Modern Physics

Physics 2305

Fall 2019

Text Book: Modern Physics
Stephen T. Thornton, Andrew Rex

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Room 108, Phone 341-4792

Office Hours 4:00-5:00 Monday, 10:00-12:00 Tuesday

Grading

Homework 40%
Midterms (2) 20% each September 25, October 30
Final 20% Monday, December 9, 10:00 pm

Homework is due Wednesday at the start of class
One homework score will be dropped at end of the course
Use of files from previous semesters is not allowed, and will be severely penalized!

Fundamental Concepts and Applications

Special Relativity
A new idea of time and space
The twin paradox
Quantized Light (Photons)
Black body radiation
Photo-electric effect
Compton scattering
Matter Waves
Probability
Uncertainty
Quantized energy
Atomic spectra
Failure of classical physics
Energy levels
Photo-emission and absorption
Quantum Mechanics
Operators
Schroedinger’s Equation
Eigen States
Superposition
Time evolution
Hydrogen Atom
Full quantum treatment
Electron spin
Multi-electron atoms
Pauli exclusion principle
Shell structure
Magnetic fields

Statistical Mechanics
Classical many body physics
Quantum statistics
Heat capacity
Molecules
Bonds
Rotation
Vibration
Raman scattering
Solids
Crystal structure
Band structure
Conduction
Semi-conductors
Nuclear Physics
Structure
Bonding
Binding energies
Decay
Fusion
Elementary Particles
Fundamental forces
Quarks, Leptons
Antiparticles
Quantum fields

Magnetic fields