



Course analysis: MJ2515 Numerical Heat Transfer in Energy Technology, VT25

Prepared by Andrew Martin, andrewm@kth.se (course coordinator and examiner)

Changes made since previous course offering

For this offering students were encouraged to use generative AI in programming. Some adjustments were made to streamline lecturing content and to increase tutorial support. Otherwise the main content and activities were unchanged.

Compilation of course evaluation results (required)

Six of the 39 enrolled students responded to the survey (unfortunately there were difficulties in launching the questionnaire owing to change in platform, hence the low response rate). These students were overall positive towards their experience in the course. Most remarked on the relatively high workload in relation to the amount of credits.

Student feedback was also obtained during the oral examination, which involved individual 15-minute Zoom meetings. Here students also indicated a high degree of satisfaction; the high workload was also mentioned. When asked if generative AI was used the majority indicated so. A few students said that own programming efforts were preferred.

Course coordinator's reflections on what has worked well and what can be developed in the course

The course has been run with the same structure for several occasions. This arrangement appears to be conducive towards guiding students towards successfully fulfilling the learning outcomes. Wide availability of AI tools has enabled students to handle programming much more quickly. However, one concern has to do with an overdependence on generative AI. During oral examinations it was clear that a handful of students had trouble navigating through their code, implying that generative AI was employed with little or no additional effort. The teaching team will meet during the fall to discuss possible measures, for instance monitored exam instead of home-based exam.

Summary of changes to be introduced for the next course (required)

For VT26 the teaching team will be expanded to include a total of three post-doctoral researchers. This is expected to boost student performance by allowing for more in-class guidance. Home assignments will be reviewed for potential streamlining and other changes. A monitored exam will be considered in lieu of home-based exam.

Brief comment on result of examinations

30 students completed the course on time: 29 A's and 1 B. An additional 9 students completed the course by June, and additional student completed the course in August.



Course Analysis - MJ2515 Numerical Heat Transfer in Energy Technology 3 HP

Course analysis part 1

1.1 Course overview

Course name: Numerical Heat Transfer in Energy Technology
Course code: MJ2515
Course instance code: 60321
School:
Institution:
Term: VT25
Examiners: Andrew Martin
Course coordinator: Andrew Martin
Teachers:
Number of registered students: 38
Part of program: TSUEM, CENMI, TIETM, MILANO02
Examination modules: INLA, INLB, TEN1
Course goal: After passing the course, the student should be able to:

- Describe numerical methods for handling of partial differential equations and derive specific relationships for programming
- Define governing equations for relevant heat transfer processes and design representative numerical simulations
- Analyse simulation results, considering validity, precision and numerical stability

1.2 Reported examination modules and overall result of the course

1.2.1 INLA

0 students with reported result

P	F
0 (0%)	0 (0%)

1.2.2 INLB

0 students with reported result

P	F
0 (0%)	0 (0%)

