

Spring 2023 (update in progress)

The course will meet Tu-Th 1:30-2:45 pm, WAT113, and follows the textbook of Alessandro Bettini, "Introduction to Elementary Particle Physics", 2nd Edition, Cambridge University Press with selections from Griffiths, Peskin.

Particle Physics, by D. Carlsmith (2013)

- Tuesday, Jan 10; Chapter 1: "Folk History" of Particle Physics, Preliminary Notions, Special Relativity;
- Thursday, Jan 12; Chapter 1: Special Relativity (Fixed target and colliding beams), cross-section, branching fractions
- Tuesday Jan 17; Chapter 1: Rutherford scattering, Fermi's Golden Rule, Passage of Radiation Through Matter
- Thursday Jan 19; Chapter 1: Sources and Detectors of High Energy Particles
- Tuesday Jan 24; Chapter 2: Nucleons, Leptons and Mesons
- Thursday Jan 26; Leptons and Mesons (cont'd)
- Tuesday January 31, Chapter 3: Symmetries
- Thursday Feb 2, Symmetries (cont'd)

- Tuesday Feb 7: Chapter 4: Hadrons (including the quark model)
- Thursday Feb 9: Hadrons (including the quark model)
- Tuesday Feb 14: Hadrons + QED
- Thursday Feb 17: Chapter 5: Quantum Electrodynamics (QED)
to be updated, 5.3, 5.6, 5.7, 5.11, 5.14, 5.16, 5.17 (Due Date: TBA)
- Tuesday Feb 21, Review for the Midterm
[Practice Problems for the Midterm](#)
- Thursday Feb 23, Midterm 1
- Tuesday March 1, QED, Chapter 6: Quantum Chromodynamics (QCD),
Exercises: to be updated, 6.4, 6.6, 6.9, 6.13, 6.20, 6.24, 6.25 (Due Date: TBA)
- Thursday, March 2 QCD
- Tuesday, March 7, QCD
- Thursday, March 9, QCD
- **March 13-17, Spring Break**
- Tuesday March 21, Chapter 7: Weak Interactions
Exercises to be updated 7.6, 7.17, 7.19, 7.23, 7.26, 7.28, 7.31 (Due Date: TBA)
- Thursday March 24, Weak Interactions
- Tuesday March 29, Weak Interactions
- Thursday, March 31, Chapter 8: Oscillations of Neutral Mesons and CP violation
Exercises: to be updated, 8.1, 8.2, 8.5 8.6, 8.7, 8.9, 8.12 (Due Date: TBA)
- Tuesday April 4, Mixing and CP violation
- Thursday April 6, Chapter 9: The Standard Model
Exercises: to be updated, 9.7, 9.17, 9.22, 9.27, 9.30 (Due Date: TBA)
- Tuesday April 11, The Standard Model Part I
- Thursday April 13, The Standard Model Part I
- Tuesday April 18, The Standard Model Part I
- Thursday April 20, The Standard Model Part II
- Tuesday April 25, The Standard Model Part II
- Thursday April 27, The Standard Model Part II
- Thursday April 27, The Standard Model Part II

- Tuesday May 2, Student Presentations
- Thursday May 4, Student Presentations

There will be a midterm, final exam and 1 oral presentation.
For the midterm and final, a calculator and a notecard are allowed.
There are also regular mini-quizzes (closed book, but calculators are ok).

Grading weights:

Homework Problems (25%)

Midterm (20%)

Quizzes (15%)

Final (40%)

Midterm exam: TBA

(Chapters 1-4, bring one standard size notecard and calculator)

[Practice Final](#) Use this to prepare for the Final exam (TBA)

The final will also include a few simple problems on drawing and calculating Feynman diagrams.

Final exam: Bring crib sheet and calculator

Last modified: Jan 10, 2023

(Check frequently for updates)

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