



ATLAS

# EduCo Semester Documentation

Semester 3, 2016/17,  
Class of 2018

Stef Koenis, Leron Kok, Frank Kwakkelaar, Tim Roelofs,  
Kamiel Verhelst  
November 2016 – March 2017

## Introduction

This EduCo semester documentation consists of the evaluations of the courses, the project and the semester as a whole. All the evaluations have a similar structure: first, a short summary of the course/project/semester is given, followed by a discussion based on the results of the [EduCo semester survey](#) - which is based on the “[EduCo criteria](#)”. In this discussion, the strengths and weaknesses of a course/project/semester will be pointed out. Then, solutions to these problems are suggested and in the last section, the agreements that were made with the teacher/coordinator are described. For the semester survey results, the results are shown in a 1-5 scale. Certain surveys implemented the 1-7 scale as a small experimentation, but for consistency, they were converted to 1-5 for consistency. The 1-5 scale will be kept for future documentations.

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## Semester

created by: Frank Kwakkelaar  
e-mail: f.kwakkelaar@student.utwente.nl  
year/semester: Semester 3, 2016, class of 2018  
semester coordinators: Leonie Krab

## Summary of the course

The semester's theme was research. In the [semester syllabus](#), five of the ten semester goals were explicitly about research, such as learning how to write a research proposal (#9) and putting research into a broader context (#7). Other semester goals were about gaining proficiency in modelling and domain knowledge. The courses offered by ATLAS were Signals, Systems & Transformations (SST), empirical evidence (EE), social science seminars (SSS), research methodology II: formal methods (RM II), research methodology I: model-based reasoning (RM I), algorithms & programming (A&P) and the elective artificial intelligence (AI). Additionally, 5 ECs of electives were required. The project was writing a research proposal about living in an extreme condition. The dominant learning lines were research and interdisciplinarity.

## EduCo semester survey

(n=24, scale 1-5)

EduCo criterion	mean	SD
1. The semester planning was clear and changes were communicated in time	2.8	1.4
2. The expectations for this semester were clear	3.1	0.9
3. An evenly spread out workload throughout the semester was possible	3.2	1.2
4. The semester was coherent	3.6	1.0
5. Students were able to make informed and meaningful choices about the combination of courses within the semester	3.0	1.1
6. During the semester students were introduced to various topics that can assist them in narrowing down their interests towards a possible Master's program.	3.0	1.2
7. The semester allowed for personalization	3.9	1.0
8. Each student had an informed mentor that helped the student in his/her academic and personal development	4.1	0.9

## Discussion

The semester as a whole was coherent for students (3.6 for criterion 4); it came across clearly that research was the prime focus of the semester, and this manifested itself, either implicitly or explicitly, in most of the courses and the project. However, this coherence meant that students were not sure on how courses were differentiated and integrated. For example, empirical evidence was under the engineering domain although it included a social science lab, and the social science seminars and RMII were designed as an integrated course, but students (and the EduCo) perceived it as separate courses.

Students perceived the semester as being the lightest one so far in terms of actual subject knowledge. Courses like RMI, RMII, SSS, and EE helped students learn how to think and see things with a research-focused perspective (and thereby really contributed to the [semester goals](#)), but had little concrete content compared to courses like SST and A&P. Part of this perception may be due to the lack of an engineering course in the semester, due to the removal of the material science course from last year.

The semester offered 5 ECs of electives, and the elective was tied to the project (7 ECs). For a minority of students, the limited elective space and the importance it had on the overall semester reduced the quality of their semester. This is because students that chose an elective that they regretted felt trapped into dedicating a large portion of the semester to it. Only a minority of students had this problem, so this is not reflected in the survey. However, those that did have the problem suffered disproportionately because of it. Most students positively reacted to having the ability to choose external electives, leading to high scores for personalization and spread of workload (3.9 for criterion 7 and 3.2 for criterion 3).

Communication during the semester varied in quality (2.8 for criterion 1). Some important information regarding the semester was not readily available on time, such as the learning goals of the semester, and not all announcements were clear. For instance, the peer review assignment for the project was not properly explained, and was only clarified by asking in person. Other times, announcements were only on blackboard and not through email, which caused some students to miss them.

Mentoring was positively received this semester (4.1 for criterion 8), and this was attributed to the fact that students could choose their own mentors, as opposed to being appointed one for the first year.

## Suggestions to improve the course

The following solutions are suggested to improve this course:

- Provide information about the influence of the elective on the project, so students can make more informed decisions
- Add an engineering course.
- Add more elective space, to give students extra room to try more electives, and therefore pick the appropriate one that they could dedicate themselves to in the project

## Agreements

The following agreements (which apply to semester 3 2017) have been made with the semester coordinator (Leonie):

- There will be an engineering course. The specific course and how it will fit in the semester will be determined by the next semester 3 team.
- There will be an increase in the elective space, and the importance of the elective chosen for the project will be emphasized, so that students can make more informed decisions.
- Important announcements will be announced via both blackboard and email
- Semester and learning goals, as well as their descriptions, will be ready before the start of the semester.

## Project

created by: Tim Roelofs

e-mail: t.j.t.roelofs@student.utwente.nl

year/semester: Semester 3, 2016, class of 2018

project coordinator: Mieke Boon

## Summary of the course

The theme of this project was “Living in extreme conditions”. In the project, students were supposed to write a research proposal concerning a problem or question relevant to a topic related to this theme. This proposal was written in groups of about six students, who started off from one overarching problem before splitting up in duos (this will be discussed later in the ‘Electives’ section as well). Each duo would write their own subproposal, for which they could use their expertise from their elective(s). These subproposals were then integrated into one proposal for the whole project group. Each project group had one assigned consultant to whom the group could ask questions. Next to the consultants, each duo was supposed to find an expert to answer questions about their specific topics.

Project workshops and consultancy sessions were organized to facilitate the project. The assessment consisted of a presentation for and a discussion with a group of staff members of which three assessors. The consulted experts were also invited to either attend this session or send questions to ask during the assessment. After the assessment, the group as a whole received some written feedback, with each duo also received a verdict (poor/fair/good/very good/excellent) and written feedback specific to their subproposal (strong and weak points).