1.2.3 TEN1

0 students with reported result

A	B	C	D	E	FX	F
0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

1.2.4 Course result

0 students with reported result

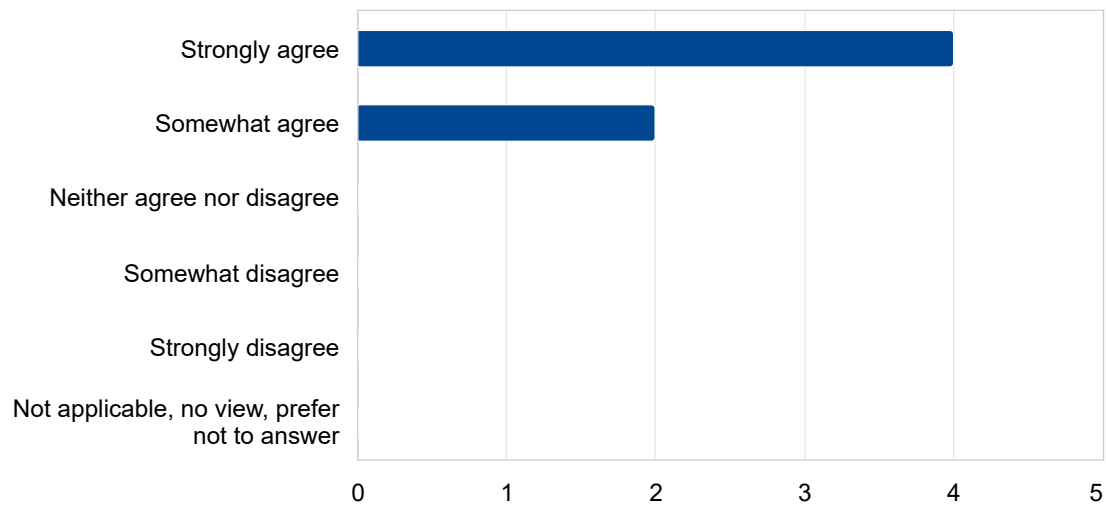
1.3 Course evaluation results

Number of Respondents: 38

Answer Count: 6

Answer Frequency: 15.79%%

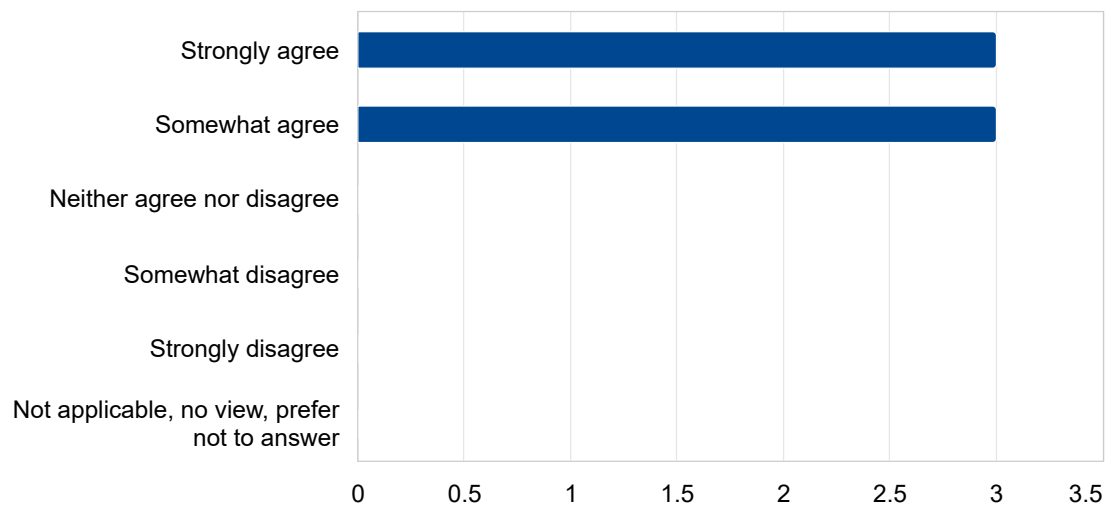
1. The course information was well organised, with clear learning objectives and expectations.



Mean	
The course information was well organised, with clear learning objectives and expectations.	4.7

The course information was well organised, with clear learning objectives and expectations.	Number of responses
Strongly agree	4 (66.7%)
Somewhat agree	2 (33.3%)
Neither agree nor disagree	0 (0.0%)
Somewhat disagree	0 (0.0%)
Strongly disagree	0 (0.0%)
Not applicable, no view, prefer not to answer	0 (0.0%)
Total	6 (100.0%)

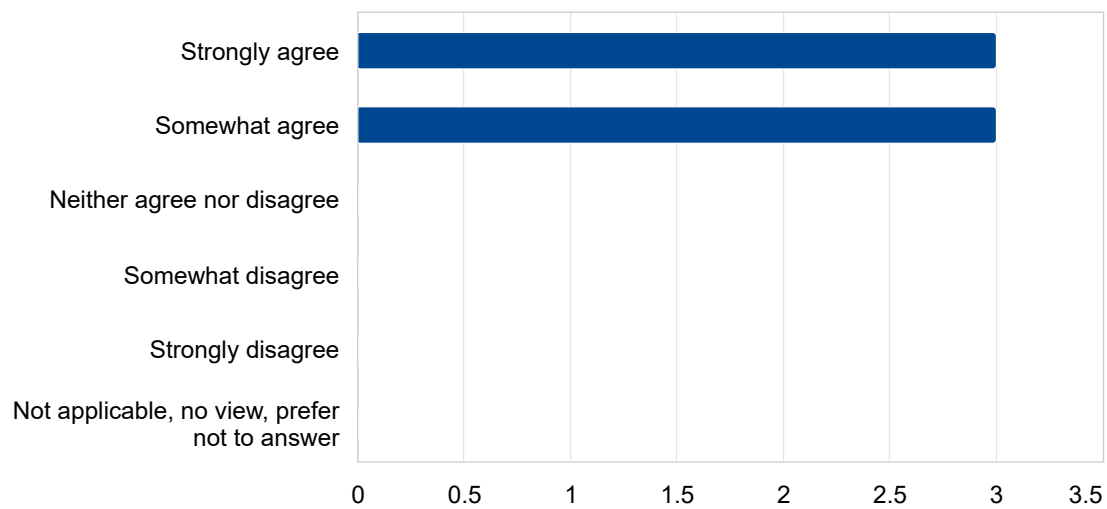
2. The course design provided good support for my learning.



