

# Report - AL2115 - 2022-05-19

Respondents: 1  
Answer Count: 1  
Answer Frequency: 100.00%

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Please note that there is only one respondent to this form: the person that performs the course analysis.

**Course analysis carried out by (name, e-mail):**

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**DESCRIPTION OF THE COURSE EVALUATION PROCESS**

**Describe the course evaluation process. Describe how all students have been given the possibility to give their opinions on the course. Describe how aspects regarding gender, and disabled students are investigated.**

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The course evaluation process had several components. In addition to the standard KTH learning experience questionnaire (LEQ), the teachers used two on-line questionnaires (at the start and at the end of the course, respectively) to collect information about students' expectations, learnings and experiences from the course. About halfway through the course, the teacher team had a meeting with four student representatives (coming from two different master programmes; 2 male and 2 female students volunteered to be in the group). The representatives have collected input from their peers prior to the meeting and shared with the teachers not only their own thoughts but of those who provided the input. The course in itself is collaborative, meaning it is taught in constant dialogue with the students through different feedback loops. Thus, the teachers encouraged the students to leave their feedback in relation to each seminar on the digital collaboration platform used by the course (Miro). Also, during the interim presentations, the teachers invited students to leave anonymous comments on digital post-it notes with feedback regarding the course content, pace, learning environment, etc. The LEQ was answered by female students only, but the on-line questionnaires and the student feedback group were answered and attended by students of all genders. In addition to the evaluation by the students, opinions of societal partners of the course are also regarded as a form of course evaluation. Stakeholders representatives (this year, Skellefteå municipality) were actively involved in the course throughout the process - from the introduction to the project work to the final presentations where they had an opportunity to give feedback regarding the outcomes achieved during the course to both students and teachers. Furthermore, after the course ended the final reports were published on the municipality webpage and two groups were invited to present their project results to stakeholders from the city, which indicate their overall satisfaction with and relevance of the course outcomes to the municipality.

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**DESCRIPTION OF MEETINGS WITH STUDENTS**

**Describe which meetings that has been arranged with students during the course and after its completion. (The outcomes of these meetings should be reported under 7, below.)**

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The first meeting with the course representatives (4 student representatives, 2 male, 2 female; from different master programmes) was organized halfway through the course, in the digital format on Zoom. The course representatives came well prepared for the meeting - they collected input from the classmates using an online survey and identified key or reoccurring issues to raise during the discussion. The meeting was primarily students-led with follow-up questions being asked by teachers (2 teachers, both female). Overall, the meeting was mainly focused on the first half of the course and particularly on the design and pace of the seminars, introduction to the project work, and the interactions with stakeholders in the form of Q&A sessions and Interim presentations. Student representatives expressed the wish to have at least one seminar on campus (otherwise, the course was conducted digitally due to the Covid-19 recommendations that were lifted midway into the course). This led to the joint decision to arrange the coaching session seminar at the end of the course on campus which was appreciated by both students and teachers.

Another meeting with course representatives happened after the course ended and grading was reported. It was focused on the retrospective process analysis of the course. The meeting was attended by three students (2 male, 1 female; coming from two different master programs) and two teachers (both female). The meeting was organised after KTH lifted Covid-19 restrictions which meant that we could meet on campus which enabled a very engaging and insightful discussion. The meeting provided a lot of useful insights for the future editions of the course and raised a challenge of how digital tools can still be used when education is conducted on campus again.

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## **COURSE DESIGN**

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

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The course aims at providing students with insights about processes of transitions in complex systems and equip them with approaches for system design and steering transition for sustainability. In terms of the structure, the course includes five lectures, nine seminars and four special activities (i.e. Introduction into the project work, Interim critique/Interim presentations, Coaching session and Final presentations). Additionally, in this year edition, two Q&A sessions with societal stakeholders were organised. The course is mandatory for the students taking the "Energy for Smart Cities" Master's Programme and conditionally elective for students taking the "Sustainable Technology" Master's Programme. It is usually also taken by a handful of exchange students.