More information on the project can be found in the [semester syllabus](#).

## EduCo semester survey

(n=24, scale 1-5)

EduCo Criteria	Score	SD
1. In the project non-Dutch students were not put at a disadvantage	4.1	1.5
2. All ATLAS domains/courses that were taught in this semester could be integrated in this project	3.3	.92
3. Tutors/consultants were informed about the project, and had relevant knowledge	3.8	.83
4. Tutors/consultants were readily available/accessible for students.	4.5	.65
5. This project had a well-communicated and logical set-up	3.2	1.1
6. The students were provided with relevant information/knowledge that could be readily applied within the project	3.5	.82
7. The project was based on a problem that includes both social and technical aspects	3.9	.83
8. This project clearly stated which assumptions may be made by the students	2.6	.90
9. The procedure for project assessment was clear in advance	3.2	1.1

## Discussion

The survey's results were positive on all items. Compared to last year's survey results, almost all scores improved slightly. Especially on criteria 3 and 9 the score improved quite a bit. As the usefulness of the consultants and the clarity of the assessment procedure that were highlighted as improvement points in last year's Semester Documentation, it is good to see a higher score on these two items. However, there were still some suggestions for improvement in the survey results. One student suggested that perhaps having two consultants instead of one would give students more input. Another student said that there were 'a number of miscommunications between the coordinator and our tutor'. The consultants also seemed to be inconsistent with each other, e.g. regarding the importance of the integration of subtopics.

One issue that some people had concerned the supposed integration of students' electives in the project. Not all students felt like they were able to use the expertise from their electives, e.g. due to their electives being too fundamental/theoretical/practice-oriented in nature. These students were put at a disadvantage in the project as they had to become experts in another field where others could just use the expertise from their elective.

A minor improvement point is criteria 8. Some students were not sure about what assumptions they could make, such as what knowledge they could expect their audience to have.

## Suggested solutions to problems

- Better communication to students about how to choose electives will make them less likely to choose electives that cannot be used for the project (unintentionally).
- Two consultants per group (?) / an improvement of communication with consultants

## Agreements

The following solutions (which would apply to semester 3 2017) have been made during a session with Mieke (project coordinator), Leonie (semester coordinator), and Miles and Koray (project consultants):

- The project-elective link will be clarified to students. A project workshop about the semester 3 workshop will be held at the end of semester 2 to inform students about this project. Students will still get the possibility to choose non-project electives (like this year), but they will be made more aware of the consequences beforehand.
- Generally, every consultant will have their own opinion, so there will always be inconsistencies. However, they should be aware of and consistent with regards to the examination criteria.
- Having two consultants per group would be too much work. Students were allowed to ask other consultants for help this year but that did not seem to happen, so students will be made more aware of that next year by putting it in the handout.

## Empirical Evidence

created by: Kamiel Verhelst

e-mail: k.j.verhelst@student.utwente.nl

year/semester: Semester 3, 2016, class of 2018

teacher: Fokko Jan Dijksterhuis (Bernard Veldkamp, Martin Streng)

### Summary of the course

The general aim of this course was to give students practical experience with acquiring data, for both social and natural sciences and to shed light on the meaning and challenges of empirical evidence. Besides this, it focused on comparing natural and social sciences in terms of research *practices*, thereby adding an extra dimension to the Social Science Seminars. The course consisted of four parts: a case study (on a provided paper), Social Science lab work, SST lab work and a reflection, of which the last two were done individually. No recurring sessions were planned for this course.

### EduCo criteria

(n=20, scale 1-5)

<b>EduCo criterion</b>	<b>mean</b>	<b>SD</b>
1. When possible, this course conveys both theoretical and applicable knowledge	2.6	1.0
2. This course features both group and individual work	3.6	1.0
3. During the course, students are provided with a sufficient level of guidance	2.9	0.9
4. For this course, there is a variety of possibilities to prove your competence	2.7	1.1
5. This course facilitates personalisation	2.1	0.8
6. This course relates to the semester project and the other courses	3.5	1.1
7. This course allows for an even distribution of the workload over time	3.9	0.9
8. The communication about learning goals, schedule, deadlines and possibilities for evidence is clear.	3.5	0.9
9. Feedback given by the teacher(s) is complete, useful and timely	3.5	0.6
10. The teacher is sufficiently available for questions/feedback about the course	3.7	0.9
11. The teacher seriously takes students' feedback about the course into consideration	3.7	0.8
12. Sufficient knowledge input and support is given to reach the learning goals set for this course	2.8	1.0

### Discussion

The points mentioned here are conclusions Kamiel and Stef reached in their discussion with Fokko Jan. In general, the course was set-up well, communication about assignments was clear and feedback was good and timely.

However, it seemed like this course lay in the background of the semester. Students indicated that they expected to

spend more time on the course, that it wasn't worth 3 EC. Linked to this, is the experience of students that the course did not provide enough theoretical background, but was purely focused on assignments. There was nothing to fall back on after presentations or missing one of the sessions. (Hence the 2.6 for criterion 1.)

To add to that, it proved to be hard for students to relate the course to the other courses in the semester. They did see that there was a relationship (3.5 for criterion 6) and state that the communication was clear (3.5 for criterion 8), but they didn't seem to know how exactly the courses related (judging from their qualitative statements). The fact that the course was part of the Engineering domain was confusing.

Another main point are the practicals, for which students expected more *depth, length and customizability* (notice the 2.1 for criterion 5). Students indicate that they would have liked to choose a practical that suited their interests. The goal of the practicals was *not to set up*, but only *to execute* and *draw conclusions from* experiments (so not the 'full empirical cycle'). The focus was also not as much on the content but on the methodology. This was not communicated well and led to confusion among students, who put more focus on the specifics (team behavior, signal analysis).

Lastly, the course ended quite abruptly, without 'connecting the dots' (dots being practical experiences) gathered during the practicals.