Mean	
The course design provided good support for my learning.	4.5

The course design provided good support for my learning.	Number of responses
Strongly agree	3 (50.0%)
Somewhat agree	3 (50.0%)
Neither agree nor disagree	0 (0.0%)
Somewhat disagree	0 (0.0%)
Strongly disagree	0 (0.0%)
Not applicable, no view, prefer not to answer	0 (0.0%)
Total	6 (100.0%)

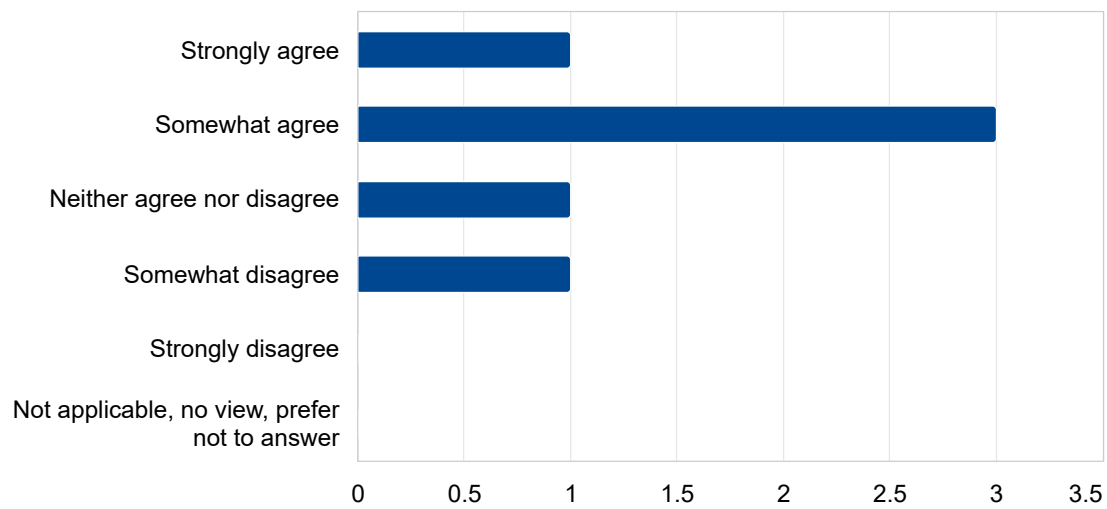
3. The course gave opportunities for monitoring my own progress and understand what I needed to do in order to succeed with the course.



Mean	
The course gave opportunities for monitoring my own progress and understand what I needed to do in order to succeed with the course.	4.5

The course gave opportunities for monitoring my own progress and understand what I needed to do in order to succeed with the course.	Number of responses
Strongly agree	3 (50.0%)
Somewhat agree	3 (50.0%)
Neither agree nor disagree	0 (0.0%)
Somewhat disagree	0 (0.0%)
Strongly disagree	0 (0.0%)
Not applicable, no view, prefer not to answer	0 (0.0%)
Total	6 (100.0%)