In its theoretical part (five lectures), the course covers elements of theory from Transition Studies, Future Studies, Complex Systems and Transdisciplinarity. One of the lectures provides an overview of the modular Participatory backcasting (mPB) framework. The lectures thereby provide background and context to the project work (3,5 er, A-F), which is the largest part of the course. The project work consists of the design and implementation of a mPB project, addressing a real-life complex transition challenge, this year focusing on the sustainable future (by 2050) of Skellefteå municipality. The project work this year was carried out in groups of three to five students who work together to generate a vision and pathway for a more sustainable future for societal functions of their choice (e.g. mobility, housing, education, future of jobs).

The seminars are set up to guide the students through the modular participatory backcasting (mPB) process, introducing each module in several exploratory exercises. The exercises are intentionally designed to first provide students with an opportunity to try new methods by themselves and later connect developed insights to relevant theory in the concluding part of each seminar. The seminars were developed in a way to enable active and collaborative learning of students in the digital learning environment (using Zoom and Miro as a platform for collaboration). In addition, each project group could ask teachers to join them in breakout rooms to answer group-specific questions.

Special events of the course included Introduction into the project work, Interim critique, Coaching session and Final presentations. This year, Introduction into the project work was conducted digitally and included the team building and project management exercises and presentations of representatives of Skellefteå municipality who provided students with initial materials and data, as well as shared their perspectives on the trends and ongoing developments in the city that are very active due to the establishment there of a Northvolt battery factory.

During the Interim critique/Interim presentations (halfway through the course) the students presented their work, with an emphasis on the work process and interim outcomes. The students receive feedback from teachers and peers both in form of a dialogue and through digital post-it notes. The coaching session is a longer seminar designed to help students in preparation for the Final presentations and writing of the final reports. This year it was the only seminar conducted on campus (all other activities were run digitally). With this, it was used as an opportunity for peer learning and interaction between different project groups. It also included opportunities for socialising and networking during the coffee breaks organised which were otherwise lacking in the course due to the pandemic-related restrictions.

During the Final presentations the students presented the main outcomes of their project work. Special focus was given to the communication with the use of creative presentation methods, all created and presented digitally (e.g. short movies, role plays, interactive posters). The Final presentations were attended by teachers and representatives of the societal partners (Skellefteå municipality). Similarly to the Interim critique, each group received feedback in a form of discussions and through digital post-its. Each group's results were also compiled into a study report and the students conducted individual reflections about the work process and what they had learned.

The two home assignments (HA1: 1,5 cr & HA2:1,0 cr) aim to give the students an opportunity to familiarise and work individually with the key concepts presented in the course, in a way that is also meaningful in relation to the project work. The lectures and seminars count towards attendance (1,5 cr). The design of both HA1 and HA2 was the same as the year before with the only difference in the topic which was also aligned with one of the project work.

The course literature consists of the online manual (<http://mpb.urbant.org/>) and scientific papers provided via Canvas. The students are also encouraged to seek out supplementary material and data specifically related to a focus and context of their project work.

The main change from the pre-pandemic years was the digital design of the course. This means that lectures were held on Zoom and the seminars were facilitated with the help of Zoom and Miro - a digital collaborations platform. The teachers intentionally worked to design facilitation approaches for collaborative and active learning in digital environments (for example, such techniques as the "emotions wheel" and spaces for reflexivity were developed and introduced). The teachers created frames on the shared Miro space for each seminar and encouraged students to use the platform to jointly document key learnings from each activity. Miro was also used by the project groups independently. However, unlike in 2021, the course included some in-person activities. This encompasses the meetings of some of the project groups in-person to join the seminars from a single place. This resulted in some interesting (and unexpected by teachers) dynamics which can be characterized as a hybrid rather than fully digital participation. The Coaching session seminar was organised on campus at the request of students.

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## **THE STUDENTS' WORKLOAD**

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

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The course is 7,5 credits in total, taught during one study period (P3). The students' workload should thus be about 22 hours/week. Every week there were at least 4 hours of scheduled time (seminars and lectures). The students who filed in LEQ indicate that they spent between 12 and 32 hours per week, but the majority on average spent around the recommended 22 h. During the course representatives' meeting, the students highlighted the challenges to coordinate schedules to meet as a project group. They also suggested the workload in the course is perceived as rather high by the students and suggested considering either increasing the credits for the course to 15 cr or making it last over two periods (P3+P4). At the same time, the students also expressed the workload was connected to many opportunities for learning and immersion that many students enjoyed and found fruitful for their learning outcomes.

