Quantum Field Theory II
Lecture Course
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56 hours, 28 Lectures.

1) Introduction: Quantization of scalar field
2) In-, Out- states and asymptotic theory
3) S-matrix and Reduction Formulas, Correlation functions
4) Functional integrals: Scalar fields
5) Functional integrals: Correlation functions and Green functions
6) Feynman propagator: scalar case
7) Generation function and interaction for scalar case
8) Feynman diagrams in scalar case
9) Generation function for connected graphs
10) Legendre transformation and effective action
11) Grassmann variables and functional integral for fermions
12) Diagrammatics: scalar case
13) Diagrammatics: QED
14) Loop Expansion and divergences, degree of divergences
15) Dimensional regularization: main rules and integrals
16) One loop divergences in scalar case
17) One loop renormalization in scalar case
18) Renormalization group method
19) QED: one loop diagrams and dimensional regularization
20) Gauge invariance and transversality of photons
21) Gauge invariance: Nonabelian case, Faddeev-Popov quantization
22) QED: one loop renormalization in details.
23) QED: renormalizability Word ıdentity and gauge symmetry
24) Nonabelian gauge theory: one loop diagrams.
25) Beta function and asymptotical freedom, comparison with QED
26) BRST Symmetry and renormalizability in nonabelian case
27) Conserved currents, chiral fermions and Chiral anomaly
28) Trace anomaly and link to quantization in curved space, Conclusion