## Suggested solutions to problems

The following solutions are suggested to improve this course:

- Solving the problem that the course is too short (solution depends on S3 design):
  - Integrate the course into Research Methodology
  - Extend the course with more practicals or theory
  - Reduce the amount of credits to 1 or 2 EC
- Add more theoretical background by using a *book (some chapters) or a set of papers*. Also useful for those who want to dive deeper or can't attend the course due to electives.
- An *introductory session* (possibly together with other courses) to sketch the background of the course, its relevance for future study and work and its place among the other courses in the semester.
- Clear communication on the exact goals of the practicals, to guide the students in their way of thinking about the assignment.
- Organize an *in-depth, final discussion* on the comparison between social and natural science experiments and measurement/conclusion challenges. Such a discussion could have been a valuable wrap-up of the course and could have added the missing theoretical component.

## Agreements

The following agreements (which apply to semester 3 2017) have been made with the course teacher (Fokko Jan):

- Fokko Jan will *change the length of the course* (see the suggestions beneath the first bullet point above)
- Fokko Jan will add a theoretical component to the course, by *finding suitable literature* and *organizing a wrap-up discussion* or something with a similar purpose.
- Fokko Jan will organize a *course introduction*, as suggested at the third bullet point above.
- (Not specifically related to this course) The EduCo '18 will devise a plan to increase *student involvement* during plenary class sessions.

## Research Methodology I (Model Based Reasoning)

created by: Tim Roelofs

e-mail: t.j.t.roelofs@student.utwente.nl

year/semester: Semester 3, 2016, class of 2018

teacher: Mieke Boon (assistants Koray Karaca and Miles MacLeod)

### Summary of the course

The course RM I: MBR was taught by Mieke Boon, who was assisted by Koray Karaca and Miles Macleod. This is the first time this course was taught in ATLAS. The course was meant to support the learning of skills in research and interdisciplinarity by teaching model-based reasoning as a skill (including the B&K tool). According to Mieke, it is a completely new course that exists nowhere else in the world.

The course consists of nine lectures, of which all but one took place in the first quartile. This course was very closely integrated with the project and students had to apply MBR in their projects. Seven evidence possibilities were presented on Blackboard, mainly on applying the MBR approach (using the B&K tool).

More information on the course can be found in its [course book](#).

### EduCo criteria

For this course, the EduCo semester survey was conducted twice. Since the majority of the course's lectures were given in Q1, the survey was initially sent out after this quartile. The results from this survey were discussed with Mieke and several agreements were made for the rest of the semester and next year. As the course only officially ended at the end of the semester, and as the EduCo semester survey was changed slightly during the semester (as described earlier in this document) it was decided that the survey would be conducted again after Q2. The results from these questionnaires can be found below.

First survey after Q1 (second and third column): (n=17, scale 1-5)

Second survey after Q2 (third and fourth column): (n=23, scale 1-5)

EduCo Criterion	Score	SD	Score	SD
1. This course sufficiently conveyed both theoretical and applied knowledge	3.3	.85	3.5	1.1
2. This course featured both group and individual work	3.5	.80	3.4	1.0
3. During this course, students were provided with a sufficient level of guidance	3.1	1.3	2.9	1.3
4. For this course, there was a variety of possibilities to prove your competence	3.6	1.1	3.9	1.2
5. This course facilitated personalization	3.1	1.2	3.1	1.2
6. This course related to the semester project and other courses	4.5	.51	4.5	.90
7. The course material was useful and relevant	-	-	3.4	1.2
8. This course allowed for an even distribution of the workload over time	3.5	.87	3.4	1.2
9. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	2.3	.85	2.0	.89
10. Feedback given by the teacher(s) was complete, useful and timely	3.3	.69	3.0	.95

11. The teacher was sufficiently available for questions/feedback about the course	3.3	1.1	3.1	1.1
12. The teacher seriously took students' feedback about the course into consideration	2.7	1.1	2.4	1.0
13. Sufficient knowledge input and support was given to reach the learning goals set for this course	3.1	.97	3.4	1.0
14. The teacher(s) taught the course in an engaging and effective way	-	-	1.8	.81
15. The format of the course was engaging and conducive to learning the course material	-	-	2.1	1.0

## Discussion

On both surveys, the course received mixed scores. Some scores were high, such as the score on criterion 4 and criterion 6, while others were quite low, such as the scores on criteria 14 and 15.

The results of the first survey were discussed with Mieke at the start of Q2 and several improvement points were discussed. Firstly, the course scored quite low on the communication criterion, as students felt like course content, evidence possibilities et cetera were not clearly or timely communicated. Secondly, students indicated that they would like to have a book or some sort of document with information for this course rather than just slides. This be useful for students that could not attend lectures (because of electives or otherwise) and for students who had rather not rely on just the slides and their memory/notes for future reference. Lastly, students felt like the lectures could be improved upon as they were perceived as lengthy and with a lot of focus on examples, and sometimes the lecturer was not able to discuss all the planned content in time.

In response to this feedback, Mieke compiled/wrote an extensive course book for MBR, of which the content includes a piece on the context of the course within ATLAS and how it relates to the learning lines, pieces on the content of each workshop, and more.

In the second survey, the score for communication (criterion 9) is still low. One of the causes of this is that the course had never been taught and was still in development during the semester, so a higher score can be expected next year, when the course will be taught for the second time. There were still a lot of last minute changes/additions which was not appreciated by students.

The last point that was discussed after the first survey (the point about improving the lectures) did not result in a concrete agreement back then. From the low scores at criteria 14 and 15 of the second survey it appears that this is still a point where improvements can be made. More interaction with students, or more tutorial-like settings rather than lecture-like settings might make the lectures more engaging.

There were also some other improvement points that were brought up by students. Firstly, multiple students thought that the separation of courses should be clearer. The project, learning lines and this course all seemed to blend together. Some students indicated that because of this, RM 1 seemed to be way bigger than they had expected – especially considering that it was a 1 EC course. This made students demotivated, as they were not prepared to spend as much time on what they thought would be a very small course.

A few students also commented on the fact that the course seemed largely based on the main teacher's (Mieke's) own research (i.e. the B&K method), which left them feeling like wondering if there were other viewpoints/theories/etc. in this field that were not discussed, or feeling like they lacked some context.

