

**Thermodynamics**

TuTh 1:00 pm –2:15 pm

109 Lewis Hall

Instructor: Dr. Joel Mobley

[jmobley@olemiss.edu](mailto:jmobley@olemiss.edu) (E-mail is the best way to communicate with me.)

Office: NCPA, Room 1034 – ph:915-6937

NCPA is the **Jamie Whitten National Center for Physical Acoustics**

It is near the roundabout at Chucky Mullins and Hill Dr. See the map at the end of the syllabus. My office is at the extreme southern end of the building near the end of the first corridor. A map is appended to the end.

Office Hours Mon 10:00 am–12:00 pm, 2:00 pm–3:00 pm: **NCPA 1034 or Lewis 203**  
 Tuesday 10:30 am – 11:30 am: **Lewis 203**

On Mondays I may be either in Lewis Hall or NCPA so contact me by email to see where to find me. Other times by appointment: I am glad to meet in-person or by Zoom so do not hesitate to make an appointment outside regular office hours. On Fridays I will be at NCPA all day. *Always contact me by email before you come to NCPA during or outside of office hours. I have research labs at NCPA, and I am often in other parts of the building.*

**Grading**

Homework/Class participation	25 %
Midterm Exams (2)	25 %
Final Exam	25 %

**Grading Scale**

<i>Letter Grade</i>	<i>Minimum Score</i>
A	92
A-	87
B+	83
B	79
B-	74
C+	70
C	66
C-	60
D	50
F	0

The Final Exam is Thursday, December 12th from 12:00 to 3:00.

The final is comprehensive.

**Textbook** – *An Introduction to Thermal Physics* 1<sup>st</sup> Ed., by Daniel V. Schroeder

ISBN-: 0-201-38027-7

**Course Description** – Intermediate description of thermal physics; applications of the first and second laws of thermodynamics. Intermediate examination of the concepts of entropy, free energy, random processes, probability and statistical mechanics.

### **Learning Objectives**

At the completion of this course, the student should be able to describe the laws of thermodynamics and make appropriate use of these to solve problems. They should also be able to describe the statistical concepts underlying the principles of thermal physics. They should be able to derive the free energies from the 2<sup>nd</sup> law of thermodynamics, and have an understanding of entropy and the dependence of macroscopic properties on thermal processes.

### **Topics Covered**

- Energy in thermodynamics
- The First Law
- Macroscopic properties of systems and thermal energy
- Entropy and the Second Law
- Heat engines
- Free energy
- Statistical mechanics

### **Homework Rules**

- Homework sets will be assigned and must be turned in at the beginning of class on the due date. I will accept submissions by email. If you scan them in, they must be a pdf document. *Do not staple! Do all problems on separate pages. Write your name on each page.*
- Students may be asked to present solutions to homework problems on the board in class.
- As scientists and engineers normally work in groups, students are encouraged to work together on homework to teach and learn from each other. However, each student is responsible for understanding all details of each solution.
- Homework help sites such as Chegg are a liability, not a resource. Depending on sites like these are a sure way to do poorly on a quiz or exam. It is also cheating and a great way to fail the course. Instead, work with peers or the instructor. Teaching peers is a great way to solidify your understanding!
- As is true for most physics classes, you must show your work to get full credit. Solutions alone will receive no credit. Your work must be clear and include text notations as needed.

**Policies**

- Attendance is required. For every two unexcused absences, 2 points will be deducted from the overall grade. If you are to be absent for any reason, I expect you to notify me beforehand. *Somebody is paying for you to be here so show up.*
- Class participation is required. You are expected to give thoughtful responses even if you don't know the answer. The intent is to help you think through and analyze problems and concepts. A respectful attitude toward your fellow students is expected. Students will be paired together in order to answer questions and work problems during class.
- Instructors are required to enter attendance verifications for each of their courses by the end of the second week of regular Fall/Spring semester. If you will be absent during the initial two weeks, inform me beforehand (email is ok)
- Refrain from distracting behavior (texting, web surfing, checking email, etc...). Be considerate of your fellow students.

**Academic Integrity**

Every student of the University of Mississippi, by virtue of choosing to be part of the university community agrees to abide by the University of Mississippi Creed and the UM Academic Integrity Policy which covers academic integrity. Cheating on any assignment is forbidden and, in this course, will result in a zero grade on the given assignment. If a second case of cheating occurs, this will result in an F for the entire course. Please consult the M-Book, Academic Integrity document for details on university policy and the academic creed.

