

# Physics 777/778

## Nuclear and Particle Physics I/II

**Instructor:** Jason Kumar  
WAT 436  
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**Class meets:**  
T Th 9:00-10:15am  
WAT 417

**Recommended Textbooks:**  
An Introduction to High Energy Physics (4<sup>th</sup> Edition)  
Donald Perkins

Gauge Theories in Particle Physics  
Aitchison and Hey

### Topics to be covered:

An introduction to particle physics

The Standard Model

Hadrons

Supersymmetry and naturalness

Grand Unification

Dark matter

Neutrino physics

Heavy quark physics

Baryogenesis

Cosmic ray physics

### Grading:

The course grade in each semester will be based on in-class presentations (the expected number of presentations is two).

**Student Learning Outcomes:**

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

- 1) Have a working understanding of the particles and interactions of the Standard Model.
- 2) Have a basic understanding of current issues in beyond-the-Standard-Model physics, with a focus on topics which are investigated by research groups at UH.
- 3) Have a basic understanding of the relevance of the above issues to current experiments, with a focus on those in which UH research groups participate.