PHY 8860 - QFT II — Syllabus

Gil Paz — Winter 2018

Lecturer:

Prof. Gil Paz, Room 360 Physics Building

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Lecture Time:

Tuesday and Thursday, 10:00 AM - 11:15 AM, Room 177 Physics Building.

Suggested Text:

- Michael E. Peskin and Dan V. Schroeder, An Introduction To Quantum Field Theory.
- Various review papers

Office Hours:

Tuesday and Thursday, 11:30 AM -12:30 PM or by appointment.

Grading:

- Homework (70% of the total grade). Weekly assignments will be handed each Thursday. They must be handed back after two weeks in the Thursday lecture. The deadline is *firm*. Late homework will not be accepted. You should submit 80% of the homework to get a passing grade.
- Final project (30% of the total grade). The final project will consist of a short paper $\approx$ 5 pages + 20 minutes talk at the end of the semester. The topic should be chosen from a list of projects I will provide.

Grade: The grade scale is as follows:

Letter grade	**Score**	**Letter grade**	**Score**
A	91-100	B−	70-74
A−	85-90	C+	65-69
B+	80-84	C	60-64
B	75-79	F	< 60

Topics:

Main:

- Radiative Corrections: Formal aspects
- Renormalization
- Path Integrals
- Non-abelian gauge theories
- Operator product expansion

If time permits:

- Anomalies
- Spontaneous symmetry breaking

Learning outcomes:

At the end of the course you should be able to

- Calculate one-loop integrals
- Perform one-loop renormalization in different renormalization schemes
- Quantize non-abelian gauge theories using path integrals
- Calculate one-loop renormalization group equations for different theories
- Understand local and non-local operator product expansion