

# Semester Documentation

## Semester 1 – Class of 2021

EduCo of 2021

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## Introduction

The EduCo Semester 1 Documentation for Class of 2021 includes evaluations of the domain courses, semester project, modelling week, and the semester as a whole. The information presented in this document was collected through two semester one feedback sessions—hosted by EduCo 2021—one semester survey sent out after the completion of the semester, and a survey specifically on the domain course Linear Algebra.

Each evaluation section has a similar structure. First there is a summary of the topic. Then there is an overall perception of the section, which has been derived from the feedback sessions. This is followed by the semester survey figures, which have resulted from students rating statements pertaining to the semester; the statements are rated on a scale of one to five, where 1 represents “never” and 5 represents “always”. Furthermore there are other remarks from the survey, suggestions by EduCo regarding how ATLAS staff should proceed, and agreements with the relevant staff members regarding how to proceed.

## Domain of Mathematics

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Semester; Year; Class: Semester one; 2018/2019; class of 2021

Teachers: Martin Streng, Yorick Birkholzer, and Alice Petry (TA)

### Calculus

#### *Summary of the course – calculus*

In this 4 EC course you will develop your conceptual understanding of the calculus of functions of one variable, as well as your ability to apply the concepts to solve concrete problems. You will increase your computational skills, and practice in communicating your results by means of written documentation. You will get an elementary introduction in the use of mathematical software as a tool to support the use of calculus.

The course will cover the concepts of limits, derivatives, integrals and ordinary differential equations. The challenge of this course is that all of you have a different background, both concerning topics and with respect to skill level, while we want to bring every student on a certain minimum level at the end of the course. So, we will start smoothly, while not boring those who already covered part of the material. This means that some of you might have to work harder to catch up, while others might want to do more challenging exercises.

#### *Overall perception of the course*

The class liked the system in which calculus was given, using working sessions and lectures. The mandatory exercises were doable and problems plus were nice for those who wanted to show they were capable of more.

#### *EduCo semester survey figures*

$N = 18$ , scale: 1 (never) – 5 (always)

EduCo Criterion	Mean	SD
1. This course sufficiently conveyed both theoretical and applied knowledge.	3,89	0,66
2. This course featured both group and individual work.	3,50	1,01
3. During this course, students were provided with a sufficient level of guidance.	3,78	0,71

4. For this course, there was a variety of possibilities to prove your competence.	3,94	0,85
5. This course facilitated personalization.	3,17	1,04
6. This course related to the semester project and other courses.	2,78	0,97
7. The course material was useful and relevant.	3,89	0,77
8. This course allowed for an even distribution of the workload over time.	4,72	0,45
9. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear.	4,28	0,99
10. Feedback given by the teacher was complete, useful and timely.	4,11	0,81
11. The teacher was sufficiently available for questions/feedback about the course.	4,11	0,66
12. The teacher seriously took students' feedback about the course into consideration.	4,50	0,76
13. Sufficient knowledge input and support was given to reach the learning goals set for this course.	4,11	0,57
14. The teacher taught the course in an engaging and effective way.	3,33	0,77
15. The format of the course was engaging and conducive to learning the course material.	3,67	0,75

#### *Other remarks from the survey*

People were happy that Martin asked for feedback in the beginning of the course and changed the set-up with that. One person mentioned the lectures weren't super interesting, but noted there was no real different way to do them either.

#### *Suggestions from EduCo*

Our small list of suggestions includes having a clear point to go to for those who cannot keep up in class. Secondly, it would be preferred if the teacher would stay in the room for a couple of minutes at the end of the lectures, to make it possible to ask small personal questions. An additional idea was to get the challenges from last year (class of 2020) back. Lastly, we requested to think about the amount of deadlines, since it felt a bit like high-school.

### *Agreements with Martin Streng*

Overall, Martin agreed with the feedback and noted to be interested to see what would happen in the second semester. He mentioned the applied project was cancelled due to him being sick and conflicting, busy schedules at later points in time. He agreed to take our points with him for next semester and next year.

## Linear Algebra

### *Summary of the course - Linear Algebra*

In this 2 EC course, you will develop your conceptual understanding of vectors and matrices, as well as your ability to apply these concepts to solve concrete problems in linear algebra. You will increase your computational skills, and practice in communicating your results individually by means of written documentation and as a group by giving a presentation. You will get an elementary introduction in the use of mathematical software as a tool to effectively solve systems of linear equations, perform matrix operations, and visualize outcomes graphically.

### *Overall perception of the course*

While students learned a lot and got pushed to work well, there were some complaints about the feedback. This was perceived as late, vague, inconsistent, separate from the rubric and sometimes even biased. The sessions were seen as too long and not useful enough, since students missed getting lectures and explanation about the concepts. By a significant group, the way the course was presented was perceived negatively. It was however very clear people liked the content and felt it was useful.

The course was officially 2 EC, which was less than it should be according to most of the class. This opinion was based on the workload, which was seen as a bit too high. The workload can be divided in homework, the midterm and the final presentation:

- The homework exercises were decent, although there were (due to an error) too many in the first two weeks. They did take a lot of time, which was not very comparable with other courses. One pretty general idea, for example, was that students had spent much more time on the 2 EC linear algebra course than on the 3 EC calculus course.
- However, the Midterm assignment was seen by most students as too difficult to do alone. The peer review system was liked, because everyone got a chance to compare their own assignments with the ones of their peer. This was seen as an extra learning moment, and the rubric they received was useful for the SERs. For the assessment/ check-up from the teacher, there was a lot of confusion and unease, both because not everyone received the same amount of comments about their peer feedback and because there was a big time gap in between people receiving these comments.