## Suggested solutions to problems

- Communication to students can be improved. The course guide was already a great help, and perhaps a (condensed) version of this could be made available as a syllabus when the course starts. At the start of the course, more information on the course activities could be given. Perhaps the EC load should be increased so that students get a more accurate expectation of the course, if the course is kept in the same format at least. A name change might be good as well: having two courses named RM1 and RM2 implies a bit of a stronger connection between the courses than there was. Also, preferably new activities should not be added during the semester so that the students have a good expectation of the course.
- The distinction between MBR, the learning lines and the project should be made clearer.
- Lectures can be given in a more interactive way. Perhaps have tutorials instead of lectures, so that students get more practical experience as well (after all, MBR is largely practical).
- Perhaps include some other methods next to B&K or give other viewpoints on MBR, so that the students have more context.

## Agreements

- A bunch of the issues were there because it was the first time the course was done. It was originally not even intended as a course but as one workshop, but it was expanded upon highly. So next year the course will be better.
- The EC load will be adjusted to be more appropriate; MBR was bigger than expected this year.
- The integration of this course and the learning lines, but as this is different from how it is done in semester 1 and 2. A clearer explanation will be given about how this works.
- Mieke improved the assignments and exercises for workshops, so that the lectures will hopefully be more attractive to students next year.
- There is no similar method comparable to B&K that Mieke can teach, which she can indicate to the class.

## Research Methodology II (Formal Methods)

created by: Leron Kok

e-mail: l.w.kok@student.utwente.nl

year/semester: Semester 3, 2016, class of 2018

teacher: Bernard Veldkamp

### Summary of the course

Research methodology II, also called formal methods, was a course given by Bernard Veldkamp and was worth 3 EC. The course focused on the methodological aspects of research in the social sciences, the learning goals can be found [here](#). The idea of the flipped classroom was used for teaching this course. Every week, the students had to prepare a certain topic, which they could do by either reading certain chapters from the book *Social research methods* (Dr. Hans J. Kolk), or by watching a couple of microlectures. The planning and format of the course was described in the [meetings outline](#) and the [planning](#). Every week from the start of the semester till the christmas holidays there was an assignment to learn about the subject matter. Students could do these assignments at home or at the class on Tuesday morning. They could also ask questions during these hours. Two weeks of the course were devoted to the social science practical of empirical evidence and at the end of the course there was a lecture about the similarities and differences between the social and the natural sciences. Evidence for the course was provided by a test given after the christmas holidays and/or by an optional assignment about SPSS.

### EduCo criteria

(n=22), scale: 1-5

EduCo criterion	mean	SD
1. This course sufficiently conveyed both theoretical and applied knowledge	3.4	0.8
2. This course featured both group and individual work	2.4	1.0
3. During this course, students were provided with a sufficient level of guidance	3.5	0.9
4. For this course, there was a variety of possibilities to prove your competence	2.3	0.9
5. This course facilitated personalization	2.1	0.9
6. This course related to the semester project and other courses	3.8	0.7
7. The course material was useful and relevant	4.1	0.8
8. This course allowed for an even distribution of the workload over time	4.3	0.7
9. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	3.8	1.0
10. Feedback given by the teacher(s) was complete, useful and timely	2.8	0.8
11. The teacher was sufficiently available for questions/feedback about the course	4.2	0.6
12. The teacher seriously took students' feedback about the course into consideration	3.8	0.8

13. Sufficient knowledge input and support was given to reach the learning goals set for this course	3.8	0.9
14. The teacher(s) taught the course in an engaging and effective way	2.5	0.9
15. The format of the course was engaging and conducive to learning the course material	2.6	1.0

## Discussion

In general, students liked the the knowledge provided in this course and also saw the relevance of this knowledge. Furthermore, during the feedback sessions that were held during the semester, the students indicated that they liked the idea of the flipped classroom. However, the topics dealt with as well as the assignments were not very difficult or challenging, which caused that most students did not see the added value of going to the class. This is reflected by a low score on criteria 14 and 15.

Another issue of this course was that initially, the test at the end of the course was the only option for evidence. Apart from the fact that a normal test is not really the ATLAS way of assessment, one option is limited to prove one's competences. This issue was partially resolved by an extra assignment that would count as evidence, but this was still limited, also because this assignment was only available on request from the teacher. This can be seen from the low scores on criteria 2,4 and 5. On the test itself, only a grade was given without additional feedback, which caused a low score on criteria 10. According to Bernard, the planning of the test at the end of the semester caused that he did not have much time to check the tests and provide feedback on them. Next time, he hopes to plan the test earlier, so that he has more time to provide feedback.

A final issue was that some important announcements on blackboard were not sent via e-mail to the students, which caused that these announcements were sometimes missed. Bernard has said that he was not aware of this, as blackboard blackboard itself showed that the announcements were sent through email.

## Suggested solutions to problems

The following solutions are suggested to improve this course:

- The course could be given in one quartile, which leaves more room for application of the knowledge or deepening of the knowledge in the second quartile
- Make the assignments provided during the course more difficult/challenging, such that going to the class has added value. These assignments could try to foster teamwork, to integrate the knowledge from different sessions or to provide a practical aspect for the course.
- Offer more evidence possibilities for the students during the course, and make those available for everyone on blackboard. This way, students can better improve themselves during the course. A description of these evidence possibilities should be put on blackboard before the start of the semester, so that students can incorporate those in their PDP.
- The test results of the final test should be more elaborated by providing feedback on the open questions, and by giving students more time to look at their test results and reflect on those (now it was only possible two days before the SER deadline).
- Important announcements should be sent through blackboard as well as via mail.

## Agreements

The following agreements (which apply to semester 3 2017) have been made with the course teacher (Bernard):

- In the semester 3 team, Bernard will suggest to teach the RM II course as it was given this semester in one quartile with the test at the end of the quartile. This way, the course will be more condensed and it gives Bernard more time to provide feedback on the tests.
- Bernard will accommodate assignments that can be discussed during the classes which will be more challenging ATLAS-like.
- Bernard will suggest a structure change of RM II, which, if accepted, will leave more room for personalization next year.
- Assignments that can be used for evidence will be put on blackboard such that those are available for everyone.

