

General Course Information

PHYS 416 Quantum Field Theory

Course Co-ordinator and lecturer

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Description

The following topics will be covered.

- Classical field theory
- Quantizing Canonically
- Cross sections and decay rates
- Feynman Diagrams
- The Dirac Field
- Gauge Invariance
- Quantum Electrodynamics

Assessment

The final grade will be determined based on:

- Assignments $\times 4$ (10%)
- Tutorial attendance (5%)
- Test (20%)
- Exam (65%)

Pre-requisites

PHYS326 and PHYS411

Textbooks

Main:

- M. D. Schwartz: Quantum Field Theory and the Standard Model (Cambridge University Press).

Supplementary:

- A. G. Williams, "Introduction to Quantum Field Theory", Cambridge University Press (2023).
- D. Tong, "Lectures on Quantum Field Theory", <https://www.damtp.cam.ac.uk/user/tong/qft.html>.
- Robert D. Klauber, "Student Friendly Quantum Field Theory", Sandtrove Press; 2nd ed, (2013)
- W. Greiner, "Field quantization", Springer-Verlag (2000).
- W. Greiner, "Relativistic Quantum Mechanics. Wave Equations", Springer-Verlag (2000).
- M. E. Peskin and D. V. Schroeder, An Introduction to Quantum Field Theory (Perseus Books).

- T. Zee, The Quantum Field Theory in a Nutshell, 2nd ed, (Princeton University Press).
- S. Weinberg, The Quantum Theory of Fields, Vol 1, (Cambridge University Press).