KTH Industrial Engineering and Management

Report – MJ2381 20-10-23

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Respondents: 22

Answer Count: 7

Answer Frequency: 31.82 %

COURSE DESIGN

Briefly describe the course design (learning activities, examinations) and any changes that have been implemented since the last course offering.

Viktoria Martin was course examiner, Francesco Gardumi course responsible and several teachers delivered part of the teaching and supported the assessment: Vignesh Sridharan, Youssef Almulla, Agnese Beltramo, Ioannis Pappis and Will Usher. The course responsible took overall responsibility for organisation of the course, communication with students and assessments and delivered lectures and labs to a great extent. The course examiner took charge of the final grading.

The course is organised in 5 lectures and 6 computer labs. The lectures are intended to provide key concepts for the lab activities and the labs deal with both individual and group tasks that are delivered as assignment and graded. The final grade is a weighted average of the grades from the assignments, with modality extensively described on Canvas and during the first lecture.

The Intended Learning Outcomes of the course had been changed few months before the start, to better reflect the overall objective. This would be to understand and develop critical thinking upon the discipline of long-term energy systems analysis and planning and the use of energy system modelling tools. The course responsible strived to communicate to the students that critical thinking and analytical mindset were the most important outcome. He also kept remarking, at the end of each class, that feedback by the students was essential to improve the course's quality. In this view, besides the Course evaluation, he published on Canvas a short survey after each lecture: this included one quiz question ('How do you evaluate today's lecture on a scale from 1 (lowest) to 5 (highest)?'; and one open question ('Kindly motivate your answer and provide suggestions for improvement, if any').

THE STUDENT'S WORKLOAD

Does the students' workload correspond to the expected level (40 hours/1.5 credits)? If there is a significant deviation from the expected, what can be the reason?

The students reporting highest workload reported a maximum 11 hours/week, which means 88 hours over the entire course duration. This is almost half of the 160 hours that would be required of the 6 credits. The load seems to be a bit low and this was also highlighted by some of the comments in the course evaluation. Balancing the load is challenging, since the course is given jointly with MJ2380, where students struggle significantly more with the workload. Ways this could be addressed are discussed below.

THE STUDENTS' RESULTS

How well have the students succeeded on the course? If there are significant differences compared to previous course offerings, what can be the reason?

All registered students attended the course and passed it, with very high grades (between A and B) and showing full achievement of the ILOs and deep learning.

OVERALL IMPRESSION OF THE LEARNING ENVIRONMENT

What is your overall impression of the learning environment in the polar diagrams, for example in terms of the students' experience of meaningfulness, comprehensibility and manageability? If there are significant differences between different groups of students, what can be the reason?

Student's satisfaction was very high and expressed with significant response rate in the course evaluation questionnaire. No difference in learning environment between groups of students was reported by any student.

ANALYSIS OF THE LEARNING ENVIRONMENT

Can you identify some stronger or weaker areas of the learning environment in the polar diagram - or in the response to each statement - respectively? Do they have an explanation?

The response rate of students to the requests for feedback was higher than in previous years (>30%). This is considered a great achievement. It could be due to the fact that this year we took measures to show the students that their feedback is really taken into account. We showed during the first lecture the outcomes of the previous year's course evaluation and the measure we took to address the students' comments.

The students' evaluations show satisfaction with the course, especially with the passion and involvement of the teachers and with their availability for tutoring and explanation.

This feedback is very well received as it will help the course responsible identify the elements that should be kept for future editions.

Remarks were made by some students from the twin course MJ2380, held together with this one. It can be then inferred that such remarks would be mostly related to the additional tasks and workload requested in MJ2380 (9 credit course) and the way these are carried out. Actions will be taken to address those comments and they will also imply changes in the structure of MJ2381. However, the course responsible deems those changes positive and not affecting previously designed activities.

ANSWERS TO OPEN QUESTIONS

What emerges in the students' answers to the open questions? Is there any good advice to future course participants that you want to pass on?

Students definitely provided important feedback for the future development of the course. This responded to a constant and repetitive call for feedback that the course responsible made during the teaching sessions and is highly appreciated.

PRIORITY COURSE DEVELOPMENT

What aspects of the course should primarily be developed? How could these aspects be developed in the short or long term?

The course undergoes regular updates, taking into account the teaching and learning experiences from within the course and beyond. From reflections in previous editions, the course structure and content were significantly modified to improve the constructive alignment between objectives, contents, activities and assessment.

This year, the changes implemented in the course structure and content responded mostly to remarks by students in the twin course MJ2380. However, they are deemed to affect only positively (or at the worst be neutral towards) the learning environment in MJ2381. The following major aspects have been changed (among several others):

- We have moved away from a piece of software that was causing problems among the students, hindering their learning process and significantly increasing their load in the wrong direction (especially in MJ2380). The new software should ensure smoother learning and more focus on the core aspects of the course (understanding of the dynamics occurring in an energy system model). However, it must be highlighted that the objective of this course is looking 'under the hood' of energy modelling. As such, it will not use ready-made interfaces and it will be by default confusing to a certain degree. This will be better communicated to the students.
- Specific pre-requisites for the course have been added to the course website and course memo, to make students aware of the knowledge needed to excel in the course. These are needed to be able to keep up with the course activities without struggling and to obtain the highest outcomes. Material will be suggested to make up for the needed knowledge, for students who do not entirely possess the pre-requisites. These pre-requisites are expected to affect students in MJ2380 but not students in MJ2381. The latter have shown sufficient and strong background in linear algebra.
- A more extensive description of the course, its objectives, its contents and the grading criteria has been published upfront in a course memo, to better inform the students' expectations. There, the link to sustainable development issues has also been clarified, to the extent allowed.
- An occasion for ungraded feedback has been introduced at the start of the course, to guide students toward how they should write their assignments and reflects during the rest of the course.
- More attention will be given to ensuring that all the theoretical background is available to the students and that they are aware of it. The assessment will have higher emphasis on individual critical reflection, based on literature and own experience. This will make the course more positively challenging for students in MJ2381, increase the need for creating a theoretical background and rebalance practical experience with theoretical knowledge.
- Debugging, i.e. struggling with modelling issues, software issues, installation issues, lack of proper inputs, lack of results, etc., was introduced as an official learning occasion (Lab 2). This is meant to make the students understand that debugging is a part of modelling, always present in the modelling process, key to model and software development. Skills related to

model debug are going to be an outcome of this course and they are highly valued in the work environment.

OTHER INFORMATION

Is there anything else you would like to add?

I reflected on a few aspects beyond those raised by the students. The first one is the lack of references to sustainable development in the course description, objectives and intended learning outcomes. This does not correspond to reality, since the course content has high focus on sustainable development challenges related to energy, land use, water use and climate action. Correcting this requires time, since the course syllabus (including the learning outcomes) needs to be changed. The changes will be fully implemented by 2022-2023. However, some minor changes have already been implemented, to the benefit of students of the edition 2021-2022.

Also the taxonomy of the ILOs needs to be updated, to better reflect the skills and competences that the students acquire (and are expected to acquire) with this course. This would also address some – sporadic – comments by students that somehow highlighted a mis-alignment between course content and learning objectives.