## Social Science Seminars

created by: Frank Kwakkelaar

e-mail: f.kwakkelaar@student.utwente.nl

year/semester: Semester 3, 2016, class of 2018

teacher: Klaasjan Visscher, Bernard Veldkamp

### Summary of the course

Social Science Seminars (SSS) was a 2 EC course connected to Research Methodology II, and comprised of five seminars spread over 10 weeks. Guests were invited to give these seminars, which were to focus on the research methodology aspect of their research. Prior to each seminar, preparation material, typically reading or answering some questions, were posted on blackboard. The seminars gave a perspective on different types of research and their methods and insight. At the end of the course, a methodological review (max 3500) words was due, where two or three seminars were to be critically analyzed and compared.

### EduCo criteria

(n=22, scale 1-5\*)

<b>EduCo criterion</b>	<b>mean</b>	<b>SD</b>
1. This course sufficiently conveyed both theoretical and applied knowledge	2.8	1.5
2. This course featured both group and individual work	2.7	1.7
3. During this course, students were provided with a sufficient level of guidance	2.2	1.1
4. For this course, there was a variety of possibilities to prove your competence	1.7	1.0
5. This course facilitated personalization	2.8	1.7
6. This course related to the semester project and other courses	3.5	1.2
7. The course material was useful and relevant	3.0	1.5
8. This course allowed for an even distribution of the workload over time	3.0	1.4
9. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	3.5	1.7
10. Feedback given by the teacher(s) was complete, useful and timely	3.9	1.1
11. The teacher was sufficiently available for questions/feedback about the course	2.6	1.3
12. The teacher seriously took students' feedback about the course into consideration	2.9	1.0
13. Sufficient knowledge input and support was given to reach the learning goals set for this course	3.0	1.2
14. The teacher(s) taught the course in an engaging and effective way	2.7	1.6
15. The format of the course was engaging and conducive to learning the course material	2.5	1.9

## Discussion

Due to the setup of the course as a collection of lectures akin to “inspiring lectures” with a more specific focus, most of the results from the survey were hard to evaluate and not relevant. For instance, no teacher taught the course, and there was no course material in the traditional sense. However, this course was designed in connection to RMII, and therefore, would ideally be evaluated together with RMII as a package. However, students were not aware of this and saw SSS as its own course, and the EduCo did the same. Therefore, SSS has its own section in this semester documentation.

Given the format of the course, some survey questions were not relevant, and therefore the results are not meaningful. For instance, criterion 11 and 2. However, some insights are to be derived. Feedback for the assignment was very timely, leading to a very high score (3.9 for criterion 10). The focus on different types of research was very relevant to the semester and project (3.5 for criterion 6), and the course was generally well communicated (3.5 for criterion 9).

However, student feedback reflected that seminars were not always focused on research methodology, but sometimes focused solely on the research insight itself. There was also a lack of introduction to the course. Some negative feedback from the course make sense in the perspective that SSS was not designed as its own course but as a compliment to RMII, which is why it only had one assignment. For instance, the most common feedback was that there was only one evidence possibility (1.7 for criterion 4). Since it was not a course taught by a teacher, but rather a set of talks, there was also no central guidance (2.2 for criterion 3).

## Suggested solutions to problems

The following solutions are suggested to improve this course:

- Integrate RMII and SSS
- Instruct guests more clearly on the goal of the seminar

## Agreements

The following agreements (which apply to semester 3 2017) have been made with the course teacher (Bernard and Klaasjan):

- SSS will no longer be stated as a course, but as part of RMII. Klaasjan and Bernard will bring to the table the idea of integrating RMI, RMII, and EE into one integrated research course going through the entire empirical cycle for the next semester 3 team.
- Speakers will be more clearly informed on the intended purpose of their seminar

## Systems, Signals and Transformations (SST)

created by: Stef Koenis

e-mail: s.p.j.koenis@student.utwente.nl

year/semester: Semester 3, 2016/2017, class of 2018

teacher: Martin Streng

### Summary of the course

The course took 9 weeks, was worth 3 ECs and consisted of two parts. The first part was rather structured and Martin gave some presentations about: the sampling theorem, mathematical basis of Fourier expansions, and how to perform a fft with MATLAB and draw conclusions from it. The deliverable for the first part was a report about an assignment (consisting of multiple parts) about Fourier expansions (with MATLAB).

The second part of the course consisted of a project for which you had 5 weeks to complete. In week 4, people could form groups of 2-5 people and pick a topic from [this list](#), ranging from Fourier and Laplace transformations to game theory. Every week, groups had the opportunity to schedule a 1-hour consult with Martin on Monday or Friday. In week 9, all groups had to give a presentation about their project (approximately 6 minutes per group member). Martin determined with a die who had to present which part.

Next to all this, students had to perform an ECG practical in week 8 in which they also had to apply Fourier expansions. ECG was part of the Empirical Evidence course but the report was also considered a deliverable for SST. The last deliverable of this course was a reflection on the course (not more than 1 A4). A more extensive account of the course's structure and learning goals can be found in [this presentation](#).

### EduCo criteria

(n=12, scale: 1-5)

<b>EduCo criterion</b>	<b>mean</b>	<b>SD</b>
1. When possible, this course conveys both theoretical and applicable knowledge	3.9	1.4
2. This course features both group and individual work	4.6	0.7
3. During the course, students are provided with a sufficient level of guidance	4.0	1.2
4. For this course, there is a variety of possibilities to prove your competence	3.1	1.2
5. This course facilitates personalisation	3.9	1.2
6. This course relates to the semester project and the other courses	2.9	1.1
7. This course allows for an even distribution of the workload over time	4.1	0.5
8. The communication about learning goals, schedule, deadlines and possibilities for evidence is clear.	4.6	0.5
9. Feedback given by the teacher(s) is complete, useful and timely	4.7	0.5
10. The teacher is sufficiently available for questions/feedback about the course	4.4	0.7
11. The teacher seriously takes students' feedback about the course into consideration	4.6	0.7

12. Sufficient knowledge input and support is given to reach the learning goals set for this course	4.1	0.8
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## Discussion

In general, students really liked the course and the way it was structured. Some students suggested a similar structure for other maths courses. Quite a few people wondered whether the course went ‘deep enough’ when they compared it to the 2015 SST course given by Yorick. In that course, everyone had to go over Fourier and Laplace transformations and there was a larger focus on *systems*. To this, Martin replied that 2016’s SST course was only 3 ECs and that going that deep into transformations is not relevant for everyone (especially not for people that do not want to do anything technical). Instead, he decided to focus more on mathematical modelling. People that still wanted to focus on transformation could do so in the project in the second part of the course. The drawback of this for them was that they did not practise with mathematical modelling. For some people, it was difficult to choose between [the projects](#) because they did not fully understand what the topics were and looking back, some people regret not going into transformations. To make up for this, there will probably be a course about transformations in semester 4.

