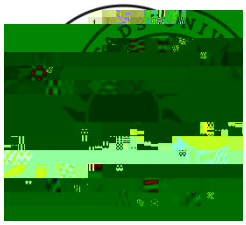

Faculty of Health, Science and Technology
Physics

Course Code: 2FYS015
Course Title: Connections.ss7.821biS 11.04 -0 0 11.04 85.08 443.16 Tm [(C)-7.4 (o)0.6 (u)-1.9 (r)
Teaching is mainly in Scandinavian languages and English, depending on the lecturer´s natural language. If there are participants unfamiliar with Scandinavian languages English is used as the course language.

Prerequisites

Admission to doctoral studies in physics or mathematics, or a Master's degree in physics or mathematics, or equivalent.

Learning Outcomes

The goal of the course is to introduce advanced methods and concepts which connect various areas of modern mathematics and modern quantum physics, in a way that makes them accessible to PhD students both in mathematics and in physics.

After completion of the course the student is expected to be able to

- give a detailed account of advanced aspects of the representation theory of finite groups;

- give an account of notions from the theory of vertex operator algebras, modular forms and Calabi-Yau manifolds;

- give an account of number theoretic aspects of conformal field theory;

- perform standard calculations on modular forms, representations of finite groups and integrable representations of Kac-Moody algebras;

- give an outline of the connections between the monster group, modular functions and structures in conformal field theory, as well as between Mathieu groups and K3 surfaves;

- interpret and critically scrutinize considerations in favor of such connections.

on. The result of the evaluation is collated and made available in accordance with *The Higher Education*