

COURSE ANALYSIS, graduate course

Postgraduate Program, School of Electrical Engineering, KTH

An asterix (*) denotes non-compulsory data.

Course data

Course name	Fusion research
Course ID	ED3320
Credits	8 hp
Time period for course	VT2020
Teachers	Lorenzo Frassinetti (lorenzo.frassinetti@ee.kth.se)
Classroom hours	6 x 2
Nr of registered students	3
Examination rate, in %	3 students have so far examined the course.

Goals

Global course goals	<p>When completing the course, the student should be able to</p> <ul style="list-style-type: none">• Give an account of fusion reactions and conditions for fusion energy production and explain different experimental approaches to fusion• Discuss reactor power balance and thermal stability• Derive and discuss MHD tokamak instabilities from the Energy principle and give an account of current stability issues for tokamaks• Assess confinement and experimental confinement scalings• Discuss limits of operations for magnetic fusion devices and discuss the value of non-tokamak approaches to magnetic fusion• Give an account of important experiments around the world• Explain the basic principles of inertial fusion and the status of research• Give an account of the safety and environmental aspects of fusion• Discuss the motivation for fusion energy research in a global perspective
How the course design helps fulfill these goals	<p>The course is given as a set of six meetings. In each meeting a student is in charge of preparing and presenting a 1h introduction to the main topic. The other students are expected to have studied the corresponding sections of the course and to have prepared questions to discuss jointly in the second hour.</p> <p>Feedback on the quality of the presentation is provided before each meeting. The presenting student is expected to</p>

implement the feedback before the meeting. The student in charge of presenting the introduction is different in every meeting.

The students that are not presenting are supposed to prepare by the end of the course a 4 to 8 page report on the topic. Feedback on the reports is provided.

The course is organized in a way that each student has at least one presentation and writes at least two reports.

Pedagogical development - I

Changes made since previous time course was given

The course structure has been completely revised from the previous course round due to a change in the course responsible.

Course evaluation; comments from students

Based on the questionnaire used at the Division.
If the course has less than 10 students, the questionnaire can be replaced by informal discussions.

Evaluation response rate*	100 %
Overall student view*	Positive but the examination part can be improved
Positive comments	<ul style="list-style-type: none"> • “You practice presenting skills and writing skills, while learning a fusion topic”. • “course literature is good” • “It was nice to read about other subject that you normally don’t encounter in your own research”. • “It is useful to obtain ideas for writing a thesis” • “I like the course design in general”
Negative comments	<ul style="list-style-type: none"> • Writing the reports is very demanding in terms of time.
Pre-knowledge, comments*	In level.
Course design, comments*	Ok, students like the course design.
Literature, comments	Ok. One comment: “ it would be a good idea to provide certain key references/papers for some of the topics. ”
Examination, comments	Perhaps too much time consuming.
Particularly interesting* comments	

Course teacher’s impressions from the evaluation

Comments	The preparation of the reports seem to be a bit too much time consuming. For the next course round I should consider to the reduce the length of the reports or to reduce their number.
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Course teacher's summary

Overall view	Course worked well. Good presentations by the students and good discussion afterwards.
Positive comments	The new course design seems to work very well.
Negative comments	The reports are perhaps a bit too much time consuming for a 8hp course.
View on pre-knowledge*	ok.
View on course design*	Worked well, no plan to change the design.
View on course material	Ok, I should consider to provide also some key papers, not only specific book chapters.
View on examination	The last reports have been handed in with large delays. This might be because the work load was too high. I will consider to reduce the number of reports.

Pedagogical development - II

Outcome of course changes made since last time course was given	The new course design worked well.
Changes to be made before next time course is given	<p>I should consider to reduce the number of reports. A possibility is to task for only one single report of 6-10 pages. Given that:</p> <ul style="list-style-type: none">▪ the learning outcomes of the course cover fusion research from a wide perspective,▪ the course is taken at the end of the PhD studies, <p>the report can be written with the idea that it will establish the basis of the "Introduction" chapter of the PhD thesis.</p>

Other

Comments*	-
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