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## **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?**

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Overall, the students succeeded well with the majority obtaining marks in the range between A and C. Both home assignments were completed by all the students, though not always from the first try. As for the project work, all project groups achieved rather high results in addressing the given sustainability transition challenge - the design of the future vision (by 2050) and transition pathway for sustainable Skellefteå municipality. While the task is rather complex and requires a holistic perspective and creativity, the students managed well and successfully integrated knowledge and backgrounds of different group members as well as of societal stakeholders they have met during Q&A sessions and engaged with through different ways (e.g. some groups made a survey, reached out to citizens on social media, interviewed local stakeholders or KTH students who might choose to move to the city in the future). The students also highlighted the benefits for learning of collaborative approaches in digital environment, including Miro platform and specific facilitation techniques introduced during the seminars (e.g. "emotions wheel" or proposed brainstorming techniques was used by groups when they met independently). Representatives of Skellefteå municipality positively commented on the results presented by the students, and shared with the teachers the following feedback after the course needed: "The input and ideas that we got from the students in AL2115 during spring of 2022 has been really inspiring and fruitful to our work towards a more sustainable Skellefteå. We have gotten valuable support from dedicated and engaged students regarding the challenges we now face in Skellefteå. Having the exchange with students add a dimension to our work, as it is often eye opening to new ideas that we in the municipality had not considered. The students have suggested several interesting solutions that we did not consider prior to this course. The modular participatory backcasting framework methods the students used to develop scenarios and solutions for Skellefteå is something that we might continue working with thanks to its proven usefulness."

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## **STUDENTS' ANSWERS TO OPEN QUESTIONS**

### **What does students say in response to the open questions?**

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Many of the answers indicate that the students are rather satisfied with the course. The most common feedback from students were that they greatly appreciate the use of a real-life case in the course (transition challenge of Skellefteå municipality), as well as the opportunity to collaborate and gather input from actual stakeholders, with one student expressing that this can be valuable for future work opportunities. Several students also appreciate the methodology and tools taught within the course (mPB, transition studies), as well as the opportunity to use systems thinking in practice. The close collaboration within the student groups and the engaged teachers are also appreciated.

Some students highlight that working with systems transformation is a complex process. Some would prefer a transition challenge for the project work to be more narrowly defined at the beginning of the course, suggesting this might alleviate some of the anxiety the initial vagueness of the project caused. However, the ability to deal with wicked and poorly defined challenges is important learning outcome as envisioned by the course.

Some students took issue with the pace of the lectures and seminars, saying that there were not sufficient time to understand the content in a way that was beneficial to the projects work. The students presented some potential suggestions as to how this could be addressed; with some students wishing for the course to be extended over two periods; and some suggesting that the report should be divided into separate deliverables. In addition, one suggestion was to cap the number of students in the course so that teachers have more time to provide feedback to students. There was also a suggestion to make the course non-mandatory, as it would ensure that all students are motivated to the same degree.

The students advice to potential future students is to 'trust the process' and to adjust their expectations as to how much time the course demands. They also advise that you should focus on collaboration and not as much on individual work; as well as to properly engage with theory and to use the digital tools recommended.

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## **SUMMARY OF STUDENTS' OPINIONS**

### **Summarize the outcome of the questionnaire, as well as opinions emerging at meetings with students.**

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The answers to the open questions, given above, reflect the overall impression of the course well. Most students appreciate the interactive and, to them, novel way of working, but describes that it can be challenging to know what to do and how - but also see that it is unavoidable with such issues when working with complex systems and therefore appreciate getting to practice. The need and opportunity to think outside-the-box and apply creativity required by the project work were both challenging and appreciated by the students. They highlighted the shift from immediate solutions to long-term thinking through the development of a vision and the focus on challenges rather than jumping to solutions among key learnings achieved.

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## **OVERALL IMPRESSION**

### **Summarize the teachers' overall impressions of the course offering in relation to students' results and their evaluation of the course, as well as in relation to the changes implemented since last course offering.**

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The teachers' are very content with this year's course offering. The quality of the students' results was generally high, and the collaboration with societal partners went particularly well this time due to their high level of engagement and interest in the course process and outcomes.