- The final presentations were liked, as everyone got to choose their own topics and the workload was fine. The expectations beforehand were what unclear however and the difference in level of the given presentations was pretty high. Next to that, the twenty minutes breaks in between each presentation lowered the interest and activeness of students that were not presenting greatly, and this was both not liked and seen as negatively affecting the presentations afterwards.

Next to workload/assignments, comments have been made about class participation, the test, the teacher and the TA. Since class participation had not been graded in another course, students were thrown off by the requirement and some felt like it was assessed unfairly. For the test, there was also a lot of confusion. This was mostly related to the question of why students had to do the test. The students did feel the test was doable, but some of those who did the test received a handful of sentences of feedback that were not useful for their SER. These students were unclear on how to improve in the future and felt somewhat hopeless.

Then for students who did not create a bond with the teacher, it felt like mr. Birkhölzer favoured some students over others. Some administrative mistakes made students less positive about the teacher as well. However, it was in general clear that Mr. Birkhölzer was open for feedback and was always willing to help everyone in a meeting or in class. Lastly, Ms. Petry was viewed as a good TA who was willing to help, give clarifications on feedback and explain the material. Students would have liked her to be a bit more confident on her own.

Overall, the course was perceived as somewhat problematic, due to some administrative errors and miscommunication and general student confusion. The content was however very useful and students did learn a lot.

#### *EduCo semester survey figures*

N = 18, scale: 1 (never) – 5 (always)

EduCo Criterion	Mean	SD
1. This course sufficiently conveyed both theoretical and applied knowledge.	3,44	1,17
2. This course featured both group and individual work.	3,61	1,25
3. During this course, students were provided with a sufficient level of guidance.	3,39	1,16
4. For this course, there was a variety of possibilities to prove your competence.	3,83	0,76
5. This course facilitated personalization.	3,06	0,85
6. This course related to the semester project and other courses.	2,22	1,08

7. The course material was useful and relevant.	3,89	0,99
8. This course allowed for an even distribution of the workload over time.	3,39	1,21
9. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear.	2,89	1,02
10. Feedback given by the TA (Alice) was complete, useful, clear, and timely.	3,22	1,08
11. Feedback given by the teacher (Yorick) was complete, useful, clear, and timely.	2,78	1,18
12. The teachers were sufficiently available for questions/feedback about the course.	3,50	1,07
13. The teachers seriously took students' feedback about the course into consideration.	3,44	1,17
14. Sufficient knowledge input and support was given to reach the learning goals set for this course.	3,33	1,11
15. The teachers taught the course in an engaging and effective way.	2,83	1,01
16. The format of the course was engaging and conducive to learning the course material.	2,94	1,03
17. The teacher (Yorick) is an effective teacher.	3,17	1,17
18. The teacher (Yorick) cared about the students, their progress, and successful course completion.	3,39	1,21
19. Overall, the teacher (Yorick) met my expectations for the quality of an ATLAS teacher.	3,06	1,27

20. What might the TA (Alice) do to better support student learning?

Most students thought the TA did well. Some ideas were for the TA to be more confident on her own, to be more proactive, prepare a bit better for hard questions, be more involved during class and engage people more. Lastly, some students noted that the feedback could have been more elaborate, saying more precisely where people stand concerning their progress.

21. How comfortable did you feel voicing your opinions?	3,28	1,33
22. Overall, this course met my expectations for the quality of an ATLAS course.	2,83	1,12
23. The course was useful in progress towards my degree.	3,67	0,94

24. What specific changes would you recommend to improve this course?

Most students would have preferred more explanations about the material in the form of lectures before having to make homework. Some said shorter class-time (in one sitting) would have been

more useful. One added that the division for group A and B should give the groups an actually different content or method. Furthermore, some mentioned that more clarity about being in the safe zone, as well as what to do to pass the course or need to take the test. Next, a couple students mentioned clear and explicit feedback throughout the course would have been more helpful that all big issues being pointed out at the end, right before the test. Lastly, one added that feedback in the form of the rubric for the midterm assignment from the teacher would have been a useful addition to the student feedback.

25. The assessment rubric contained five dimension. Did you collect evidence and receive appropriate feedback in all dimensions?

In this case, about half of the people noted to have collected evidence, with some saying it was not much, or mostly from the midterm. One argued that explicit confirmation on the midterm peer-feedback from the teacher would have helped. The other half that disagreed noted that they were missing feedback either in one dimension or over multiple dimensions and were unsure about the rubric or the midterm assignment.

26. Is there a dimension which should be addressed more in class?

Documentation was mentioned a couple times, as well as modelling. Computational skills and mathematica were both mentioned once. Lastly, two students would have liked a different way of teaching and participating in class all together.

27. The teacher highlighted also non-math concepts, like mindsets, stress curve, and importance of fostering development. Did you find it useful?

3 of the 16 answers in this part were negative. 3 students were neutral, of who one was saying it was useful but out of place. The other 10 were positive, although 2 of them mentioned it was a bit too long or detailed.

#### *Other remarks from the survey*

One person noted it was not their favourite course due to multiple cases miscommunication. Another noted that the way the course was taught had caused a lot of problems for him/her personally. The next comment was that the amount of homework was out of balance with the feedback reward. The last person shared their opinion that they liked how the teacher mentioned the stress curve and mentoring/ guidance in Atlas.

