Module: Elective Advanced Lectures: Theoretical Physics

Module No.: physics70c

Course: Critical Phenomena (T)

Course No.: physics756

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	3+2	7	ST

Requirements for Participation:

Preparation:
Advanced quantum theory (physics606)
Theoretical condensed matter physics (physics617)

Form of Testing and Examination:
Requirements for the examination (written): successful work with the exercises

Length of Course:
1 semester

Aims of the Course:
Acquisition of important methods to treat critical phenomena

Contents of the Course:
Mean Field Approximation and its Improvements
Critical Behaviour at Surfaces
Statistics of Polymers
Concept of a Tomonaga-Luttinger Fluid
Random Systems
Phase Transitions, Critical Exponents
Scale Behaviour, Conformal Field Theory
Special Topics of Nanoscopic Physics

Recommended Literature:
J. Cardy, Scaling and Renormalization in Statistical Physics (Cambridge University Press, 1996)
A. O. Gogolin, A. A. Nersesyan, A.N.Tsvelik; Bosonisation and strongly correlated systems (Cambridge University Press, 1998)