

# **Textbooks and Topics for Graduate Qualifying Exam**

## **Department of Physics & Astronomy, University of Alabama**

### **Classical mechanics**

Recommended textbook: John R Taylor, “Classical Mechanics”

Suggested additional reading: Fowles & Cassiday, “Analytical Mechanics”

Topics:

1. Velocity-dependent and position-dependent forces
2. Conservation laws; energy, momentum and angular momentum
3. Oscillations: damped, forced and coupled
4. Lagrangian mechanics
5. Central forces and orbits
6. Mechanics in non-inertial frames
7. Rigid body rotations

### **Electricity & Magnetism**

Recommended textbook: David J. Griffiths, “Introduction to Electrodynamics”

Suggested additional reading: Purcell & Morin, “Electricity & Magnetism”

Topics:

1. Electrostatics and magnetostatics
2. Electric and magnetic fields in matter
3. Conservation laws
4. Electromagnetic waves
5. Radiation
6. Potentials and fields
7. Electrodynamics and relativity