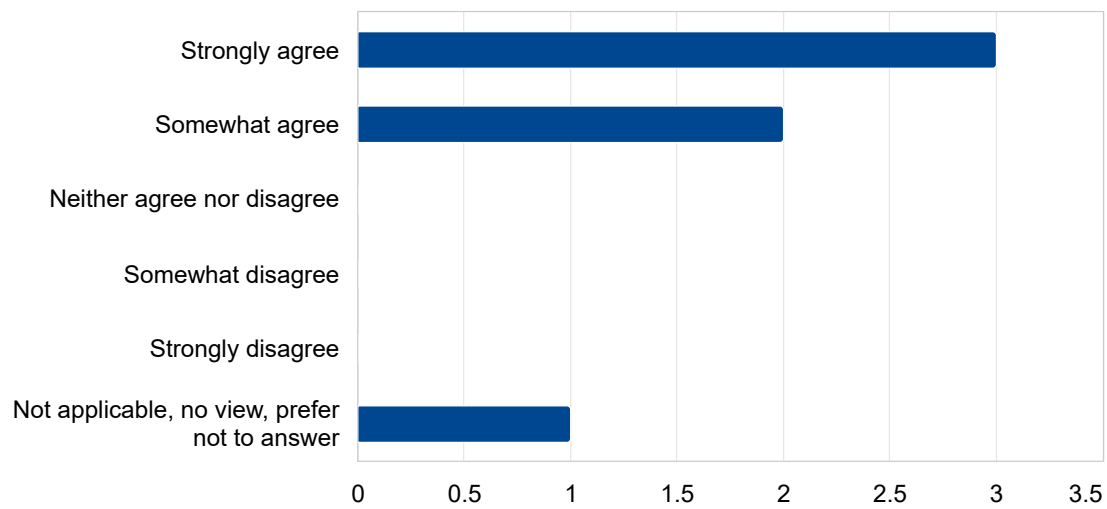
4. I participated actively in the different parts of the course and studied continuously.



Mean	
I participated actively in the different parts of the course and studied continuously.	3.7

I participated actively in the different parts of the course and studied continuously.	Number of responses
Strongly agree	1 (16.7%)
Somewhat agree	3 (50.0%)
Neither agree nor disagree	1 (16.7%)
Somewhat disagree	1 (16.7%)
Strongly disagree	0 (0.0%)
Not applicable, no view, prefer not to answer	0 (0.0%)
Total	6 (100.0%)

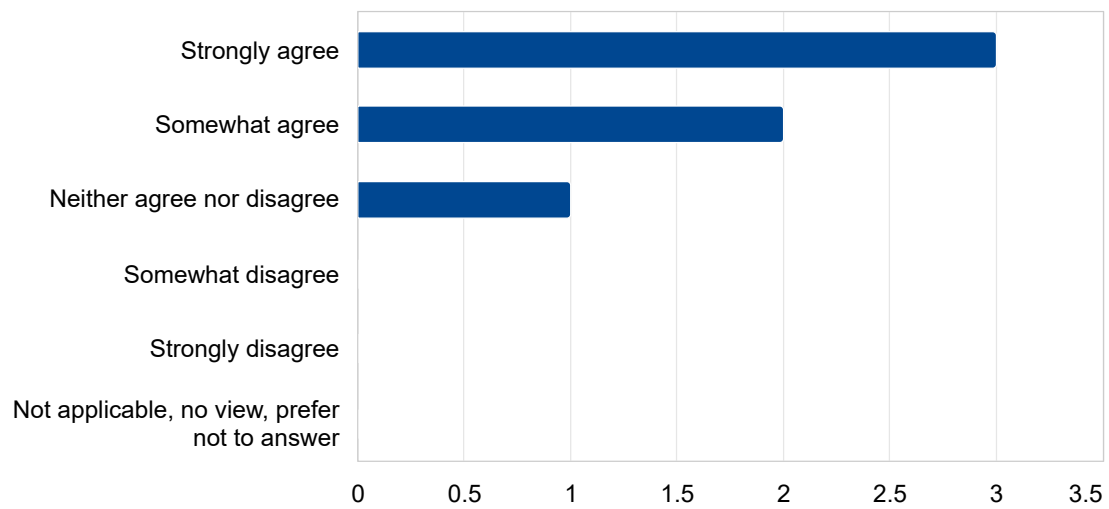
5. I felt included and respected in this class.



