

PHYSICS 7315
Quantum Field Theory II
TuTh 2:00 AM-3:20 pm
Dallas Hall Room 155 Spring 2021 2020

INSTRUCTOR Roberto Vega
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OFFICE By arrangement.
HOURS

Suggested Texts *The Standard Model: A Primer* by Cliff Burgess and Guy Moore, *The QUantum Theory of Fields V. I* by Steven Weinberg, *QUantum Field Theory and the Standard Model* by Matthew D. Schwartz., or *Principles of Quantum Mechanics* *QUantum Field Theoey* by Mark Srednicki.

GRADING The final course grade will be determined a follows. Homework 75%, exams 25%.

Objectives:

This is the second part of a two semester course on Quantum Field Theory. As in part one we will closely follow the Burgess textbook and extend some of the discussions with material from Weinberg's textbook.

For this second part of the course we will discuss non-abelian gauge theories and introduce the Standard Model of Particles Physics. Students will learn how to perform tree level calculations in the Standard Model.

Learning Outcomes:

Upon completion of this course students should be able to:

- Have a basic understanding of the principles of Quantum Field Theory, including the understanding of a quantum field and its necessity.
- Have an understanding of the Standard Model including the underlying group structure, particle content, broken and unbroken symmetries and their consequences.
- Derive the Feynman rules for QED and the Standard Model.
- Compute tree level calculations of Feynman diagrams.