

# Quantum Field Theory II (663), Fall 2014

Lectures: Mondays and Wednesdays from 3:30pm to 4:45pm in room PHYS234.

Instructor: Martin Kruczenski, e-mail:markru@purdue.edu, Office: PHYS274.

Textbook: “An Introduction to Quantum Field Theory” by M. Peskin and D. Schroeder. Lecture notes can be downloaded from the course webpage as the course progresses. Many good books are available and contain the same material

Course Webpage: <http://web.ics.purdue.edu/~markru/>

Homework: Homework will be given every other week. The deadline is one week after the problems are given. Homework is not graded but will be checked to give feedback.

Exams: No exams.

Final grading: Final grade is based on special homework problems given along the course. Those problems are more difficult than the regular homework.

## Contents of the course

The intention is to go over parts II and III of the book. This course should be considered together with 662 as a way to cover most of the book material. Some topics will be left for homework and others will have to be skipped because of time constraints. In 663 we include the following topics:

**Non-abelian gauge fields** Classical action, non-abelian groups. Quantization of gauge fields (BRST method). Strong and electroweak interactions as gauge theories. (from Ch. 15, 16, 17, 20)

**Renormalization** Systematics of renormalization, the renormalization group. (from Part II of the book)

**Renormalization of gauge theories** Renormalizability of gauge theories including spontaneously symmetry breaking case. Beta function. (from Ch. 16, 21)

**Extra topics** If time permits other topics can be included such as anomalies, confinement, Operator product expansion, deep inelastic scattering etc. (from Ch. 17, 18, 19)