PHY665: Quantum Field Theory
Winter 2014

Text: Srednicki: Quantum Field Theory

Other references: There are many: I'll suggest additional references as we proceed.

Instructor: Prof. Graham Kribs

Office: 470 Willamette Hall

Office Hours: Anytime my door is open. I'll set office hours for questions on homework assignments in class week-by-week.

E-mail: kribs@uoregon.edu
(This is the best way to reach me)

Class Website: http://wingate.uoregon.edu/Courses/phy665
(Announcements, homework, solutions, syllabus, etc.)

Homework: Homework will be assigned periodically and due roughly one week later. There will be one homework assignment due either the last week of classes and/or the exam week.

Grade: 100% Homework

Grading Policy: Pass (A- and above): All or virtually all problems of all homework assignments done correctly and turned in on-time.
Pass (B- and above): A solid attempt on virtually all problems of all homework sets turned in on-time.
Fail (C+ and below): Habitually late homework, > 1 missed homework sets, several missed or incorrect problems on several problem sets.

Late Homework: Homework turned in more than 6 hours after the due date/time is not accepted without prior approval from me. Any variation in this policy is at my discretion; contact me well in advance (or have a documented medical emergency).

Class Cancellation: In the unlikely event that I have to cancel class at the last minute (bad weather or otherwise), I will attempt to email everyone.
Syllabus

This course is the second quarter of a three-quarter sequence on Quantum Field Theory. In this term we will do fermions and gauge theory at tree-level, i.e., quantum electrodynamics.

A rough outline of the plan:

(33-35) Representations of Lorentz Group; Spinors; 2-Component
(36) Lagrangian for 2- and 4-Component Spinors
(37) Canonical Quantization (u,v, and Dirac eq)
(38-41) Spinor technology; operators; LSZ
(42) Propagator
(43-44) Fermion Path Integral
(45-47) Feynman rules; spin sums; traces
(54-59) Photons, Feynman rules, QED
(62-64) Radiative corrections (time permitting)

The main goal of the course is to build up the foundations of fermions and photons of QFT so that you can calculate tree-level scattering processes in QED. Depending on time and interest, various more advanced topics will be introduced.

Comments on Homework Grading

Please write clearly, legibly, and organize your solution. Don’t be afraid to waste paper to ensure your solution can be clearly followed, step-by-step.

It is highly preferred that you use one-side of the paper, and start new problems and/or parts of problems on new pages.