Physics 211 **Classical and Modern Physics** **Fall 2024**

Lecture Schedule and Reading Assignments

Reading assignments by default refer to chapters and sections of your text ESSENTIAL UNIVERSITY PHYSICS, Fourth Edition, by Richard Wolfson. For example, "9-2" refers to Section 9-2 in Wolfson. "Supplementary Reading" refers to the Physics 211 *Supplementary Reading* book. "Ex" refers to Example problems given in sections of the text and "Fig" refers to Figures.

Unit 1: Classical Mechanics

- August 27, Tuesday
  Lecture 1: One-Dimensional Kinematics
  Read: 2-1, 2-2, 2-3
  Study: Ex 2.1; Figs 2.4, 2.5; Got It 2.2; Ex 2.2; Fig 2.7

- August 29, Thursday
  Lecture 2: Two- and Three-Dimensional Motion
  Read: 3-1, 3-2, 3-3, 3-6
  Study: Figs 3.1, 3.2, 3.4; Ex 3.1; Got It 3.2; Figs 3.7, 3.8, 3.9; Exs 3.2, 3.7, 3.8

- September 3, Tuesday
  Lecture 3: Newton's Laws
  Read: Chapter 4 (all of it)
  Study: Tip on p. 57; Got It 4.2; Ex 4.2; Tactics 4.1; Problem Solving Strategy 4.1; Ex 4.3; Fig 4.14; Ex 4.5

- September 5, Thursday
  Lecture 4: Newtonian Dynamics
  Read: Chapter 5; Supplementary Reading CH 1
  Study: Exs 5.1, 5.2, 5.4, 5.5, 5.6, 5.11
  Ignore: Exs 5.8, 5.9, 5.10 (we'll discuss static friction, but we won't use μ_s)

- September 10, Tuesday
  Lecture 5: Work and Energy
  Read: Chapter 6 (typo correction: the second paragraph on p. 95 should begin "Here in Part 1, we'll focus on *mechanical energy*, associated with **motions and configurations** of macroscopic objects such as cars, . . . ")
  Study: Figs 6.3, 6.4; Exs 6.1, 6.2, 6.4; Fig 6.15; Eq 6.14; Ex 6.6
  Ignore: "Power and Velocity" on p. 107

- September 12, Thursday
  Lecture 6: Conservation of Mechanical Energy
  Read: 7-1, 7-2, 7-3, "Non-conservative Work and Energy" handout, 7-6.
  Study: Exs 7.1, 7.4, 7.5; Eq H.4; Ex H.1; Fig 7.10
  Ignore: Sections 7-4, 7-5

- September 17, Tuesday **Lecture 7: Classical Mechanics Problem Solving and Review**
  No new reading or study assignments!

- September 19, Thursday **TEST 1**

Unit 2: Momentum, Relativity, and Rotations

- September 24, Tuesday **Lecture 8: Momentum Conservation**
  Read: 9-2 thru 9-6 (stop at "Elastic Collisions in Two Dimensions" on p. 167)
  Study: Ex 9.5; Got It 9.4; Exs 9.7, 9.8

- September 26, Thursday **Lecture 9: Basic Postulates of Einstein's Theory of Relativity**
  Read: Supplementary Reading CH 2
  Study: boxed text; Exs 2.1, 2.2, 2.3; Eq 2.3; Ex 2.4; Eq 2.7.

- October 1, Tuesday **Lecture 10: Relativistic Spacetime**
  Read: Supplementary Reading CH 3
  Study: Exs 3.1, 3.2; Fig 3.1; comments on p. 75; Ex 3.3; rules on p. 78; Ex 3.4

- October 3, Thursday **Lecture 11: Relativistic Momentum and Energy**
  Read: Supplementary Reading CH 4
  Study: Exs 4.1, 4.2, 4.3, 4.4; Table 4.1

- October 8, Tuesday **Lecture 12: Relativistic Conservation Laws**
  Read: Supplementary Reading CH 5
  Study: Ex 5.1; Fig 5.3

- October 10, Thursday **Lecture 13: Rotational Dynamics**
  Read: Chapter 10
  Study: Ex 10.1; Figs 10.5, 10.6, 10.7; Exs 10.3, 10.4, 10.8; Fig 10.22; Ex 10.12
  Ignore: Constant acceleration formulas in Table 10.1; Exs 10.2, 10.5, 10.6, 10.7

- October 15, Tuesday **FALL BREAK**

- October 17, Thursday **Lecture 14: Angular Momentum**
  Read: Chapter 11
  Study: Figs 11.1, 11.2, 11.4; Ex 11.1; Fig 11.6; Conceptual Ex 11.1; Fig 11.8

- October 22, Tuesday **Lecture 15: Relativity and Rotations Problem-Solving and Review**
  No new reading or study assignments!

- October 24, Thursday **TEST 2**

Unit 3: Oscillations and Thermodynamics

- October 29, Tuesday **Lecture 16: Oscillations**
  Read: Chapter 13
  Study: Ex 13.1; Figs 13.5, 13.6, 13.7; Ex 13.2; Figs 13.19, 13.20

- October 31, Thursday **Lecture 17: Thermal Energy and Solids**
  Read: Supplementary Reading CH 6
  Study: Boxed text; Figs 6.1, 6.3, 6.5; Eq 6.21; Ex 6.2; Eqs 6.28, 6.29; Exs 6.3, 6.4.

- November 5, Tuesday **Lecture 18: Liquids, Gases, and Phase Transitions**
  Read: Supplementary Reading CH 7
  Study: Fig 7.1; Ex 1; Eq 7.23; Exs 4, 6; Eq 7.38; Exs 7, 8.

- November 7, Thursday **Lecture 19: First Law of Thermodynamics and Gas Processes**
  Read: Supplementary Reading CH 8

- November 12, Tuesday **Lecture 20: Second Law of Thermodynamics and Entropy**
  Read: Supplementary Reading CH 9
  Study: Boxed text; Ex 9.1; Eq 9.4; Ex 9.2; Fig 9.3; Eqs 9.7, 9.8; Fig 9.5; Eq 9.11; Ex 9.3.

- November 14, Thursday **Lecture 21: Heat Engines**
  Read: Supplementary Reading CH 10
  Study: Eqs 10.4, 10.6; Exs 10.1, 10.2; Fig 10.2; Exs 10.3, 10.4, 10.5

- November 19, Tuesday **Lecture 22: Thermodynamics/ Oscillations Problem-Solving and Review**
  No new reading or study assignments!

- November 21, Thursday **TEST 3**

- November 26, Tuesday **THANKSGIVING BREAK**

- November 28, Thursday **THANKSGIVING BREAK**

Unit 4: Gravitation and General Relativity

- December 3, Tuesday — **Lecture 23: Kepler and Newton's Gravity**
  Read: 8-1, 8-2, 8-3
  Study: Eq 8.1; Ex 8.1; Eq. 8.4; Fig 8.5

- December 5, Thursday — **Lecture 24: Gravitational Energy and Curved Spacetime**
  Read: 8-4, Supplementary Reading CH 11-1, 11-2, and 11-3.
  Study: Eq 8.6; Ex 8.5; Supp. Eqs 11.1, 11.5; Fig 11.2

- December 10, Tuesday — **Lecture 25: General Relativity**
  Read: Supplementary Reading CH 11-4 thru 11-7

- TBA — **FINAL EXAM**