

# Physics 600

## Methods of Theoretical Physics

**Instructor:** Jason Kumar  
WAT 436  
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**Class meets:**  
T Th 12:00-1:15pm  
WAT 417A

**Supplementary Textbooks:**  
Mathematical Methods of Physics  
Mathews and Walker

**Topics to be covered:**

Generalized Curvature  
Group Theory (Representation Theory)  
Perturbation Theory  
Complex Analysis  
Fourier Analysis

**Grading:**

The course grade will be based on homework and exams  
60% -- homework  
20% -- midterm  
20% -- final

**Student Learning Outcomes:**

At the successful completion of this course, students will be expected to:

- 1) Have an understanding of the general nature of curvature and of its specific application to geometry and gauge-symmetry
- 2) Understand how to use the basic tools and results of representation theory

- 3) Understand methods of perturbation theory, along with basic computations of non-perturbative physics
- 4) Understand the basic tool and techniques of complex and Fourier analysis