**UM Creed**

The University of Mississippi is a community of learning dedicated to nurturing excellence in intellectual inquiry and personal character in an open and diverse environment. As a voluntary member of this community:

- I believe in respect for the dignity of each person
- I believe in fairness and civility
- I believe in personal and professional integrity
- I believe in academic honesty
- I believe in academic freedom
- I believe in good stewardship of our resources
- I pledge to uphold these values and encourage others to follow my example

**Class Materials Policy**

All materials distributed electronically and in hard copy in this class are protected under intellectual copyright. Any attempt to upload these documents onto the Internet (or to distribute them by some other means) or to profit from the distribution (by Internet or other means) of these documents constitutes theft and will be in violation of intellectual property law and the UM Academic Conduct Code unless expressly permitted for by the instructor. Accessing such materials for your own use is also in violation of the UM

Academic Conduct Code. Additionally, the distribution of your own class notes via the Internet or other means, or access of such materials, encourages absence from class and is highly discouraged except for occasional loaning of notes to students concurrently enrolled in the class.

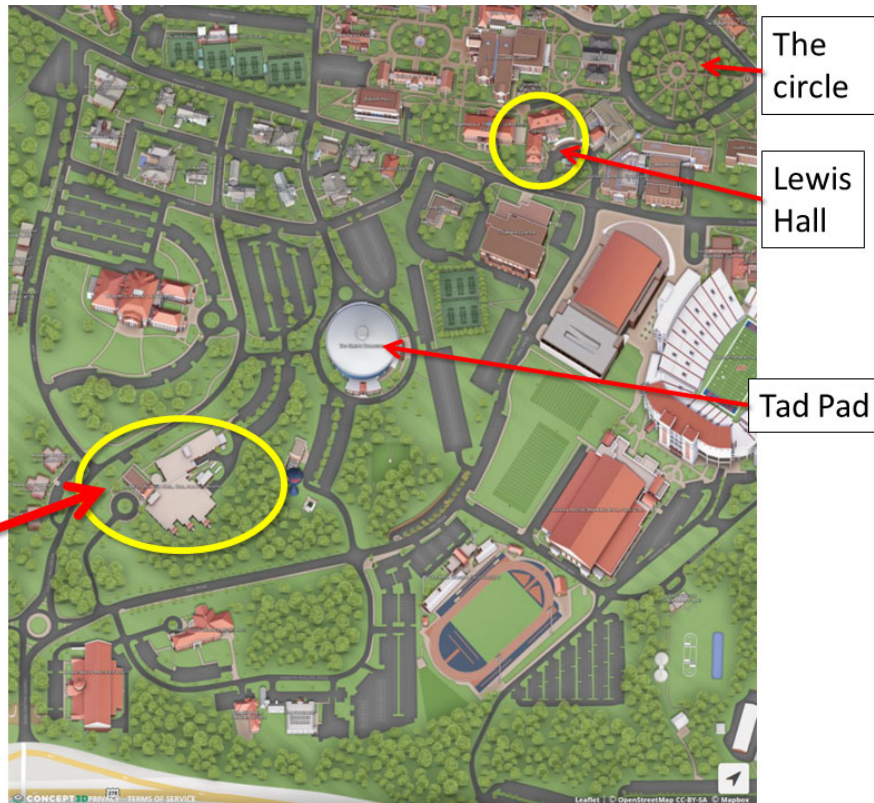
**University of Mississippi Access and Inclusion**

The University of Mississippi is committed to the creation of inclusive learning environments for all students. If there are aspects of the instruction or design of this course that result in barriers to your full inclusion and participation or to accurate assessment of your achievement, please contact the course instructor as soon as possible. Barriers may include, but are not necessarily limited to, timed exams and in-class assignments, difficulty with the acquisition of lecture content, inaccessible web content or the use of non-captioned or non-transcribed video and audio files. Students must also contact Student Disability Services at 662-915-7128 so that office can 1) provide you with an Instructor Notification form, 2) facilitate the removal of barriers and 3) ensure you have equal access to the same opportunities for success that are available to all students.

**Audio and video recording**

Audio and/or video recording of class lectures is not allowed unless explicit permission is given by the instructor. Permission will only be given if the student has a Student Disability Services request. In such cases, recordings may only be used by the student to whom permission is given and all recordings must be deleted at the end of the semester. Recordings may not be distributed online or elsewhere.

**Q:** Where is Dr. Mobley's office?  
**A:** My office is in **NCPA**



**Q:** Where inside of NCPA is Dr. Mobley's office?  
**A:** Room 1034

**DIRECTIONS**

**From Back Door:**

- You will enter into a large atrium.
1. Walk toward the front of the building.
  2. Turn left before you reach the lobby.
  3. Follow the long corridor to the 2<sup>nd</sup> hallway on the right. Take that 2<sup>nd</sup> hallway to the end.
  4. My office is on the left at the end of the hallway.

**From Front Door:**

1. Walk through the lobby into the large atrium.
2. Turn right and follow the long corridor to the 2<sup>nd</sup> hallway on the right. Take that 2<sup>nd</sup> hallway to the end.
3. My office is on the left at the end of the hallway.

