| ME 200 - Thermodynamics I | | | | | |
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| **Course Syllabus - Spring 2020** | | | | | |
| **Course text: Moran, Shapiro, Boettner, and Bailey, Fundamentals of Engineering Thermodynamics** | | | | | |
| **Lecture** | **Day** | **Date** | **Topics** | **Readings** | **HW-Due Date** |
| 1 | M | 1/13/20 | Syllabus, systems, definitions | 1.2, 1.3 | HW1-1/16 |
| 2 | W | 1/15/20 | Specific volume, pressure, temperature | 1.5-1.7 | HW2-1/16 |
| 3 | F | 1/17/20 | Engineering approach to problem solving | 1.8.2, 1.9 | HW3-1/23 |
| | **M** | **1/20/20** | **Martin Luther King Jr. Day - No Classes** | | |
| 4 | W | 1/22/20 | Mechanical concepts of energy, work | 2.1-2.2.2 | HW4-1/23 |
| 5 | F | 1/24/20 | Moving boundary work, electrical/spring/rotating shaft work | 2.2.3-2.2.6 | HW5-1/30 |
| 6 | M | 1/27/20 | Energy; heat transfer, 1st law without mass flow | 2.3-2.5 | HW6-1/30 |
| 7 | W | 1/29/20 | Evaluating properties, property charts | 3.1-3.3 | HW7-1/30 |
| 8 | F | 1/31/20 | Evaluating properties, property tables | 3.4-3.6 | HW8-2/6 |
| 9 | M | 2/3/20 | Internal energy and enthalpy, energy balance | 3.8, 3.8.1 | HW9-2/6 |
| 10 | W | 2/5/20 | Specific heats, incompressible substances | 3.9, 3.10 | HW10-2/6 |
| 11 | F | 2/7/20 | Ideal gas model, ideal gas properties | 3.12, 3.13 | HW11-2/13 |
| 12 | M | 2/10/20 | Ideal gas tables, polytropic processes | 3.14.1, 3.14.2,13.15 | HW12-2/13 |
| 13 | W | 2/12/20 | Conservation of mass, 1st law without mass flow | 4.1-4.3 | HW13-2/13 |
| 14 | F | 2/14/20 | 1st law with mass flow | 4.4, 4.5 | HW14-2/20 |
| 15 | M | 2/17/20 | 1st law practice | 4.6-4.10 | HW15-2/20 |
| | **W** | **2/19/20** | **EXAM 1: 6:30 - 7:30 pm; PHYS 114 (Div. 1), CL50 224 (Div. 2 & 3), LILY 1105 (Div. 4 & 5); Lec. 1 - 13** | | |
| 16 | W | 2/19/20 | More 1st law practice | 4.6-4.10 | HW16-2/20 |
| | **F** | **2/21/20** | **No Class Due to Exam 1** | | |
| 17 | M | 2/24/20 | System Integration | 4.11 | HW17-2/27 |
| 18 | W | 2/26/20 | Energy analysis of cycles | 2.6 | HW18-2/27 |
| 19 | F | 2/28/20 | Transient analysis | 4.12 | HW19-3/5 |
| 20 | M | 3/2/20 | Introducing the 2nd law, irreversibilities | 5.1-5.4 | HW20-3/5 |
| 21 | W | 3/4/20 | Thermodynamic cycles and the 2nd law | 5.5-5.8 | HW21-3/5 |
| 22 | F | 3/6/20 | Maximum performance measures | 5.9 | HW22-3/12 |
| 23 | M | 3/9/20 | Carnot cycle, Clausius inequality and their significance | 5.10, 5.11 | HW23-3/12 |
| | **T** | **3/10/20** | **EXAM 2: 8 - 9 pm; PHYS 114 (Div. 1), CL50 224 (Div. 2 & 3), LILY 1105 (Div. 4 & 5); Lec. 1 - 21** | | |
| 24 | W | 3/11/20 | Entropy as a property | 6.1, 6.2 | HW24-3/12 |
| | **F** | **3/13/20** | **No Class Due to Exam 2** | | |
| | | | **Spring Break: March 16-22** | | |
| 25 | M | 3/23/20 | T-ds relations, entropy change for incompressible substances | 6.3, 6.4 | HW25-3/26 |
| 26 | W | 3/25/20 | Entropy change for ideal gases | 6.5 | HW26-3/26 |
| 27 | F | 3/27/20 | Internally reversible processes, 2nd law without mass flow | 6.6, 6.7 | HW27-4/2 |
| 28 | M | 3/30/20 | Entropy increase principle, 2nd law with mass flow | 6.8.1, 6.9 | HW28-4/2 |
| 29 | W | 4/1/20 | 2nd law practice | 6.10 | HW29-4/2 |
| 30 | F | 4/3/20 | Isentropic processes | 6.11 | HW30-4/9 |
| 31 | M | 4/6/20 | Device isentropic efficiencies | 6.12 | HW31-4/9 |
| 32 | W | 4/8/20 | Heat transfer and work in reversible flow processes | 6.13 | HW32-4/9 |
| 33 | F | 4/10/20 | Vapor power systems, Rankine cycle | 8.1, 8.2 | HW33-4/16 |
| 34 | M | 4/13/20 | Rankine cycle improvements | 8.3 | HW34-4/16 |
| | **T** | **4/14/19** | **EXAM 3: 8 - 9 pm; EE 129 (Div. 1), CL50 224 (Div. 2 & 3), LILY 1105 (Div. 4 & 5); Lec. 1 - 32** | | |
| 35 | W | 4/15/20 | Vapor compression refrigeration systems | 10.1, 10.2 | HW35-4/16 |
| | **F** | **4/17/20** | **No Class Due to Exam 3** | | |
| 36 | M | 4/20/20 | Heat pumps | 10.6 | HW36-4/23 |
| 37 | W | 4/22/20 | Air standard cycles, I.C. engines | 9.1-9.4 | HW37-4/23 |
| 38 | F | 4/24/20 | Otto, diesel, dual cycles | 9.1-9.4 | HW38-4/30 |
| 39 | M | 4/27/20 | Brayton cycle | 9.5 | HW39-4/30 |
| 40 | W | 4/29/20 | Brayton cycle improvements | 9.6 | HW40-4/30 |
| 41 | F | 5/1/20 | Course review | | |
| | | | **Final Examination: Lectures 1 - 41, HW1 - HW40** | **Time and Location TBD** | |