SYLLABUS

Quantum Mechanics and Monte Carlo Methods 7.5 credits F7003T

Kvantmekanik och MonteCarlo Metoder

Course syllabus admitted: Autumn 2009 Sp 1 - Autumn 2009 Sp 2

DECISION

The syllabus was established by the Department of Applied Physics and Mechanical Engineering 2007-02-28, and remains valid from autumn 2007.

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LULEÅ TEKNISKA UNIVERSITET

Quantum Mechanics and Monte Carlo Methods 7.5 credits F7003T

Kvantmekanik och MonteCarlo Metoder

Second cycle, F7003T

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Fysik	Physics

Entry requirements

Basic course in Quantum Physics and Statistical Mechanics.

Selection

The selection is based on 30-285 credits

Examiner

Niklas Lehto

Course Aim

After the course, the student should be able to:
- Calculate and understand properties of quantum mechanical systems and processes.
- Write Monte Carlo programs and interpret results

Contents

Matrix representation, Spin, Addition of angular momentum, bra-ket, Ladder operators, Perturbation theory, Many particle systems, Mean field theory, Critical exponents, Scaling theory, Monte-Carlo methods, Diffusion,

Realization

Teaching will be performed as lessons. A larger computer homework assignments will be handed out.

Examination

Written exam at the end of the course, mandatory oral presentation of one homework assignment at a poster session. There can be alternative examination methods.

Overlap

The course F7003T is equal to MTF133

Literature. Valid from Autumn 2008 Sp 1

Kvant Mekanik: B. H. Bransden & C. J. Joachain, Quantum Mechanics 2ed 2000, Prentice Hall ISBN 0582-35691-1.
Statistisk mekanik: Thermal Physics av Charles Kittel and Herbert Kroemer, Freeman (1980), med förbehåll för ändringar.

Nordling C., Österman J., Physics Handbook, Studentlitteratur, ISBN: 9144044534 (upplaga 8, 2006) alternativt 9144031521 (2004), eller motsvarande.

Course offered by

Department of Engineering Sciences and Mathematics

Items/credits

Number	Type	Credits	Grade
0001	Written exam/Assignment report	4.5	G U 3 4 5
0002	Seminar assignment	3	U G#

Last revised

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