dishonesty as stated in the Southern Polytechnic State University Undergraduate Catalog will be fully enforced during this course.

Comments:
I reserve the right to change any part of this syllabus depending on the interest of students and the class progress. Any modification to this syllabus during the course of this semester will be announced in class in advance of the effective date(s).