SST was Martin’s first course to give in ATLAS and hence there were some ambiguities (also for himself) as how to hand in assignments (through email or portfolio?) and how SST related to the other courses and the semester project. This explains the relatively low score (2.9) on criterion 6. It was for example not clear if the ECG practical belonged to the EE or SST course. Unfortunately, not everyone could attend the lectures due to electives they were taking, this was a problem with more ATLAS courses in semester 3 though. There was a session in which Martin explained the assignments of the first part and the feedback that he had given. This session was very useful for students but only a few students attended because it was not clearly announced (there was no separate schedule).

## Suggested solutions to problems

The following solutions are suggested to improve this course:

- Give the course a more descriptive name so that there is less confusion about the content.
- Have a proper book for the first part of the course (e.g. about Fourier expansions with MATLAB) so that students can prepare themselves for the lectures. A book will also be helpful for students who cannot attend the lecture due to their elective.
- Try to figure out a schedule for SST so that more people will be able to come to the lectures and tutorials (less overlap with electives).
- Have a greater focus on mathematical modelling (for everyone) to make the connection to MBR and the semester project.
- Clearly coordinate with the EE course what belongs to EE and what to SST (EC-wise), now it seemed as if the ECG practical was counted twice.

## Agreements

The following agreements (which apply to semester 3 2017) have been made with the course teacher (Martin Streng):

- Martin will put the slides of lectures on blackboard before the lectures.
- Martin will make a clear schedule (a separate document) at the start of the course. This will also include the session in which you can ask questions about the feedback you got on the assignments .
- Martin will clearly communicate what the procedure for handing in assignments is.
- Martin will make sure there are enough slots on portfolio to hand in your evidence (including feedback) for SST.

- Martin will provide a more elaborate explanation of the topics for the second project so that students can make a well-considered decision what to focus on.

## Algorithms & Programming (A&P)

created by: Stef Koenis

e-mail: s.p.j.koenis@student.utwente.nl

year/semester: Semester 3, 2016, class of 2018

teacher: Ruud van Damme (and Rik Mulder, Martijn Atema and Ollie Ford)

### Summary of the course

The A&P course (3 EC) was eventually divided up in six normal sessions and one wrap-up session (approximately seven weeks in total). For every session, students had to read part of a book on algorithms by Goodrich, and make exercises that were in [the course reader](#). These exercises (usually one or two per topic plus a reflection) had to be handed in on Sunday one week *after* the session (so not in the same week) on an online ‘programming hub’ (atlas.ninja). Students were supposed to get feedback on their work through this hub.

On Monday there was usually something like a lecture and on Friday there was a time slot scheduled to ask questions. The last of the six sessions was dedicated to the mini-projects. Students could do one or more mini-projects by themselves or with a partner. There were about 8 mini-projects in [the course reader](#) that they could choose from.

### EduCo criteria

(n=24, scale 1-5\*)

EduCo criterion	mean	SD
1. This course sufficiently conveyed both theoretical and applied knowledge	3.9	1.0
2. This course featured both group and individual work	3.4	1.0
3. During this course, students were provided with a sufficient level of guidance	2.7	0.9
4. For this course, there was a variety of possibilities to prove your competence	3.7	1.2
5. This course facilitated personalization	3.9	1.0
6. This course related to the semester project and other courses	2.4	1.1
7. The course material was useful and relevant	3.8	1.1
8. This course allowed for an even distribution of the workload over time	3.5	1.2
9. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	2.9	1.0
10. Feedback given by the teacher(s) was complete, useful and timely	1.4	0.7
11. The teacher was sufficiently available for questions/feedback about the course	2.5	1.1
12. The teacher seriously took students' feedback about the course into consideration	3.2	1.0
13. Sufficient knowledge input and support was given to reach the learning goals set for this course	3.2	1.0

14. The teacher(s) taught the course in an engaging and effective way	2.6	0.9
15. The format of the course was engaging and conducive to learning the course material	3.3	1.1

## Discussion

We had a wrap-up feedback session with Rik, Martijn and Ollie - the student assistants of the A&P course - instead of with Ruud because he was ill. Something that was really good about this course was the fact that it could readily be personalised (3.9 on criterion 5). Furthermore, students liked the type of exercises in the course reader which were very ATLAS-like, differed in difficulty and also allowed for personalisation.

Students were not very content with the organisation of this course; this is reflected by the low scores on criteria 3, 9, 10 and 11. Ruud was absent for almost half of the course's contact hours and this was not always communicated very well.

The course information was badly structured: there were two syllabus-like documents that had a lot of overlap but neither contained clear learning goals for the course. The course started off really late in the semester and therefore had to be squeezed in six sessions. Unfortunately, some content (e.g. data structures, basics of search algorithms) had to be scrapped for that reason. The distinction between A&P and AI was often vague and would need to be reconsidered next year.

According to most students, the lectures were not engaging nor interactive and seemed ill-prepared (criteria 14 and 15). Students would have liked the lectures to be more about the basics of algorithms (providing some context to the things they read in Goodrich).

Unfortunately, students did not always receive feedback on their work (see criterion 10). Hence, it was difficult for them to know how they should improve. When writing the SER, most students had only received feedback on a small part of their work.