#### *Suggestions from EduCo*

Our suggestions can be split up relating to a couple categories, namely workload, the assignments (homework, midterm and the presentation), class participation, the test and the course itself.

For the midterm assignment, EduCo concluded that there were two goals present within the assignment. The first was to test the understanding, application (modelling) capabilities, computational skills, use of mathematical software, and the communicational skills of the

students. The second goal was to see how deep students would be able to go by challenging them. For the basic understanding, meaning the first goal, the assignment was too difficult, mostly because some topics were not discussed during lectures yet. Our recommendation is therefore to communicate with the class the need to go beyond the discussed chapters in the book. In the assessment, the peer review system worked well and was often an extra learning moment. Also, not having answers to the questions available was good to make sure students would work it out themselves. However, what we recommend that needs to change in the assessment is that the answer sheets do need to be provided after the peer review deadline. Next, the peer review needs to be checked by the teacher or TA to give the certainty that the received peer feedback is correct.

As a separate point that came up during the midterm assessment, we would like to see that all students get their feedback at the same time. If it is possible to set a timer for the releasement of feedback in Canvas, it could be used to ensure this happens. If there is not such a system, there should at least be communication about the latest moment students will get their feedback (i.e. give the date before which it will be finished).

For the final presentations, we as EduCo would advice to keep the option of choosing your own topic as it was done this year. The expectations of the presentation should be improved, since it was unclear what exactly was expected, which was part of the reason for the clear distinction in levels between the presentations. Lastly, the feedback session after every presentation was nice for those that had presented, but it was too much time for the students that had to wait. This negatively affected the following presentations, and we would therefore advice to shorten the feedback sessions to ten minutes, or wait for two presentations and create a break/ double feedback session of 30 to 40 minutes. Another option is to have a five minute break and give only written feedback to the presenters later.

Next, the assessment of class participation was confusing and unclear to most students. We suggest that Mr. Birkhölzer and Ms. Petry explain more about this at the beginning of the course, giving clear examples on what they are assessing and mentioning that the participation is based upon growth. It would also be important to note that students who are more quiet (personality wise) could show participation by asking questions at the end of class for example.

To move on to the test, we advise Mr. Birkhölzer to make personalized emails, wherein he clearly states the reason(s) behind being selected for the test. This would be instead of the general list of possible reasons, to avoid confusion. The distinction between recommendation and requirement of doing the test was very nice, since it gave students an extra sense of how they were doing in the course. Next, some students got a very small amount of final feedback with the results of their test. According to Mr. Birkhölzer and Ms. Petry, it was often due to poor participation and performance, which made it impossible to give much constructive feedback. When this was the case, we would recommend to mention it, since it would reduce the confusion.

Then for the course itself, the four hours of class were fatiguing and too long. When students take too long to answer questions, Mr. Birkhölzer or Ms. Petry should jump in to keep up the pace of the discussion. EduCo has already asked to do so during the course, as well as the question for a

small lecture about the topic for the upcoming week. This was implemented in the fifth week of the course and allowed the lectures to hold students' attention for longer. Finally, the content of the classes was fine for most. However, some students had had experience with linear algebra and felt the material was somewhat repetitive. An idea for next year would be to give the group with pre-knowledge some more challenging concepts, theories and assignments.

### *Agreements with Yorick Birkholzer and Alice Petry*

In contrast with the students' view, general the workload was not too much from Mr. Birkhölzer's and Ms. Petry's perspective. The workload of the midterm assignment was acknowledged as being to high. We have discussed to change the questions and/ or to explain the knowledge needed for the assignments beforehand. Mr. Birkhölzer and Ms. Petry added that they will most likely change the weekly homework assignments next year, since they want to discuss more content in the course. The easy exercises from homework will therefore either be skipped or become recommended for those that have difficulties.

Mr. Birkhölzer is also planning to tackle the issues with the final presentation, which were unclear expectations and difference in level of student presentations. He wants to organise a mandatory feedback session with the teacher and group one or two weeks before the presentation deadline, to give students time to change into the right direction.

Next, it was discussed that students had not read the test questions carefully enough and had made computational mistakes by being nervous or too quick. Together with Mr. Birkhölzer and Ms. Petry we, EduCo, concluded that it would have been nice if more than just computational skills were measured. We agreed that next year applicational and modelling questions will be added, which would also prevent the frequency of computational errors, since that diminished the purpose of measuring the understanding of the concepts.

As a small addition to the topic of the test, Mr. Birkhölzer had made a comment at the beginning of the test about focussing on making the exercises well instead of the most amount of points scoring points. This created a wrong image, since scoring points was the way the test was assessed in the end. Mr. Birkhölzer agreed that he should not have said that.

All other points that were discussed, noted in the 'Overall perception of the course' and 'Suggestions from EduCo', have been agreed on and will be taken into account by Mr. Birkhölzer and Ms. Petry next year.

## Domain of Natural Sciences/Engineering

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Semester; Year; Class: Semester one; 2018/2019; class of 2021

Teachers: Martin van der Hoef, Jasper Homminga, and Jose Alvarez Chavez

### Newtonian Mechanics

#### *Summary of the course - Newtonian Mechanics*

The student is able to translate a real-world problem into a physics/mathematics model. He masters basic physics, which include Units & Uncertainty, Movement, Newton's laws, Work, Energy, Power, and Momentum. Additionally the student can communicate efficiently about engineering problem and can present solutions in clear logical steps, with explanations/pictures.

