PHYSICS 7314

Quantum Field Theory I
MWF 10:00 AM-10:45 AM
Dallas Hall Room 157 Fall 2020

INSTRUCTOR Roberto Vega
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OFFICE HOURS By arrangement.

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 MechanicsQuantum Field Theoey* by Mark Srednicki.

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

Objectives:

This course is part one of a two semester course on Quantum Field Theory. We will closely follow the Burgess textbook and extend some of the discussions with material from Weinberg's textbook.
Quantum Field theory is the outcome of the marriage of Non-relativistic Quantum Mechanics and Special Relativity into a consistent formalism. We will delve somewhat lightly into the principles of QFT with the goal of getting into the details of the Standrd Model as soon as possible. I expect we will cover the entire textbook in this two semester sequence.

Learning Outcomes:

Upon completion of this course students shoud 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 Mdoel.
- Compute tree level calculations of Feynman diagrams.