

COURSE ANALYSIS, postgraduate course

Third cycle courses, EECS School, KTH, from 2018

An asterix (*) denotes non-compulsory data.

Course data

Course name	KINETIC PLASMA THEORY
Course ID	FJD3300
Credits	6 HP
Credits per module	
Time period for course	VT2019
Teachers	Jan Scheffel (jan.scheffel@ee.kth.se)
Examiner	Jan Scheffel
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">• Derive the basic plasma kinetic equation from first principles• Discuss applications and validity of the Vlasov and Boltzmann equations• Describe and explain Landau damping and the two-stream instability• Describe basic kinetic properties of hot magnetised plasmas• Derive and explain the Fokker-Planck equation• Describe basic relaxation processes and collision times• Distinguish between fully kinetic, drift kinetic, hybrid and gyrofluid models
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	This was the first time the course was given.
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Course evaluation; comments from students

Based on the anonymous questionnaire.

Evaluation response rate	100 % The questions were: 1) Was the course relevant with respect to your expectations and the course goals? 2) What do you think of the course design / teaching / learning? 3) What is your opinion of the course literature? 4) What do you think of examination in the form of log book /home assignment + oral presentation? 5) Was the course in level with your pre-knowledge? 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">• ”En nödvändig kurs med bra upplägg och som innehöll ganska bred grundläggande kunskap. Väl fungerande seminarier och relevanta hemuppgifter.”• ”The course is “Heavy” but it is great that we have discussion sessions to resolve issues.”
Positive comments	<ul style="list-style-type: none">• ”I like the design of the course with reading material and meetings with questions”.
Negative comments	<ul style="list-style-type: none">• ”Sometimes it seemed a bit unguided during meetings because the students were focused on different things.”
Pre-knowledge, comments*	<ul style="list-style-type: none">• ”Mostly (...in level...), however my knowledge of some mathematics such as the Residue theorem, and the mathematics behind the Penrose Criterion, were lacking.”
Course design, comments*	<ul style="list-style-type: none">• ”The course design and literature is great.”• ”Kursupplägget fungerar bra med allas olika scheman, och gynnar förståelse.”• ”I prefer this type of course design.”
Literature, comments	<ul style="list-style-type: none">• ”The literature was great. A bit scattered, but different books/chapters really complimented each other.”
Examination, comments	<ul style="list-style-type: none">• ”Upplägget med frågor och seminarier fungerar bra, tycker jag. Också bra med uppmuntran att leta efter övergripande bild, snarare än att snöa in på allt för specifika saker.”• ”Oral exams are good for PhDs I think”.
Particularly interesting* comments	<ul style="list-style-type: none">• ”I wish meetings/discussions could be more productive, but I don't know how exactly to achieve that.”• ”Möjligtvis att jag tycker att en del av hemuppgifterna är för vagt ställda. T.ex. "briefly sketch" eller "what is meant by". De skulle kunna vara mer specifika.”

Course teacher's impressions from the evaluation

Comments	Considering that this was the first time the course was given (there was a course on this topic a number of years
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ago, but this version is designed differently) I believe the it landed quite well.

Course teacher's summary

Overall view	Functioned well from my view. Happy students.
Positive comments	The literature was well chosen (I spent a lot of time on this) and the course design was appreciated.
Negative comments	The course meetings seems to need more guidance in order to use the time efficiently
View on pre-knowledge*	Quite OK.
View on course design*	Was appreciated and functioned well.
View on course material	Got high grades.
View on examination	Hand-in assignments + brief oral examinations works fine in PhD courses.

Pedagogical development - II

<i>Outcome of course changes made since last time course was given</i>	This was the first time the course was given.
<i>Changes to be made before next time course is given</i>	<ul style="list-style-type: none">• I will aim to give a brief introduction at each course meeting.• During the meetings I will try to encourage a more focused debate on essential topics and points of interest.

Other

Comments*