To complete the course a variety of assignments are provided that can be done to one's own choosing as long as all of the learning goals are reached doing so.

#### *Overall perception of the course*

The course was generally liked by students, as both Jasper and Jose seemed passionate about the material they taught. The concept checks were generally seen as fair and liked by students, however considering the class didn't go that deep into a subject required a lot of initiative to solve.

#### *EduCo semester survey figures*

N = 18, scale: 1 (never) – 5 (always)

EduCo Criterion	Mean	SD
1. This course sufficiently conveyed both theoretical and applied knowledge.	4.00	0.78
2. This course featured both group and individual work.	2.72	0.94
3. During this course, students were provided with a sufficient level of guidance.	3.50	0.89
4. For this course, there was a variety of possibilities to prove your competence.	3.83	0.98
5. This course facilitated personalization.	2.38	0.81
6. This course related to the semester project and other courses.	2.78	0.80
7. The course material was useful and relevant.	3.78	0.67

8. This course allowed for an even distribution of the workload over time.	4.16	0.83
9. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear.	4.39	0.68
10. Feedback given by the teachers was complete, useful and timely.	4.33	0.67
11. The teachers were sufficiently available for questions/feedback about the course.	4.22	0.69
12. The teachers seriously took students' feedback about the course into consideration.	3.89	0.71
13. Sufficient knowledge input and support was given to reach the learning goals set for this course.	3.89	0.8
14. The teachers taught the course in an engaging and effective way.	4.11	0.79
15. The format of the course was engaging and conducive to learning the course material.	4.17	0.96

#### *Other remarks from the survey*

It was mentioned that the amount of feedback received for take home exams was a bit unclear until the end of the course. Another student mentioned that the deadlines should be spread out more evenly, as there only was one true deadline, which they found a bit to loose. Where students would probably postpone assignment till the end and then be overwhelmed, at last receiving an answer sheet for the in class assignments was something a student suggested.

#### *Suggestions from EduCo*

It was concluded that students were sometimes a bit lost during the lecture, not knowing what exactly was going on, specifically with Jose, where a short briefing or introduction would solve this. Considering the complexity of concept checks a summary of the material would be useful to have as certain parts were not adequately covered by the book either or hard to find.

Some of the lectures were decently fast paced, to an extent that some students couldn't keep up, thus losing interest and finding no reason to go, considering they can't keep up anyways. This could be solved by having the students who understood the material do the practice exercises while the rest could have a recap. Leading to next point, the practice exercises contained no answers, which on one hand forces the students to look into the topic a bit more, but eventually the student should be able to confirm their results with the correct ones.

### *Agreements with Jasper Homminga, and Jose Alvarez Chavez*

Jasper Homminga agreed to most of the points mentioned and stated that he would either look further into it or agreed to what we stated. The two points he wasn't sure about, were giving the answers for the assignments and secondly having mandatory homework or more deadlines.

Jose Alvarez Chavez agreed to the points mentioned quite enthusiastically, but did not inquire any further than what was mentioned. The following above was mentioned and one additional point that his feedback was not as elaborate as Jasper Hommingas, which it should be, considering it would be unfair to students.

### *Fluid and heat*

#### *Summary of the course - Fluid and Heat*

The focus of this course will not be on the fundamental principles, but rather on engineering applications. The goal of the course is that you can make some quick and simple calculations for problems concerning heat and fluid flow, and get acquainted with calculations that are a step beyond the high school level; You will have to construct simple differential equations, and solve them.

There are 6 plenary "lecture sessions" of 2 hours each planned. These lecture sessions are introductory and will to some extent be interactive: they will start with a problem which you try to solve, which is followed by a short lecture on the physics you may need to get to a more accurate answer, which you then apply etc. The real study should come afterwards by yourself, by reading through the book and making the exercises, which you can do at home or during the guided self study sessions.

#### *Overall perception of the course*

Overall the students really liked the lectures, largely due to Martins Van Der Hoef teaching style, where many considered the course itself as successful in terms of delivering the content and being enjoyable. However the lectures sometimes felt a bit vague or hard to follow, which partly was due to the unclear, cursive handwriting.

#### *EduCo semester survey figures*

N = 18, scale: 1 (never) – 5 (always)

EduCo Criterion	Mean	SD
1. This course sufficiently conveyed both theoretical and applied knowledge.	4.72	0.43
2. This course featured both group and individual work.	3.89	0.70
3. During this course, students were provided with a sufficient level of guidance.	4.33	0.59

4. For this course, there was a variety of possibilities to prove your competence.	3.83	0.68
5. This course facilitated personalization.	3.06	0.74
6. This course related to the semester project and other courses.	2.83	0.89
7. The course material was useful and relevant.	4.39	0.48
8. This course allowed for an even distribution of the workload over time.	4.61	0.52
9. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear.	4.56	0.44
10. Feedback given by the teacher was complete, useful and timely.	4.50	0.61
11. The teacher was sufficiently available for questions/feedback about the course.	4.33	0.69
12. The teacher seriously took students' feedback about the course into consideration.	3.94	0.66
13. Sufficient knowledge input and support was given to reach the learning goals set for this course.	4.39	0.54
14. The teacher taught the course in an engaging and effective way.	4.22	0.60
15. The format of the course was engaging and conducive to learning the course material.	4.17	0.56

#### *Other remarks from the survey*

There were two additional remarks from the survey, one complementing the setup of the class, the other mentioning that the practice exercises could have been made a bit more clear.

