Training for the International Physicists' Tournament

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Background

The International Physicists' Tournament (IPT) is an annual physics competition for bachelor and master students in teams of six. Participation consists of the scientific investigation and presentation of up to 17 physics problems. The investigations are done during the study year and the presentations during a conference week in Spring. Chalmers has a strong tradition of participation (2014 – 2019 & 2021) and the IPT was hosted at Chalmers in 2017.

Entry requirements

The IPT's problems are postulated in such a way that they are easily understandable, but require creativity and an understanding of physics to solve. Thus, students accepted to Chalmers' or GU's physics program are encouraged to apply. Because at most 6 students can participate, students will be ranked in admissibility based on a written assignment.

Course purpose

This course aims to provide supervision to students representing Chalmers in the IPT. Participating in the IPT allows students to learn about the work cycle and thinking of a scientist and it is therefore a great early career experience. As an additional benefit, the success of the Chalmers team in an international physics competition strengthens our reputation and provides the participants with an opportunity to travel and interact with international peers.

Learning outcomes

This course focuses in developing the students' ability to formulate research questions and communicate scientific results. After completion of the course the student should be able to

Understanding of physics

1. identify the controlled and dependent parameters in a physical system.
2. formulate a research question expressed in physical system parameters.
3. efficiently search for and read scientific articles on a specific topic.
4. evaluate a hypothesis by comparing its predictions with experiments.

Written communication

5. write a well structured slide deck presenting scientific results.
6. understand the anatomy of a scientific article and how to read it.
7. participate in group writing of an IMRaD-style scientific article.

Oral communication

8. give a short oral presentation summarizing scientific results.
9. oppose such a presentation held by another speaker with arguments.
10. be able to critically discuss their research in an open forum.

Course structure

There are six course components:

1. Research period 1
2. Research period 2
3. Midway competition, being either
   (a) a national competition against other universities, if possible.
   (b) a mock competition within the university, otherwise.
4. Written scientific report
5. Research period 3
6. Final examination, being either
   (a) the International Physicists' Tournament, if possible.
   (b) a seminar day in which every student presents, otherwise.

Research periods The research periods roughly align with the study periods. During a research period the students work in pairs to solve a problem of their choosing out of the 17 available. The supervisors assist by providing experimental equipment, setting clear goals, and criticizing presentations.

National competition A national competition takes place in January if two or more Swedish universities want to send a team to the IPT. The competition typically consists of two "Physics Fights" in which every team presents their work on a problems. Jury members grade all participants.

Internal competition As a substitute for the national competition, it is possible to split the Chalmers team into two, and have a competition between the two halves. The internal competition should otherwise be as similar to the national competition as possible.

Grading

Students are scored 1 (pass) or 0 (fail) on each of the six course components. The total score is sum of the course components, with the final examination being mandatory. If the total score is bigger than three the student passes with grade equal to the score. In other words, students must pass the final examination and at least three of the other components to pass.

Additional information

Credits:	7.5 points
Course code:	FUF060
Study time:	personalized all-year
Study rate:	12.5%
Grading:	U/3/4/5
Participants	2 – 6
Contact:	Victor H. González and Åke Andersson sweden@iptnet.info
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Prerequisites	Accepted to Chalmers' or GU's physics program
Selection	Based on written assignment