

FIELDS AND PARTICLES

[Jon Urrestilla, Joanes Lizarraga]

Symmetries: Global and Local symmetries. Spontaneous symmetry breaking. Goldstone bosons.

Higgs mechanism.

Electroweak Theory.

Topological Defects: Domain walls, cosmic strings, magnetic monopoles.

Early Universe: Overview of the thermal history of the universe. Early universe thermodynamics.

Brief introduction to a selection of other topics that include:

QCD.

Supersymmetry.

Dark Matter.

Dark Energy.

Inflation.

Bibliography

M. E. Peskin and D. V. Schroeder, *An introduction to quantum field theory.*

W. N. Cottingham and D.A. Greenwood, *An introduction to the standard model of particle physics.*

F. Halzen and A. D. Martin, *Quarks & Leptons: An introductory course in modern particle physics.*

E. Kolb and M. Turner, *The early universe.*

A. Vilenkin and E. P. S. Shellard, *Cosmic strings and other topological defects.*

Assessment by **oral presentation and written final exam.**