#### *Suggestions from EduCo*

Some students felt that there was a given vagueness to the class and assignments, which could be solved by looking at some additional exercises during thursday's class, to allow students to get a better grasp of the material. Additionally considering the class on thursdays currently serves as a working session, it could also be used as a tutorial for the students who need it.

The assignments were rather close to the readings that taught the material needed for a specific assignments, giving students little time to reflect and work on example problems, thus by moving the deadlines to a later date, more time would be given to the students to study. Where a lot of the material learned was not in the textbook itself, making it hard for those who missed a class or couldn't keep up, hence giving a formula sheet or some kind of summary would be handy.

### *Agreements with Martin van der Hoef*

He liked the idea of doing practice assignments during thursday's class to help students understand the material better. The second point mentioned, that students would appreciate more time for given assignments would generally be double if more time was available, he will look into it, but isn't sure if there is enough time. Lastly he said that he will solve the problem that students who missed the class had no way of learning the material.

## Domain of Social Science

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Semester; Year; Class: Semester one; 2018/2019; class of 2021

Teacher(s): Ardion Beldad, Pascal Wilhelm, and Margoth Gonzalez Woge

### Introduction to social science

#### *Summary of the course – Introduction to social science*

This course is taught by means of interactive lectures and discussions on fundamental social science themes. The goal of introduction to social science is to introduce the student with the most important topics and methods in the social science domain. You should be able to apply theoretical and methodological knowledge to analyze behavioral or social issues and themes. The student is able to provide evidence by making a proof of concept, doing a social science project along with leading a discussion on a social science topic during class.

#### Overall perception of the course

The students agreed that the course was an introduction to social science since every lecture another topic from the social science domain was discussed. The students also stated to overall like the course. However, they still had some remarks firstly on the course itself. For the lectures the students did not read the given papers properly, this was partially because the papers were not discussed during the session. Another remark was that the students would liked to have more explanations about theories during class since they are expected to apply them. The POC was said to be more about writing a good report fast then really testing your social science understanding. Also, the students did not feel prepared for the POC, however the given rubric was a nice basis to see where to improve. Although, there was a problem with feedback consistency. Some teachers gave very specific and elaborate feedback in the document itself while others barely gave any written feedback. This resulted in students not knowing where exactly and how to improve. The students did like the student-led discussions, however mentioned that it was superficial because of students not preparing for the discussions. The students also liked the group project, but argued that it needs fine tuning. The analysis part was clear however the other parts were said to be vague sometimes.

#### *EduCo semester survey figures*

N = 18, scale: 1 (never) – 5 (always)

EduCo Criterion	Mean	SD

1. This course sufficiently conveyed both theoretical and applied knowledge.	3,67	0,97
2. This course featured both group and individual work.	4,22	0,88
3. During this course students were provided with a sufficient level of guidance.	3,50	0,76
4. For this course, there was a variety of possibilities to prove your competence.	4,28	0,57
5. This course facilitated personalization.	3,56	0,98
6. This course related to the semester project and other courses.	3,33	1,03
7. The course material was useful and relevant.	4,00	0,49
8. This course allowed for an even distribution of the workload over time.	3,56	0,92
9. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear.	3,72	0,96
10. Feedback given by the teacher(s) was complete, useful and timely.	2,72	1,02
11. The teacher was sufficiently available for questions/feedback about the course.	3,72	0,75
12. The teacher seriously took students' feedback about the course into consideration.	3,72	0,75
13. Sufficient knowledge input and support was given to reach the learning goals set for this course.	3,83	0,51
14. The teacher(s) taught the course in an engaging and effective way.	3,44	0,78
15. The format of the course was engaging and conducive to learning the course material.	3,06	0,56

### *Other remarks from the survey*

Students mentioned that they experienced the lectures as too rushed and should have been more in depth. The students state that they ended up with an overall vague idea of the content since you did not apply the knowledge on each topic equally. Furthermore, the students have strong opinions about the POC. They mention the feedback was given in some cases excessively late while students were badly informed about what was going to happen. Also lowering the expectations of the POC affected the integrity of the program on honours level.

Other ideas that were suggested;

- Have a discussion amongst the feedback givers to get on the same page about how the feedback will be given.
- More information on how to write a research proposal; have a practice session on it.

### *Suggestion from EduCo*

Firstly for the lectures, EduCo suggested that the papers given to be read beforehand should add to the understanding of the lectures given in class. For the POC, EduCo suggested that there should be lectures on how to write a research proposal. Also, there should be instructions provided on how to write a case analysis and some practice moment to try a POC.

For the student-led discussions we mentioned to be more specific on what ATLAS wants us to do with the content of the presentations and the first group should be given some extra guidance into how a discussion works.

#### *Agreements with* Ardion Beldad, Pascal Wilhelm, and Margoth Gonzalez Woge

Ardion stated to have talked to Pascal to consider scrapping the student-led discussions to have more time to go in-depth and explain more models and theories during lectures. Margoth mentioned she is very open to change and get better and therefore wants to keep the conversation open between her and EduCo as well as the class, to understand how she is doing and how the class is doing. Pascal said that if the student-led discussions would still be added in the course, clearer instructions and guidance would be given to the students. The other suggestions were also mentioned however not noted down where the teachers agreed to.

