Introductory Thermodynamics
21:750:315: 01

Spring 2018 Syllabus

This class will meet TTh3 (11:30 –12:50) in Smith Hall Room 243
Occasional classes may have to be rescheduled

Instructor:  Reginald C. Farrow
973 596 2473 (phone)   reginald.farrow@rutgers.edu (email)

Office hours: By appointment,
Feel free to communicate by email.

Texts:  THERMAL PHYSICS by Ralph Baierlein
Cambridge University Press  ISBN 0 521 59082 5

Homework to be assigned most weeks, will be collected and reviewed.
You must complete the assignments to fully understand the material.

The first (approximate) month of the course will be a survey of
Thermodynamic Principles, covered in the first 3 or 4 chapters of the text.
Then we will use statistical mechanics (Chapter 5) to cover advanced topics
from other chapters especially 6, 7, 11,13,14 and 15.

Exams and Assignments

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<td>Exam 1</td>
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<td>Homework</td>
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Grading
A, ≥ 87, B+, 82 – 86, B, 75 – 81, C+, 70 – 75, C, 60 – 70, D, 50 – 60, F, < 50
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<th>Week</th>
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| 1    | Jan 16, 18  | 1,2     | Heat and Temperature  
                   First Law of Thermodynamics  
                   Second Law of Thermodynamics  
                   Entropy                        |
| 2    | Jan 23, 25  | 3       | Entropy and Efficiency  
                   Carnot Cycle, Reversibility  
                   Drop w/o W 1/23/18            |
| 3    | Jan 30, Feb 1| 3,4     | Otto Cycle, Practical Engines  
                   Entropy and Quantum Theory  
                   Density of States             |
| 4    | Feb 6, 8    | 1,2,3,4 | Review                                                       |
| 5    | Feb 13, 15  | 5       | EXAM 1 (Chapters 1,2,3,4), Feb 13  
                   Canonical Probability Distribution  
                   Statistical Mechanics          |
| 6    | Feb 20, 22  | 6       | Photons and Phonons                                         |
| 7    | Feb 27, Mar 1| 7     | Chemical Potential                                         |
| 8    | Mar 6, Mar 8| 13      | Classical Limit (Equipartition Theorem)                    |
| 9    | Mar 10, 18  |         | SPRING BREAK                                                |
| 10   | Mar 20, 22  | 15      | Transport Processes                                         
                   Withdraw with W 3/26/18    |
| 11   | Mar 27, 29  | 5,6,7,13| Review                                                      |
| 12   | Apr 3, 5    | 10      | EXAM 2 (Chapters 5,6,7,13), Apr 3  
                   The Free Energies             |
| 13   | Apr 10, 12  | 11      | Chemical Equilibrium                                        |
| 14   | Apr 17, 19  | 14      | Approaching Zero                                            
                   Third Law of Thermodynamics  |
| 15   | Apr 24, 26  | ?       | Advanced Topic                                              
                   Review                       |
| 16   | May 2, 3    |         | READING DAYS                                                |
| 17   | May 8       | All     | 11:45 – 2:45 FINAL EXAM  
                   (All Chapters)               |
Additional Course Resources

Rutgers University-Newark Policies
• Academic Integrity: As an academic community dedicated to the creation, dissemination, and application of knowledge, Rutgers University is committed to Rutgers University–Newark, Faculty of Arts & Sciences, Fall 2016 fostering an intellectual and ethical environment based on the principles of academic integrity. Academic integrity is essential to the success of the University’s educational and research missions, and violations of academic integrity constitute serious offenses against the entire academic community.
  • Academic Integrity Policy: http://academicintegrity.rutgers.edu/academic-integrity-policy/

• Disability Services: Rutgers University welcomes students with disabilities into all of the University’s educational programs. In order to receive consideration for reasonable accommodations, you must complete and submit the Registration Form, schedule and complete an intake meeting, and submit appropriate documentation. If your request for reasonable accommodations is approved, you will receive a Letter of Accommodations (LOA), which you should present privately to the instructor as early in the semester as possible. Accommodations are not retroactive and are effective only upon submission of the LOA to the instructor. Please begin the process, by completing and submitting the Registration Form, available at the website below, Applying for Services.
  • Applying for Services: https://ods.rutgers.edu/students/applying-for-services

  • Documentation Guidelines: https://ods.rutgers.edu/students/documentation-guidelines

  • Letter of Accommodations (LOA): https://ods.rutgers.edu/my-accommodations/letter-of-accommodations

  • Office of Disability Services (ODS)
    Suite 219, Paul Robeson Campus Center
    (973) 353-5315 odsnewark@rutgers.edu
• Religious Holiday Policy: Student are advised to provide timely notification to instructors about necessary absences for religious observances and are responsible for making up the work or exams according to an agreed-upon schedule.

Learning Resources:

• Rutgers Learning Center (tutoring services)
  Room 140, Bradley Hall
  (973) 353-5608 http://www.ncas.rutgers.edu/rlc

• Writing Center (tutoring and writing workshops)
  Room 126, Conklin Hall
  (973) 353-5847
  nwc@rutgers.edu https://www.ncas.rutgers.edu/writingcenter