

TABLE OF CONTENTS

Licensing

2.1: Introduction and Review

- 2.1.1: Introduction and Review
- 2.1.2: Scaling and Order-of-Magnitude Estimates
- 2.1.3: Footnotes
- 2.1.4: Problems

2.2: Conservation of Mass

- 2.2.1: Mass
- 2.2.2: Equivalence of Gravitational and Inertial Mass
- 2.2.3: 1.3 Galilean Relativity
- 2.2.4: A Preview of Some Modern Physics
- 2.2.5: Footnotes
- 2.2.6: Problems

2.3: Conservation of Energy

- 2.3.1: Energy
- 2.3.2: Numerical Techniques
- 2.3.3: Gravitational Phenomena
- 2.3.4: Atomic Phenomena
- 2.3.5: Oscillations
- 2.3.6: Footnotes
- 2.3.7: Problems

2.4: Conservation of Momentum

- 2.4.1: Momentum In One Dimension
- 2.4.2: Force In One Dimension
- 2.4.3: Resonance
- 2.4.4: Motion In Three Dimensions
- 2.4.5: Footnotes
- 2.4.E: Problems

2.5: Conservation of Angular Momentum

- 2.5.1: Angular Momentum In Two Dimensions
- 2.5.2: Rigid-Body Rotation
- 2.5.3: Angular Momentum In Three Dimensions
- 2.5.4: Footnotes
- 2.5.E: Conservation of Angular Momentum (Exercises)

2.6: Thermodynamics

- 2.6.1: Pressure and Temperature
- 2.6.2: Microscopic Description of An Ideal Gas
- 2.6.3: Entropy As a Macroscopic Quantity
- 2.6.4: Entropy As a Microscopic Quantity

- 2.6.5: More About Heat Engines
- 2.6.6: Footnotes
- 2.6.E: Thermodynamics (Exercises)

2.7: Waves

- 2.7.1: Free Waves
- 2.7.2: Bounded Waves
- 2.7.3: Footnotes
- 2.7.4: Problems

2.8: Relativity

- 2.8.1: Time Is Not Absolute
- 2.8.2: Distortion of Space and Time
- 2.8.3: Dynamics
- 2.8.4: General Relativity (optional)
- 2.8.5: Footnotes
- 2.8.E: Relativity (Exercises)

2.9: Atoms and Electromagnetism

- 2.9.1: The Electric Glue
- 2.9.2: The Nucleus
- 2.9.3: Footnotes
- 2.9.4: Problems

2.10: Circuits

- 2.10.1: Current and Voltage
- 2.10.2: Parallel and Series Circuits
- 2.10.E: Circuits (Exercises)

2.11: Fields

- 2.11.1: Fields of Force
- 2.11.2: Voltage Related To Field
- 2.11.3: Fields by Superposition
- 2.11.4: Energy In Fields
- 2.11.5: LRC Circuits
- 2.11.6: Fields by Gauss' Law
- 2.11.7: Gauss' Law In Differential Form
- 2.11.8: Footnotes
- 2.11.E: Fields (Exercises)

2.12: Electromagnetism

- 2.12.1: More About the Magnetic Field
- 2.12.2: Magnetic Fields by Superposition
- 2.12.3: Magnetic Fields by Ampère's Law
- 2.12.4: Ampère's Law In Differential Form (Optional)
- 2.12.5: Induced Electric Fields
- 2.12.6: Maxwell's Equations
- 2.12.7: Electromagnetic Properties of Materials
- 2.12.8: Footnotes

- [2.12.E: Electromagnetism \(Exercises\)](#)

2.13: Optics

- [2.13.1: The Ray Model of Light](#)
- [2.13.2: Images by Reflection](#)
- [2.13.3: Images, Quantitatively](#)
- [2.13.4: Refraction](#)
- [2.13.5: Wave Optics](#)
- [2.13.6: Footnotes](#)
- [2.13.E: Optics \(Exercises\)](#)

2.14: Quantum Physics

- [2.14.1: Rules of Randomness](#)
- [2.14.2: Light As a Particle](#)
- [2.14.3: Matter As a Wave](#)
- [2.14.4: The Atom](#)
- [2.14.5: Footnotes](#)
- [2.14.6: Problems](#)

[Index](#)

[Glossary](#)

[Index](#)

[Glossary](#)

[Detailed Licensing](#)