## Modelling week

Created by: Dhirendra Adiprakoso

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Semester; Year; Class: Semester one; 2018/2019; class of 2021

Teachers: Martin Streng, and Leonie Krab.

### *Summary of the week*

All scientific reasoning and communication about aspects of the real world rely on a representation of relevant parts of the real world into some language. These can be mathematical formulas, drawings, causal relationship diagrams, descriptive texts, etc. Throughout the semester, you encountered several theories, from various disciplines within the three domains, each employing some kind of modelling. In this introductory course on modelling, we shift the discussion from “what is modelled” to “what is a model”. This gives a starting point for the ability to recognise commonalities between the natural and the social sciences, and a basis for developing interdisciplinary research skills. The course takes one full week. Students will be given a task to fully apply their modelling skills throughout the week.

### *Overall perception of the week*

The overall perception of Modelling Week from the students was mixed. There were students who felt that the week was useful and that they learned a lot from the task provided. However, there were also students who felt the task had nothing to do with modelling and that the week was, in retrospect, not useful. The task was thought to be too improvised by the teachers, and that throughout the week, expectations were changed constantly, which caused confusion amongst the students. Furthermore, some students felt that the task did not sufficiently provide them with evidence to prove their learning of their semester goals. This was a particular worry shared by most students.

Despite this, the timeslots for daily presentations and adequate workload was very impressionable from the student’s point of view. They allowed the students to reduce the amount of stress they had, especially towards the end of the semester, and the presentations helped to gain inspiration for solutions in order to complete the task provided for the week.

### *EduCo semester survey figures*

$N = 18$ , scale: 1 (never) – 5 (always)

EduCo Criterion	Mean	SD
1. This week sufficiently conveyed both theoretical and applied knowledge.	3,22	1,22

2. During this week, students were provided with a sufficient level of guidance.	3,06	0,94
3. For this week, there was a variety of possibilities to prove your competence.	3,17	1,15
4. This week facilitated personalization.	3,67	1,28
5. This week related to other courses.	2,94	1,30
6. The material was useful and relevant.	3,00	1,41
7. This week allowed for an even distribution of the workload over time.	3,94	1,06
8. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear.	3,56	1,29
9. Feedback given by the teachers was complete, useful and timely	4,00	0,97
10. The teachers were sufficiently available for questions/feedback about the week.	3,83	0,86
11. The teachers taught the week in an engaging and effective way.	3,11	1,08
12. The format of the week was engaging and conducive to learning the course material.	3,44	1,38

#### *Other remarks from the survey*

As mentioned before, students remark from the survey about Modelling Week were mixed. However, what was a common remark was the need for a more theoretical background with regards to modelling. This would have helped students when conducting the task given during the week.

#### *Suggestion from EduCo*

Seeing as students felt that there was a lack of modelling conducted during the week, as well as a lack of theoretical background, EduCo suggests adding this aspect for future modelling weeks. This will not only help students understand the whole idea behind modelling but also to provide them with evidence as part of their semester goal regarding modelling. Moreover, maintaining the daily presentations would be useful as well, since most students agreed that this was a very beneficial aspect of the week.

### *Agreements with Martin Streng, and Leonie Krab*

When discussing the Modelling Week with Martin Streng and Leonie Krab, it was understood that students had confusion throughout the week. However, the 'freedom to explore' was there to induce creativity amongst the students. To work on this was understood by the teachers. Martin and Leonie also agreed to be more clear on theoretical backgrounds required to conduct modelling, in order for students to have evidence in achieving their semester goals. The reduced workload was also seen by the teachers as a way to optimise the creativity of students, and it is hoped to be continued for the future.

## Semester Project

Created by: Lisa Veldman

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Semester; Year; Class: Semester one; 2018/2019; class of 2021

Teacher: Marcus Pereira Pessoa

### *Summary of the project*

Teams of five students had to design a product-service system for a specific target group. Their product needed to include both intangible and tangible aspects. First, they had to specify their project description; had to select and define a relevant real-world socio-technical problem for which the PSS is a solution. Then their main stakeholders, or target group needed to be decided. Second, they designed, and evaluated a prototype of their product using a systematic and iterative approach.

### *Overall perception of the project*

The overall perception of the project was positive. The students enjoyed the level of complexity, the content, the outcome, and the workload. However, the students' expectations were different than the actual outcome of the project, students expected and were told that all the courses of the first semester would be implemented into the project, but that was not the case (see below for survey results, question two). In addition, students expected to make an actual prototype, nevertheless this project was more about the process behind designing a product.

Also, the instructions for the deliverables were sometimes a bit unclear, for example what exactly functional analysis entailed in deliverable 2. This was supposed to be cleared through the presentations during the design lectures, yet unfortunately this did not happen.

The tutors' availability was good. But it was clear that the tutors were not notified in a good enough manner of the concept and content of the project and deliverables. This caused some stress and frustration by students, since the feedback had some inconsistencies.

### *EduCo semester survey figures*

$N = 18$ , scale: 1 (never) – 5 (always)

EduCo Criterion	Mean	SD
1. In the project non-Dutch students were not put at a disadvantage.	3.89	1.63
2. All ATLAS domains/courses that were taught in this semester could be integrated in this project.	2.61	1.01

3. Tutors/consultants were informed about the project, and had relevant knowledge.	3.28	1.04
4. Tutors/consultants were readily available/accessible for students.	4.17	0.69
5. This project had a well-communicated and logical set-up.	3.44	1.01
6. The students were provided with relevant information/knowledge that could be readily applied within the project.	3.61	0.59
7. The project was based on a problem that includes both social and technical aspects.	4.28	0.87
8. This project clearly stated which assumptions may be made by the students.	3.06	0.85
9. The procedure for project assessment was clear in advance.	3.33	0.82

#### *Other remarks from the survey*

- Stick to one example throughout the design lectures, like only the washing machine one or the one with the photo cameras.
- Communicate clearly on the amount of information students can expect from the design lectures.

