

COURSE ANALYSIS, postgraduate course

Third cycle courses, EECS School, KTH

An asterix (*) denotes non-compulsory data.

Course data

Course name	MAGNETOHYDRODYNAMICS
Course ID	FED3230
Credits	8 hp
Time period for course	VT2021
Teachers	Jan Scheffel (jan.scheffel@ee.kth.se)
Classroom hours	4 x 2
Nr of registered students	3
Examination rate, in %	100

Goals

Global course goals	<p>When completing the course, the student should be able to</p> <ul style="list-style-type: none">• Provide the details of the derivation of ideal and resistive MHD equations• Describe and explain the domains of validity of one-fluid MHD• Demonstrate the basic properties of ideal MHD• Give detailed examples of MHD equilibria and their properties• Discuss MHD waves• Derive the Energy principle• Apply the Energy principle to the Rayleigh-Taylor instability
How the course design helps to fulfill these goals	<p>The course is given as a set of four discussion meetings. Each student is expected to have studied the corresponding sections of the course and to have prepared five questions to discuss jointly at the meetings.</p> <p>The course design stimulates the students to continual studies. Also, at the course meetings, subject understanding can be obtained in due time.</p> <p>A comprehensive set of course problems should be solved at home and defended at a brief oral examination at the end of the course.</p>

Pedagogical development - I

Changes made since previous time course was given	No major changes. The course literature is now fully available electronically through KTHB (Primo).
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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 % The questions were: 1) Was the course relevant with respect to your expectations and the course goals? 2) Was the course in level with your pre-knowledge? 3) What do you think of the course design / teaching / learning? 4) What is your opinion of the course literature? 5) What do you think of examination in the form of log book /home assignment + brief oral examination? 6) Any positive viewpoints? 7) Any negative viewpoints? 8) Would you like to change anything in the course?
Overall student view*	<ul style="list-style-type: none">• ”Ja, stämde bra överens” (expectations).
Positive comments	<ul style="list-style-type: none">• ”A very nice and compact course. The questions force to reflect after the reading on the material. Also I like the summary part of the examination.”• ”Seminar structure, several choices of literature for the same content, choice of examination problems.”
Negative comments	<ul style="list-style-type: none">• ”Even though the course was one of the best I have taken during my 7 years in university studies there was one source of frustration; to force out questions you do not have. This often led to trivial questions like “Where does this minus sign come from?” which do not generally promote discussion. I am however unsure of the best solution to this problem, if there is any.”• ”Personally, I have trouble talking freely and in adequate depth about a topic I just learned one week ago.”
Pre-knowledge, comments*	<ul style="list-style-type: none">• ”During the course I never felt I lacked any pre-requisite knowledge and felt the course contents had a good level in complexity.”
Course design, comments*	<ul style="list-style-type: none">• ”I like about the design that the course is supposed to make us think. The formulating of own questions helped to reflect on the reading. The written answer to the exam questions forces me to summarize the most important course-outcomes.”
Literature, comments	<ul style="list-style-type: none">• ”Bra litteratur, jag tycker att de olika böckerna kompletterade varandra bra.”
Examination, comments	<ul style="list-style-type: none">• ”Examinationen var bra. Bra att få tydlig feedback på inlämningarna så att man kunde rätta till det senare.”• ”I thoroughly enjoy it! I think it promotes learning and understanding (at least for me) compared to problem-solving exercises.”• ”The examination exercises that were not focused on problem solving but on understanding instead is something that was new to me and that I hope more courses would

Particularly interesting* comments	<p>adopt. It felt very good to work with exercises where you continuously learned, instead of as many times with problem solving where you can get stuck on a question for hours without actually learning anything.”</p> <ul style="list-style-type: none"> • ”Additionally, even though I enjoyed the seminars in general, at times I did not have any questions and felt forced to make up things I did not wonder about which was slightly frustrating. For the teacher to have some additional questions that can be brought up in these cases might make the seminars more beneficial.” • “I would wish for the seminar meetings to have a few focus points set by the teacher, so there is enough time to highlight and discuss on the actually important parts of the chapters, as one can easily get hung up on a question by a student.”
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Course teacher’s impressions from the evaluation

Comments	Merely positive comments. Overall I agree with the perceptions of the students.
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Course teacher’s summary

Overall view	The course worked out fine, with three very capable students.
Positive comments	Appreciated introduction of MHD using continual learning.
Negative comments	The students would like to see more teacher led parts of the discussion meetings and higher quality of the topics that are brought up by the students for discussion.
View on pre-knowledge*	Has never been a problem.
View on course design*	To base PhD courses on discussion meetings work really well in small groups (up to 10 participants).
View on course material	Fine.
View on examination	Works well, with satisfied students.

Pedagogical development - II

Outcome of course changes made since last time course was given	The course literature is now more of an organic whole. Parts of it is overlapping, but the students appreciate to have different perspectives on parts of the course.
Changes to be made before next time course is given	<ul style="list-style-type: none"> • Consider preparing brief introductions or theoretical presentations to each of the four meetings in the course. • Find ways to make the students design more adequate topics for the group discussions.

Other

Comments*	
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