

EASTERN NAZARENE COLLEGE

PY 301 Modern Physics I Spring 2009

Daily Class Schedule

| Date | Topics | Reading Assignment Chapter and Sections |
|---|---|--|
| January 28 | Course Introduction | |
| Module One: The Theory of Special Relativity | | |
| January 30 | Background and Basic Concepts | 1.1, 1.2, 1.4 |
| February 2 | Consequences of Special Relativity | 1.3, 1.5 |
| 4 | Lorentz Transformation and Examples | 1.6, 1.7 |
| 6 | Relativistic Momentum and Energy | 2.1, 2.2, 2.4 |
| 9 | Bind Energy and Elementary Particles | 2.3 (15.1, 15.2, 15.3) |
| 11 | The General Theory of Relativity | 2.5 |
| Module Two: The Quantum Theory of Light | | |
| February 13 | Blackbody Radiation | 3.1, 3.2 |
| 16 | Planck's Theory | 3.3 |
| 18 | Photoelectric Effect | 3.4 |
| 20 | Compton Effect, Wave-Particle Complementarity | 3.6, 3.7 |
| February 27 | Exam#1 covering Modules One and Two | |
| Module Three: The Particle Nature of Matter | | |
| February 23 | The Composition of Matter | 4.1, 2.2 |
| 25 | Rutherford Model of the Atom | 4.3 |
| March 2 | The Bohr Atom | 4.4, 4.5 |
| Module Four: Matter Waves | | |
| March 4 | de Broglie Waves | 5.1, 5.2 |
| 6 | The Heisenberg Uncertainty Principle | 5.3, 5.4 |
| March 9 | Spring Break - March 6, 5:00 PM - March 16, 8:00AM | |
| 16 | The Wave-Particle Duality | 5.5, 5.6, 5.7 |
| 18 | Fourier Series | 5.3 and hand-out |
| 20 | Fourier Transform and Wave Packets | |
| Module Five: Quantum Mechanics | | |
| March 23 | Schroedinger's Equation | 6.1, 6.2, 6.3 |
| 25 | The Infinite Square Well | 6.4, 6.5 |
| 27 | The Quantum Oscillator | 6.6 |
| 30 | Expectation Values | 6.7, 6.8 |
| April 1 | The Square Barrier | 7.1, 7.2, Essay, page 187 |
| April 6 | Exam #2 covering Modules Three, Four, and Five | |
| Module Six: Real World Quantum Mechanics | | |
| April 3 | Particle in a Three-Dimensional Box | 8.1, 8.2 |
| 8 | Hydrogen Atom I | 8.2, 8.3 |
| April 10 | Easter Break – April 9, 5:00PM – April 14, 8:00AM | |

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| | 15 | Hydrogen Atom II | 8.4 |
| | | Module Seven: Multi-Electron Atoms and Molecules | |
| April | 17 | The Spinning Electron | 9.1, 9.2 |
| | 20 | Multi-Electron Atoms | 9.3, 9.4 |
| | 22 | The Periodic Table | 9.5, 9.6 |
| | 24 | Bonding in Molecules | 11.1, 11.2, 11.3, 11.4 |
| | | Module Eight: Statistics and Solids | |
| April | 27 | Classical and Quantum Statistics | 10.2, 10.3 |
| | 29 | Fermi-Dirac Statistics | 10.4 |
| May | 1 | Classical and Quantum Theory of Metals | 12.1, 12.2, 12.3 |
| | 4 | Semiconductor | 12.4, 12.5 |
| | 6 | Semiconductor Devices | |
| May | 8 | Review and maybe Exam #3 (In-Class part) | |
| May | 13 | Exam #3 (In-Class part) and Final Exam at 8:00am in S-27 | |

Have a Great Summer!