

# Physics 711

## Topics in Particles and Fields (General Relativity)

**Local Instructor:** Jason Kumar  
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**Lecturer:** Pearl Sandick  
University of Utah  
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**Class meets:**  
M W 10:00-11:20am (Daylight Savings Time)  
11:00am-12:20pm (Standard Time)  
WAT 417

**Course Textbook:**  
*Spacetime and Geometry: An Introduction to General Relativity*  
Sean M. Carroll

### Topics to be covered:

This is a graduate level introduction to general relativity. Topics to be covered will include a brief discussion of special relativity, manifolds and elements of differential geometry, curvature, gravitation and Einstein's Equation, the Schwarzschild solution and black holes, and gravitational radiation.

### Grading:

The course grade will be based on homework and exams

60% -- homework  
20% -- midterm  
20% -- final

### Student Learning Outcomes:

By the end of the course:

- 1) Students will develop an understanding of general relativity from both mathematical and physical perspectives.
- 2) Students will be comfortable with calculations involving tensors and differential forms, and will be able to calculate curvature and geodesics and apply the Einstein field equations to simple physical systems.