

# Table of Contents

<b>Preface</b>	
Richard Wolfson	<b>1</b>
<b>1. Doing Physics</b>	
Richard Wolfson	<b>7</b>
<b>Problem Set (2/e): Doing Physics</b>	
Richard Wolfson	<b>17</b>
<b>Mechanics</b>	
Richard Wolfson	<b>19</b>
<b>2. Motion in a Straight Line</b>	
Richard Wolfson	<b>21</b>
<b>Problem Set (2/e): Motion in a Straight Line</b>	
Richard Wolfson	<b>35</b>
<b>3. Motion in Two and Three Dimensions</b>	
Richard Wolfson	<b>39</b>
<b>Problem Set (2/e): Motion in Two and Three Dimensions</b>	
Richard Wolfson	<b>57</b>
<b>4. Force and Motion</b>	
Richard Wolfson	<b>61</b>
<b>Problem Set (2/e): Force and Motion</b>	
Richard Wolfson	<b>79</b>
<b>5. Using Newton's Laws</b>	
Richard Wolfson	<b>83</b>
<b>Problem Set (2/e): Using Newton's Laws</b>	
Richard Wolfson	<b>101</b>
<b>6. Work, Energy, and Power</b>	
Richard Wolfson	<b>107</b>

Problem Set (2/e): Work, Energy, and Power	121
Richard Wolfson	
<b>7. Conservation of Energy</b>	
Richard Wolfson	125
Problem Set (2/e): Conservation of Energy	
Richard Wolfson	139
<b>8. Gravity</b>	
Richard Wolfson	145
Problem Set (2/e): Gravity	
Richard Wolfson	159
<b>9. Systems of Particles</b>	
Richard Wolfson	163
Problem Set (2/e): Systems of Particles	
Richard Wolfson	183
<b>10. Rotational Motion</b>	
Richard Wolfson	189
Problem Set (2/e): Rotational Motion	
Richard Wolfson	205
<b>11. Rotational Vectors and Angular Momentum</b>	
Richard Wolfson	211
Problem Set (2/e): Rotational Vectors and Angular Momentum	
Richard Wolfson	223
<b>12. Static Equilibrium</b>	
Richard Wolfson	227
Problem Set (2/e): Static Equilibrium	
Richard Wolfson	239
<b>Mechanics Summary</b>	
Richard Wolfson	247
<b>Oscillations, Waves, and Fluids</b>	
Richard Wolfson	249
<b>13. Oscillatory Motion</b>	
Richard Wolfson	251
Problem Set (2/e): Oscillatory Motion	
Richard Wolfson	269
<b>14. Wave Motion</b>	
Richard Wolfson	275
Problem Set (2/e): Wave Motion	
Richard Wolfson	297

<b>15. Fluid Motion</b>	<b>301</b>
Richard Wolfson	
<b>Problem Set (2/e): Fluid Motion</b>	<b>317</b>
Richard Wolfson	
<b>Oscillations, Waves, and Fluids Summary</b>	<b>323</b>
Richard Wolfson	
<b>Thermodynamics</b>	<b>325</b>
Richard Wolfson	
<b>16. Temperature and Heat</b>	<b>327</b>
Richard Wolfson	
<b>Problem Set (2/e): Temperature and Heat</b>	<b>341</b>
Richard Wolfson	
<b>17. The Thermal Behavior of Matter</b>	<b>347</b>
Richard Wolfson	
<b>Problem Set (2/e): The Thermal Behavior of Matter</b>	<b>359</b>
Richard Wolfson	
<b>18. Heat, Work, and the First Law of Thermodynamics</b>	<b>363</b>
Richard Wolfson	
<b>Problem Set (2/e): Heat, Work, and the First Law of Thermodynamics</b>	<b>377</b>
Richard Wolfson	
<b>19. The Second Law of Thermodynamics</b>	<b>383</b>
Richard Wolfson	
<b>Problem Set (2/e): The Second Law of Thermodynamics</b>	<b>401</b>
Richard Wolfson	
<b>Thermodynamics Summary</b>	<b>405</b>
Richard Wolfson	
<b>Electromagnetism</b>	<b>407</b>
Richard Wolfson	
<b>Appendix: Mathematics</b>	<b>409</b>
Richard Wolfson	
<b>Appendix: The International System of Units (SI)</b>	<b>417</b>
Richard Wolfson	
<b>Appendix: Conversion Factors</b>	<b>419</b>
Richard Wolfson	
<b>Physical Constants; The Greek Alphabet; Conversion Factors</b>	<b>421</b>
Richard Wolfson	
<b>Geophysical and Astrophysical Data; Periodic Table of the Elements</b>	<b>423</b>
Richard Wolfson	

Problem Set (2/e): Doing Physics Richard Wolfson	<b>425</b>
Problem Set (2/e): Motion in a Straight Line Richard Wolfson	<b>427</b>
Problem Set (2/e): Motion in Two and Three Dimensions Richard Wolfson	<b>431</b>
Problem Set (2/e): Force and Motion Richard Wolfson	<b>435</b>
Problem Set (2/e): Using Newton's Laws Richard Wolfson	<b>439</b>
Problem Set (2/e): Work, Energy, and Power Richard Wolfson	<b>445</b>
Problem Set (2/e): Conservation of Energy Richard Wolfson	<b>449</b>
Problem Set (2/e): Gravity Richard Wolfson	<b>455</b>
Problem Set (2/e): Systems of Particles Richard Wolfson	<b>459</b>
Problem Set (2/e): Rotational Motion Richard Wolfson	<b>465</b>
Problem Set (2/e): Rotational Vectors and Angular Momentum Richard Wolfson	<b>471</b>
Problem Set (2/e): Static Equilibrium Richard Wolfson	<b>475</b>
Problem Set (2/e): Oscillatory Motion Richard Wolfson	<b>483</b>
Problem Set (2/e): Wave Motion Richard Wolfson	<b>489</b>
Problem Set (2/e): Fluid Motion Richard Wolfson	<b>493</b>
Problem Set (2/e): Temperature and Heat Richard Wolfson	<b>499</b>
Problem Set (2/e): The Thermal Behavior of Matter Richard Wolfson	<b>505</b>
Problem Set (2/e): Heat, Work, and the First Law of Thermodynamics Richard Wolfson	<b>509</b>
Problem Set (2/e): The Second Law of Thermodynamics Richard Wolfson	<b>515</b>

**Appendix: Mathematics**

Richard Wolfson

**519**

**Appendix: Conversion Factors**

Richard Wolfson

**527**

**Index**

**529**