## Suggested solutions to problems

During the wrap-up feedback session with Rik, Martijn and Ollie, we came to the conclusion that the course could already be improved a lot if it is given by a teacher who has sufficient time to prepare the sessions. Well-prepared workshops are likely to be more engaging and interactive. It was mentioned that the Python course was a lot better than the A&P because the workshops were well prepared. Although there are of course important differences between the Python and A&P course, the Python course could be used as an example. Other suggestions for improvement are:

- Indicate the difficulty of each exercise in the reader so that students can make an informed decision on which exercises they will do.
- Put the deadline for the exercises belonging to a particular session in the same week (on Sunday). Now, the deadline was one week later and hence, people were systematically lagging behind.
- Put solutions to all exercises belonging to a particular session online (after the deadline of course) in a readable format. Now only a couple of solutions were put online in hard-to-decipher handwriting.
- Start the course earlier in the semester so that there is more time to cover all the necessary topics and students have more time to actually work on it. This was now difficult because the last weeks of the semester were really busy with project-related activities.
- Record the lectures and put them online so that students who cannot attend (due to their electives) can also watch the lectures.
- Make clear what students should do in order to receive feedback. Now it was not clear if you had to hand in a reflection on your work every session.

- As we found out during the wrap-up session: feedback given during this course would mainly concern the algorithmic aspects of the assignments and not so much the programming part (this is the focus of the Python course). This should be made clear to students because now many of them expected elaborate feedback on the programming part as well.

## Agreements

Because the A&P course will be radically different next year and the teacher himself was not there, we were not able to make any real agreements.

## Artificial Intelligence (AI)

created by: Stef Koenis

e-mail: s.p.j.koenis@student.utwente.nl

year/semester: Semester 3, 2016, class of 2018

teacher: Ruud van Damme (and Rik Mulder, Martijn Atema and Ollie Ford)

### Summary of the course

The Artificial Intelligence (AI) course was an elective offered by ATLAS worth 3 ECs. The course started on November 14<sup>th</sup> and was eight weeks in length. As described in the [study guide](#), the AI course was aimed at being able to apply various complicated algorithms and explain their properties and differences. It built on A&P, using the gathered algorithm-application skills to compare various algorithms and come up with new code structures. The course was open in the sense that it did not include fixed lectures or intermediate deadlines. The students had to complete at least two final assignments, in which they had to apply algorithms to big projects (such as coding a calcudoku solver). Information needed to complete these projects could be gathered from detailed problem descriptions, recommended books and of course the teacher and the student assistants.

As the syllabus describes, the idea was to have all students create a description of their work (problem + solution) that could be added to a large 'ATLAS AI Book'. This book could then be used and built upon by students from following years. Students that handed in their work before the 1<sup>st</sup> of January 2017 participated in a 'contest', in which they tested which algorithm was fastest. The second deadline was on the 12<sup>th</sup> of January.

### EduCo criteria

(n=24, scale 1-5\*)

EduCo criterion	mean	SD
1. This course sufficiently conveyed both theoretical and applied knowledge	4.2	0.5
2. This course featured both group and individual work	2.6	1.2
3. During this course, students were provided with a sufficient level of guidance	2.9	0.7
4. For this course, there was a variety of possibilities to prove your competence	3.4	1.1
5. This course facilitated personalization	4.1	0.7
6. This course related to the semester project and other courses	2.4	0.7
7. The course material was useful and relevant	4.1	0.7
8. This course allowed for an even distribution of the workload over time	3.5	1.4
9. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	2.8	1.0
10. Feedback given by the teacher(s) was complete, useful and timely	1.6	0.9
11. The teacher was sufficiently available for questions/feedback about the course	3.4	0.5
12. The teacher seriously took students' feedback about the course into consideration	3.5	0.6

13. Sufficient knowledge input and support was given to reach the learning goals set for this course	3.0	0.8
14. The teacher(s) taught the course in an engaging and effective way	3.3	0.9
15. The format of the course was engaging and conducive to learning the course material	3.4	0.7

## Discussion

We had a wrap-up feedback session with Rik, Martijn and Ollie - the student assistants of the AI course - instead of with Ruud because he was ill.

In general, we got the feeling that people liked the AI course. There was not much guidance and some students complained about this (criterion 3). However, it was clear from the beginning that there would not be much organised guidance. Most students appreciated the assignments, found them challenging, and learnt a lot by doing them.

As with A&P the course information was not very clear nor easily found (criterion 9) and what was required from students to pass the course kept changing. For example: first students had to do *all four* assignments and later only two. Also, when some students chose to do this course, their expectations were quite different from what the course ultimately turned out to be: the course did not explain AI in a general manner (e.g. what types of algorithms exist) and the course seemed to only be about the programming part of AI, the other dimensions (societal, ethical) did not get any attention. The description on blackboard did make it seem like these other aspects would be part of the course.

Another recurring remark was the vague relation between A&P and AI. Some students and also the student assistant commented that AI should be better integrated with A&P. An example mentioned in the wrap-up session: the basics of search algorithms could have been part of A&P and the assignment about search algorithms (A\*) could then build on this in the AI course. From the student assistants we understood that the whole programming curriculum in ATLAS will be different from now on (Python in S1, A&P in S2 and AI as an elective in S3). Hopefully this opportunity will be used to align these courses in a logical way.

A large problem with this course was that students barely received any feedback on their assignments (criterion 10). In their SER they therefore had to trust their own judgement on how well they did in the course. This problem can be ascribed to the unavailability of the teacher, which also caused the idea of the 'ATLAS AI Book' to eventually fade out: To our knowledge at the time of writing, an 'ATLAS AI Book' has not been written yet.

## Suggested solutions to problems

The following solutions are suggested to improve this course:

- Include a general introduction to AI in the course (with assignments). Make having general knowledge about AI a learning goal so that the course better meets the students' expectations. Another possibility: stick to the content of the course as it was now but change the description so that it better reflects the course content.
- Make it possible to focus on the ethical/societal aspects of AI. Evidence for this could consist of reading articles and writing essays instead of only writing programmes. This 'track' of the course could be organised together with a social science ATLAS teacher.
- Organise a match day/seminar where all algorithms are tested and students can see how the different algorithms compare. On such a match day, the students that developed the algorithms could also give a presentation about them to whomever may be interested.

- (Same as for A&P): as we found out during the wrap-up session: feedback given during this course would mainly concern the algorithmic aspects of the assignments and not so much the programming part (this is the focus of the Python course). This should be made clear to students because now many of them expected elaborate feedback on the programming part as well.

## Agreements

Because the teacher (Ruud) himself was not there, we were not able to make any real agreements.

