School of Mathematics

Course 444 — Relativistic Quantum Mechanics 2002-03
(SS Theoretical Physics, SS Mathematics)

Lecturer: Prof. Samson Shatashvili

Requirements/prerequisites: 441, 432

Duration: 21 weeks

Number of lectures per week: 3

Assessment: Regular assignments.

End-of-year Examination: One 3-hour examination

Description: Elements of classical field theory, The Klein-Grodon (KG) field in space-time, quantization of KG field, the Dirac field, quantization of Dirac field, interacting fields and Feynman diagrams, Feynman rules for quantum electrodynamics (QED), elementary processes of QED, S-matrix, crossing symmetry, radiative corrections, infrared divergencies, Lehman-Symanzik-Zimmerman reduction formula, the Optical theorem, the Ward-Takahashi identities, renormalization of electric charge.
Textbook: Michael E. Peskin and Daniel V. Schroeder, An introduction to Quantum Field Theory, Adison-Wesley, 1995.

April 15, 2003