The exercises during the (digital) seminars activated students on different levels (individual - group - class) which seemed beneficial for learning. Despite the challenges of digital collaborations, the course succeeded in enabling high degree of collaborative learning and managed to achieve its learning outcomes not worse than during physical editions of the course. The online mPB manual proved useful as in the previous editions of the course, though it would benefit from an update in the part related to the examples. The emerging hybrid formats (such as when students meet physically as a group to join a digital seminar together) created new dynamics and pushed teachers to adapt on their approaches on the way.

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## **ANALYSIS**

**Is it possible to identify stronger and weaker areas in the learning environment based on the information you have gathered during the evaluation and analysis process? What can the reason for these be? Are there significant difference in experience between:**

- students identifying as female and male?
- international and national students?
- students with or without disabilities?

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From the analysis of the learning environment, it follows that the strongest aspect were connected to the ability to work with interesting issues, opportunity to collaborate and discuss with others, perceived manageability of the course based on previous knowledge as well as the fair and honest assessment during the course. Regarding the manageability, based on other feedback sources, we however see that students experiences differ with some finding it more challenging to build upon their previous knowledge.

The weaker areas (still graded rather high) are related to the ability to get support from teachers during the course when needed. This might be understandable considering the bigger than usual number of students who attended the course this year (51 while in the previous years it was around 40), changes in the teacher team (two teachers instead of three available for supervision, and a new team member). On hand digital format of the course partially decrease the intensity of interactions, but on the other hand it open for alternative channels for communication (e.g. feedback and questions on Miro, asynchronous way of interactions, joining breakout groups on request).

Since the LEQ was filled in only by female students, we can not discuss differences in experience between students of different genders. Overall, the course was well-balanced in terms of male and female students who attended it.

This year, the course is rather well balanced in terms of national and international students. In terms of the evaluation of the learning environment only international master students filled in LEQ questionnaire. We therefore can not draw any conclusions regarding differences in their experiences from LEQ questionnaires.

Based on other forms of evaluation and feedback, no major differences between different groups were noticed. However, international students reported that it was challenging for them to develop a deep understanding of the context (in Skellefteå municipality) without the support from their peers with knowledge of Swedish language and culture. The project groups were intentionally created in a way to ensure that national and international students are well-balanced in each group.

No students reported disabilities this year.

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## **PRIORITIZED COURSE DEVELOPMENT**

**What aspects of the course should be developed primarily? How can these aspects be developed in short and long term?**

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Based on the feedback received this year, several areas to consider for further development of the course emerged: scheduling and pace of the course; possible hybrid format of the course in the future; possibilities for interactions for teachers and stakeholders.

As for the first, the pace of the course is perceived as rather high and the workload seem unexpected and therefore difficult to manage for some students. This can be addressed by better communicating to students what to expect from this course so they can adjust their expectation early in the process. In the long run, the course design might be revised in different ways - from shrinking it along with the learning outcomes to be achieved to extending it to run over two study periods (extending from 7.5 cr to 15 cr) and even further advancing ILOs. The choice would depend on different factors, including the overall strategy in the master programmes it belongs to. With regard to the scheduling, in the short-term the communication between teachers in the master programme can be improved so they can better align deadlines across courses run in parallel.

With regard to the possible hybrid format in the future, we see that the development made within the course can allow for running it well both in digital and physical formats. However, this year students highly appreciated the in-person activities within the course and suggested it would be beneficial if the course is run on campus. As teachers, we see certain digital tools would still be beneficial to keep in the course. For example, Miro provides a great opportunity for process documentation and asynchronous communication during the course. It will therefore be needed to consider pros and cons of different formats for different activities and the course overall. With this, we envision challenges with a hybrid format in a sense that activities will be simultaneously accessible on campus and online since this might create issues with collaboration in and across project groups. This can be done to different extent in the short and long-term.

Finally, the challenge with limited possibilities for interactions for teachers and stakeholders need to be prioritised in the course development in the short-term. This can be addressed through either increased number of teachers, or setting a cap on the number of students (not more than 40). In the long-term, more radical strategies for the course redesign along with the substantial changes in its ILOs can be considered.

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## **OTHER INFORMATION**

**Is there anything else you would like to add?**

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The students recommend future participants to be open-minded, trust the process, take notes, stay organised and enjoy the ride.

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