#### *Suggestions from EduCo*

We advise to make the design lectures more concrete, as in give clear information on the different concepts needed for the deliverables. Hopefully, this will result in lectures of approximately 60 minutes, which gives the groups also time to apply the new information in their projects that same day and discuss any questions with the tutors. Also, do not have more than one example in each lecture, to make sure it remains clear for students.

In addition, we would appreciate it if the tutors would be more notified of the content of the deliverables. Besides, there should be a well established basis for giving feedback that needs to be consistent, known, and used by all the tutors.

Another way to prevent miscommunication from happening is discussing the expectations of the project with the whole group at the beginning of the semester. Then make it also clear that the project is also all about the learning curve of the students. Also, do not change the assignment during the project itself, like it happened with deliverable 3. Introduce this change already in advance or not at all.

### *Agreements with Marcus Pereira Pessoa*

Overall Marcus agreed with the suggestions made above. Next time, there will be more meetings with tutors to make sure that everyone is on the same page.

About the different expectations, he said that the steps before an actual prototype, thus the ones discussed in the project, are necessary. Of course, he would like to go further, but that would mean that the teams also need to work harder. This is a possibility, since in the first quarter students had too much free time, the workload was not high enough. Yet, increasing the workload of the semester project in the first quartile might not be the right solution for that, since it will make the teams more rushed, meaning more mistakes will be made. Marcus and Pascal Wilhelm (semester coordinator) are going to discuss this further.

## Self-Directed Learning

Created by: Dharendra Adiprakoso

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Semester; Year; Class: Semester one; 2018/2019; class of 2021

Teacher: Pascal Wilhelm and Ans Netjes

### *Summary of the Course - Self-Directed Learning*

The 'Self-Directed Learning' course enables students to have a first glance into ATLAS' philosophy of having students to conduct their own learning. In this course, students are guided through the various stages of the PDP-SER learning cycle. Teachers will provide guidance to enable students to understand what they need to do in order to achieve their learning goals and the goals for the semester. Students are also provided with the necessary tools to allow them to understand what is expected of them once they take part in ATLAS and also what is needed to be achieved to pass the semester.

### *Overall perception of the course*

Students perceived the course as helpful since the teachers were there when they needed them most, especially pertaining to writing the Personal Development Plan (PDP) and Self-Evaluation Report (SER). This gave the perception that the teachers knew what they were doing and were prepared for every session. Students especially favoured the idea of an open discussion where issues were listed down and discussed with the class as a whole. However so, students felt that the course still lacked the opportunity to conduct self-learning. Aside from that, teachers seemed to provide weak points when it comes to questions that appear to have a vague answer. This caused quite a confusion, especially when it came to evidence regarding modelling during SER writing. This persistent usage of 'beating around the bush' did not make the course as impressionable as expected from earlier in the semester.

### *EduCo semester survey figures*

N = ..., scale: 1 (never) – 5 (always)

EduCo Criterion	Mean	SD
1. This course sufficiently conveyed both theoretical and applied knowledge.	3,33	0,59
2. This course featured both group and individual work.	3,00	1,14
3. During this course, students were provided with a sufficient level of guidance.	3,89	0,83
4. The course material was useful and relevant.	4,17	0,62

5. This communication about schedules and deadlines was clear.	3,72	0,83
6. Feedback given by the teachers was complete, useful, and timely.	3,39	0,78
7. The teachers were sufficiently available for questions/feedback about the course.	4,00	0,77
8. The teachers seriously took students' feedback about the course into consideration.	3,78	0,65
9. The teachers taught the course in an engaging and effective way.	3,56	0,62
10. The format of the course was engaging and conducive to learning the course material.	3,39	0,70

#### *Other remarks from the survey*

Students remarked that this course was important, yet conducting practical work would have been useful, especially during the beginning of the course. This was to have more guidance when working on PDPs and SERs. Another remark was also to have the teachers aid the students in order for them to be adjusted to ATLAS. By getting a grip from the beginning, the course would have been seen as of much use later on in the semester.

#### *Suggestions from EduCo*

As mentioned above, one of the strengths of this course was the open discussions, where issues were listed down and discussed with the class as a whole. This is something that we, EduCo, believe should be maintained and carried forward in future years. This is because these type of sessions allow students to be able to direct their own learning, which is the main objective of the course. Another way to improve this aspect even further is to introduce where sessions, wherein teachers provide guidance on how to conduct a self-study and motivate the students to be the best learner they can be. This way, students are able to adequately take something from this course and should there be questions, they can easily find the answers themselves, while also keeping the teachers in mind for guidance seeking as well.

#### *Agreements with Pascal Wilhelm*

When discussing the course's overall perception and suggestions from EduCo, Pascal Wilhelm has met this feedback with open arms. The need for more guidance on how to be a self-directed learner is understood from Pascal and EduCo, as well as the idea of having a student-led discussion as one of the SDL session's agenda. Pascal also noted that these sessions were set up to aid students with regards to ATLAS' PDP-SER cycle, which is hoped to be continued in future years. Along with that, the suggestions from EduCo will be taken into consideration for future implementation.