Mean	
I felt included and respected in this class.	4.6

I felt included and respected in this class.	Number of responses
Strongly agree	3 (50.0%)
Somewhat agree	2 (33.3%)
Neither agree nor disagree	0 (0.0%)
Somewhat disagree	0 (0.0%)
Strongly disagree	0 (0.0%)
Not applicable, no view, prefer not to answer	1 (16.7%)
Total	6 (100.0%)

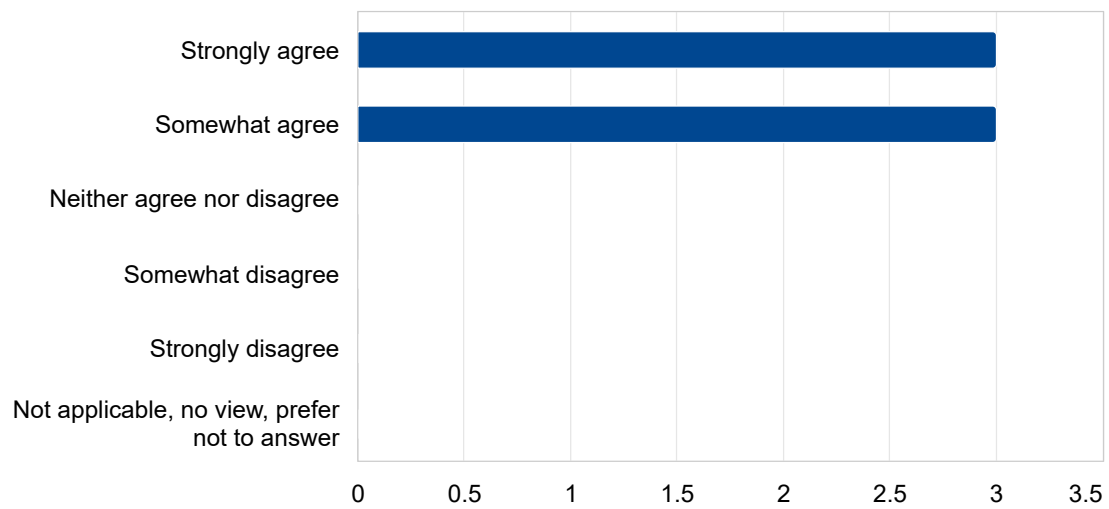
6. The course had reasonable scope and workload.



Mean	
The course had reasonable scope and workload.	4.3

The course had reasonable scope and workload.	Number of responses
Strongly agree	3 (50.0%)
Somewhat agree	2 (33.3%)
Neither agree nor disagree	1 (16.7%)
Somewhat disagree	0 (0.0%)
Strongly disagree	0 (0.0%)
Not applicable, no view, prefer not to answer	0 (0.0%)
Total	6 (100.0%)

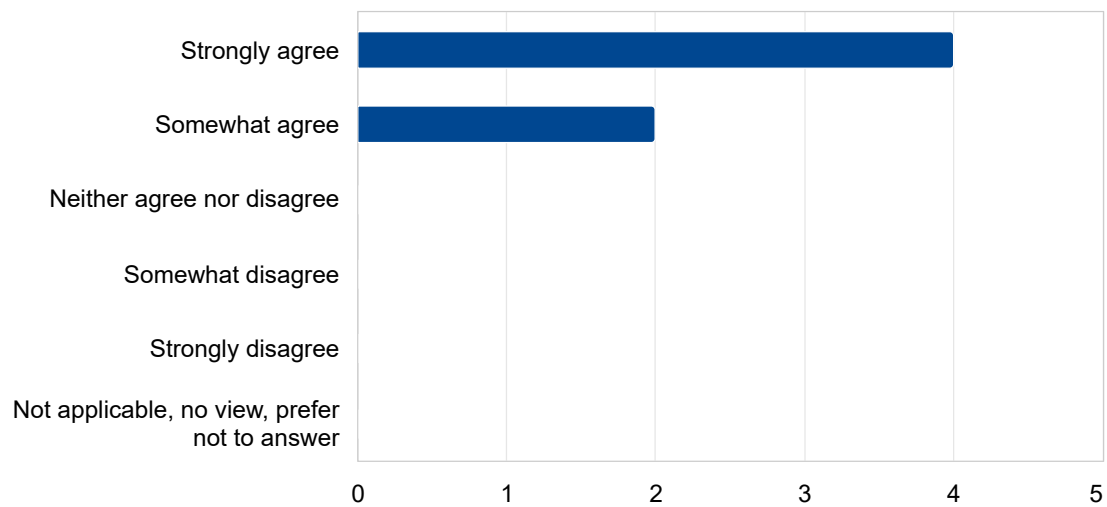
7. The assessment was meaningful.



