

PHYS 414/823 Course Outline

All chapters refer to *Introduction to General Relativity*
by J. Hartle

- Introduction and Background Material
 - Introduction (§1)
 - Differential Geometry (§2)
 - Newtonian Gravity (§3)
 - Special Relativity (including 4-vectors) (§4-5) Note: Much of this material will be presented in PHYS432 and omitted here. Students not enrolled in PHYS432 should see me.
- Curved Spacetimes and Gravity
 - Gravity as geometry and the equivalence principle (§6)
 - Curved spacetime (§7)
 - Variational principle and the geodesic equation (§3.5, 5.4, 7, 8)
- Geometry outside a spherical star (§9-13)
- The Einstein equation (§20-22)
- Homogeneous and isotropic spacetimes and cosmology (§17-19)