Instructor:	Laurence G. Yaffe
Office:	B404
TA:	Rob Schabinger, schabr@u, 685-2227, B427
Class:	**11:30–12:20 am** MWF and 1:30-2:30 F, room A114
Homework:	Approximately bi-weekly assignments
Web site:	`http://courses.washington.edu/ph570/`

Tentative Syllabus:

Free relativistic bosons Spinless particles and quantized scalar fields, Lorentz invariance, Feynman propagators, charged fields, free photons

Free relativistic fermions Quantized spinor fields, Dirac equation, Charge conjugation and antiparticles, massless fermions & neutrinos.

Interacting scalar fields $\lambda\phi^4$ theory, interacting particles, spectral representations, cross sections and scattering amplitudes, particle production, unstable particles.

Functional integrals Path integrals, generating functionals, time-ordered correlation functions, Grassmann integration, Euclidean functional integrals.

Diagrammatic perturbation theory Saddle point expansions, Feynman rules, connected and 1PI diagrams.

Basic renormalization Ultraviolet and infrared cutoffs, physical *vs.* bare parameters, mass and coupling renormalization, renormalizable theories.

Books:

The primary textbook will be *Quantum Field Theory* by Mark Srednicki.
Other books recommended for certain topics include the following:

A. Zee, *Quantum Field Theory in a Nutshell.* Breezy presentation, broad but not overly detailed.

L. Brown, *Quantum Field Theory.* Good introduction to modern methods (but doesn't cover non-Abelian theories).

M. Peskin and Schroeder, *Introduction to Quantum Field Theory.* Good introduction to relativistic QFT.

Itzykson & Zuber, *Quantum Field Theory.* Encyclopedic, authoritative, old-fashioned.

L. Ryder, *Quantum Field Theory.* A highly simplified version of Itzykson & Zuber. Watch out for various confused (& confusing) arguments.

Most of the above books are on reserve in the physics library.