Mean	
The assessment was meaningful.	4.5

The assessment was meaningful.	Number of responses
Strongly agree	3 (50.0%)
Somewhat agree	3 (50.0%)
Neither agree nor disagree	0 (0.0%)
Somewhat disagree	0 (0.0%)
Strongly disagree	0 (0.0%)
Not applicable, no view, prefer not to answer	0 (0.0%)
Total	6 (100.0%)

8. The course feels relevant and I have developed my competence.



Mean	
The course feels relevant and I have developed my competence.	4.7

The course feels relevant and I have developed my competence.	Number of responses
Strongly agree	4 (66.7%)
Somewhat agree	2 (33.3%)
Neither agree nor disagree	0 (0.0%)
Somewhat disagree	0 (0.0%)
Strongly disagree	0 (0.0%)
Not applicable, no view, prefer not to answer	0 (0.0%)
Total	6 (100.0%)

9. What has worked well in the course?

What has worked well in the course?

Now we have a language to interpret real numerical apps.

It was nice that all the lectures were recorded. It was also quite nice with personal feedback on the assignments, even though it would have been nice to have the second assignment corrected before the exam.

10. What can be developed in the course?

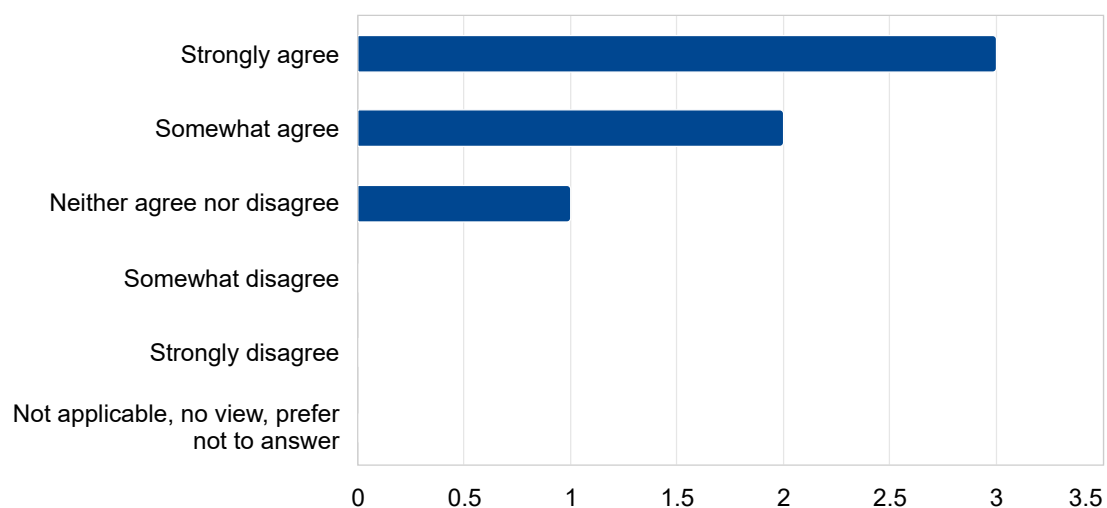
What can be developed in the course?

the course could further develop into the CFD modelling or numerical modelling as this is what is used during work

It was quite a lot of workload to be a 3 credit course.

Though a case example of how this can be made more complicated in a real app may be informative.

11. My overall impression of the course regarding both implementation and content is that it is good.



Mean

My overall impression of the course regarding both implementation and content is that it is good.

4.3

My overall impression of the course regarding both implementation and content is that it is good.		Number of responses
Strongly agree		3 (50.0%)
Somewhat agree		2 (33.3%)
Neither agree nor disagree		1 (16.7%)
Somewhat disagree		0 (0.0%)
Strongly disagree		0 (0.0%)
Not applicable, no view, prefer not to answer		0 (0.0%)
Total		6 (100.0%)