## Communication

Created by: Klaske Houtsma

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Semester; Year; Class: Semester one; 2018/2019; class of 2021

Teacher(s): Ardion Beldad

### *Summary of the course – Communication*

The focus of the course communication is on academic writing competencies, which include the skills to (a) identify research problems, (b) formulate relevant and useful research questions and hypotheses, (c) use various scientific databases for relevant desk research information, (d) critically assess potential academic materials as research sources, (e) formulate and structure academic texts, and (f) employ the conventions in academic writing. These topics are discussed in workshops and interactive lectures.

### *Overall perception of the course*

The students mentioned that the course had potential, but it did not work out. The students liked the contents and topics of the lectures (apart from IB students for which the course felt redundant except for the citation lecture) and that the lectures were split in two blocks. However, they said that, the citation lecture should have been given before the first POC. Also, the students mentioned that the course should have included a lecture on how to write a research proposal.

### *EduCo semester survey figures*

N = 18, scale: 1 (never) – 5 (always)

EduCo Criterion	Mean	SD
1. This course sufficiently conveyed both theoretical and applied knowledge.	3,18	0,73
2. This course featured both group and individual work.	2,53	1,33
3. During this course students were provided with a sufficient level of guidance.	3,50	0,63
4. For this course, there was a variety of possibilities to prove your competence.	2,71	1,36
5. This course facilitated personalization.	2,35	0,86
6. This course related to the semester project and other courses.	3,88	0,93

7. The course material was useful and relevant.	3,88	0,93
8. This course allowed for an even distribution of the workload over time.	3,94	1,03
9. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear.	3,18	0,81
10. Feedback given by the teacher(s) was complete, useful and timely.	3,59	1,18
11. The teacher was sufficiently available for questions/feedback about the course.	4,00	0,79
12. The teacher seriously took students' feedback about the course into consideration.	4,00	0,87
13. Sufficient knowledge input and support was given to reach the learning goals set for this course.	3,65	0,61
14. The teacher taught the course in an engaging and effective way.	3,35	0,79
15. The format of the course was engaging and conducive to learning the course material.	3,06	0,83

#### *Other remarks from the survey*

Students stated to have expected more writing in the course. They would have liked to have done some more practice exercises and get feedback on it. Furthermore, they argued that the course should have provided some actual assignments instead of students coming up with assignments themselves.

#### *Suggestions from EduCo*

EduCo suggested to add a lecture on writing a research proposal and to include an assignment, for example writing an essay on a topic and the topics discussed during lectures.

#### *Agreements with Ardion Beldad*

No agreements were specifically made or written down with Ardion. The suggestions have been discussed with him in person.

## Semester One as a Whole

Created by: Joop Arts

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Semester; Year; Class: Semester one; 2018/2019; class of 2021

Coordinator: Pascal Wilhelm

### *Overall perception of the semester*

At the start of the semester, several students felt they got limited feedback on their PDPs. Furthermore, during the second round of feedback, several students got the same feedback as during the first round, indicating that the initial feedback was unclear.

Throughout the semester, students felt there was oftentimes a lack of communication between the teachers and students. They often had to scour canvas, emails and syllabuses to find academic information. Furthermore, many changed deadlines could have been communicated more clearly by teachers. Several times moved deadlines were communicated by hearsay of the students, which is less reliable. Students also had false expectations that the courses to come together in the project. They felt that the lack thereof such was not an issue, but were simply disappointed that this was a miscommunication.

When trying to write about their semester goals in the SER, students had difficulty with goal 3, which many had planned to prove completion of using evidence gained during modelling week, but felt they had not covered the “compare and contrast” aspect of the goal.

Students were frustrated with the slow pace at the start of the semester. We know from the second years that the past semester one was much more packed, especially at the start of the semester.

### *EduCo semester survey figures*

N = 18, scale: 1 (never) – 5 (always)

EduCo Criterion	Mean	SD
1. The semester planning was clear and changes were communicated in time.	3,33	1,03
2. The expectations for this semester were clear.	3,89	0,83
3. An evenly spread out workload throughout the semester was possible.	2,94	1,00

4. The semester was coherent.	3,22	0,81
5. During the semester students were introduced to various topics that can assist them in narrowing down their interests towards a possible Master's program.	3,39	1,24
6. The semester allowed for personalization.	2,94	1,06
7. Each student had an informed mentor that helped the student in this/her academic and personal development.	3,89	1,23

#### *Other remarks from the survey*

One student expressed wanting more required mentor meetings at the beginning of the year for more guidance. Another expressed general content with the semester.

#### *Suggestions from EduCo*

EduCo would like there to be more consistent PDP feedback.

EduCo expressed to Pascal that we would like the teachers and semester coordinators to be more consistent in where they upload each type of academic document.

EduCo also suggested that it not be advertised that courses build up to the project. Furthermore, EduCo asked that goal 3 either be reworded or addressed differently throughout the semester.

EduCo also suggests that the semester one workload in the future does not start off as light as this time. While the workload amount that was built to was appreciated, the start can be heavier.

#### *Agreements with Pascal Wilhelm*

Overall, Pascal agreed with the statements student made regarding the semester and the EduCo suggestions, and says that he will use these considerations when planning future semesters. The Programme Committee is currently working on addressing the issue of consistent PDP feedback.