

Rapport Emneevaluering

Dato: 27.08.2024
Emne: PHYS204
Semester: Spring 2024
Emneansvarlig: Johannes Fiedler
Antall år som emneansvarlig: 1
Øvrig undervisningspersonell: Reza Azad Gholami (Teaching assistant)

Antall studenter oppmeldt til eksamen: 5

Antall bestått: 4

Studentevaluering:

Antall distribuert til: 9

Antall besvarte: 4

Gjennomføring:

The course "PHYS204 - Classical Mechanics and Special Relativity" is a standard course in theoretical physics, and thus, its main content is the mathematical formulation of mechanical physical problems, particularly involving constraints of motions, on different theoretical levels. During the lecture, I focused on showing the relations of the theory to (a) the real world, (b) quantum mechanics, (c) classical and quantum field theory, (d) solid-state physics, (e) engineering, (f) structural physics and (g) economics. Hence, the primary teaching method was blackboard lectures and weekly exercises. The active participation of the students during the lectures was achieved by developing the teaching content in class conversations. The students were supposed to present their solutions to study mates during the tutorials and training, on the one hand, their skills to present their results and, on the other hand, improve their skills by receiving feedback from peers. There were two assignments during the lecture the students had to pass. One was formulated as an exercise sheet, and the second as a research project, providing the students with some freedom to tackle the issue. These projects had to be presented as a talk. At the end of the course, there was a written five-hour exam marked with the standard 40% to pass limit. The marks are equally distributed: each was achieved once (A, B, D, E, F).

Endringer fra forrige gang:

This term, I tried the research-project-orientated assignment for the first time. I developed six research projects around a single topic with different ratios of analytical and numerical contributions, from pure analytic via equally balanced to pure numerical. The feedback I received for this part was very positive. On the one hand, the students appreciated the freedom to try solutions independently. On the other hand, the diversity of the topics allowed them to experience the model development for complex

systems. This part of the lecture worked quite well. However, such an activity requires a high degree of personal responsibility from the students, which only some are able to achieve. Additionally, I started the course differently by introducing d'Alembert's principle and the Lagrange multiplier to introduce different types of constraints. These are more general and can be used to derive the established Lagrange formalism, but they also demonstrate the connection of theoretical mechanics to economics and engineering.

Studentevaluering:

Overall, the students evaluated the course as okay according to the student evaluation. The content and the teaching method were evaluated on average. Only one student had negative feedback, but nothing constructive.

Faglærers vurdering:

The course focused on the mathematical formulation of mechanical problems with constraints, exploring connections to fields like quantum mechanics, engineering, and economics. Teaching methods included blackboard lectures, weekly exercises, and active student participation through in-class discussions and presentations. Students completed two major assignments: an exercise sheet and a research project, which was a new addition this term and received positive oral feedback for allowing independent problem-solving and diverse topic exploration. However, it required high personal responsibility, which was challenging for some students. Overall, the course was evaluated as average, with mixed feedback.

Forbedringstiltak:

Deviating from the curriculum to introduce Lagrange multipliers is suitable. It should be added to the regular course content because it is a higher principle used for several problems outside the scientific community, where most students will get a job after their studies. On the personal side, when I teach this lecture again, I will create a script from my lecture notes.