## Learning Line Interdisciplinarity

created by: Leron Kok

e-mail: l.w.kok@student.utwente.nl

year/semester: Semester 3, 2016, class of 2018

learning line coördinator: Mieke Boon

### Summary of the learning line

The responsible person for Interdisciplinarity was Mieke Boon. This learning line was taught via the course RM I (MBR) where the theory behind it was explained. The focus on this course was mainly on the B&K approach. The theory had to be applied in the project, for which an interdisciplinary research proposal had to be written. Evidence opportunities for this course were, besides the research proposal, a final (mandatory) reflection on how one had used interdisciplinarity in the project and how this was related to and supported by model based reasoning. This reflection could be used in the SER.

### Discussion

As this learning line was mostly integrated with RM I, it is difficult to discuss this learning line separately as most discussion points relate to interdisciplinarity as well as RM I. One point that became evident from the semester questionnaire is quite some students think interdisciplinarity was linked too much to model based reasoning, and that it was strange that evidence for this learning line could only be delivered via RM I.

### Suggested solutions to problems

The main problem of this learning line is that it is linked too much to RM I. Students indicated that it would help if there would be some lectures and (literature) assignments specifically about interdisciplinarity.

### Agreements

There has not been a meeting with the learning line coordinator.

## Learning Line Research

created by: Leron Kok

e-mail: l.w.kok@student.utwente.nl

year/semester: Semester 3, 2016, class of 2018

learning line coördinator: Fokko Jan Dijksterhuis & Martin van der Hoef

### Summary of the learning line

The whole semester was focused on research, and therefore the learning line was part of most courses and the project. RM II and SSS focused on research methodology in the social sciences, RM I on research in the natural sciences and EE focused on executing an experiment and data analysis. On top of that, for the project a research proposal had to be written. For the learning line specifically, there was a short lecture given by Martin van der Hoef at the beginning of the semester. As the learning line was present during the whole semester, there were no specific evidence assignments. Instead of that, competence in the learning line could be proved by reflecting on it.

### Discussion

As the learning line was very integrated in the semester, there is not much feedback about it specifically. In general, it seems that most students liked that there was a big focus on this learning line. However, some students indicated that the focus might have been too much in this semester, as basically all the courses and the project were related to it.

### Suggested solutions to problems

As there is not much specific feedback on this learning line, it is hard to identify the problems agreed upon by the most students. As some students indicated the focus on research in this semester was too much, it might be good to look into this in the design for next semester.

### Agreements

There has not been a meeting with the learning line coordinator.

## Electives

created by: Kamiel Verhelst  
e-mail: k.j.verhelst@student.utwente.nl  
year/semester: Semester 3, 2016, class of 2018  
coordinator: Jan Schut

## Background

The third semester is the first one where the majority of students takes an elective outside ATLAS. These electives had to be integrated in the semester project and had to be done in duos. Since ATLAS is a young programme, a lot of new agreements had to be set up with other programmes to allow students to follow their courses. This process was slow, since some programme directors were unwilling/unable to adapt to ATLAS students or prerequisites for courses were not met. The list of possibilities is currently extending and the goal is to 'complete' it, to make the elective process for future students easier. This will mainly be done by Jan, making arrangement with other programmes, but also by recording elective experiences of students in an Elective Database (on the Atlantis website).

## Discussion

The first three issues below have been dealt with, but are mentioned for documentation and possible further improvement.

Firstly, the fact that electives had to be done in duos and that they had to be integrated into the semester project hindered the student's choosing freedom. This has been extensively discussed within the S3-team and they will work on a solution for next S3.

Then, the communication about the student's elective preferences was chaotic during summer, because all communication was done individually via email. A similar problem occurred with the Exchange destination preferences. This was solved by setting up an online Google Spreadsheet that all students could edit and Jan could view. This turned out to work well, so it was also applied in the elective situation.

A third issue was more fundamental, and had to do with the assessment requirements of elective. It was unclear what grade students should get to pass, or what would happen when they would not pass (see the third bullet point below for a suggested solution)

The following discussion points came up near the end of the semester.

The first point is on online courses, which (when not supervised by an ATLAS teacher) usually require a payment between 50 and 100 euros. The question is whether ATLAS would want to account for these expenses, or that they prefer to use an internal supervisor. Other questions regarding online courses are whether students should be advised to follow them in the first place and how they would appear on a student's transcript.

Furthermore, the planning of the SER deadline and the date on which most students received their elective grades was unfortunate. A lot of grades came in after the deadline. This is a more general ATLAS issue, not directly related to, but relevant for this semester. It should be discussed in the Programme Committee or Curriculum Committee.

Lastly, there are ideas for an Elective Database, for which data (student experiences) is being gathered at the moment. The EduCo will coordinate the further realization of such a database.

## Suggested solutions to problems

The following solutions have either been implemented or are suggested for the next S3:

- Introduce the project goals already at the end of semester 2, so that electives can be chosen to connect to these goals (or a similar solution, by S3-team).
- Make communication about preferences more efficient by setting up online sheets that all students can fill in.
- Set up a document explaining the assessment regulations around external electives and upload this to the UCT Blackboard

- Devise a clear plan for following online courses and their presentation on the student's transcript.
- Discuss the problem of the unfortunate planning of the SER deadline and UT course grade publications (in the PC/CC)

## Agreements

The following agreements have been made with Jan Schut to improve the Electives process:

- Jan sets up (or lets the EduCo set up) an online preference sheet for Electives in the coming semesters.
- Jan talks to Ans about the payment of online courses and their mentioning on the student's transcript.
- Jan talks to Ans (or PC/CC) about the timing of assessment and elective grades (the problem of not having all grades yet before writing a SER).
- The EduCo coordinates the further realization of an Elective Database (to be published on the Members section of the Atlantis website and on the UCT BlackBoard page).

## Exchange (preparations)

created by: Kamiel Verhelst  
e-mail: k.j.verhelst@student.utwente.nl  
year/semester: Semester 3, 2016, class of 2018  
coordinator: Jan Schut

### Summary

The third and fourth semesters are used by students to decide on and apply for the Exchange in semester 5. Similar to the elective process, the list of agreements and student experiences is (and will keep) growing. The objective is to use this list effectively in the advantage of future students, and to grant all students access to these previous experiences. Challenges in guiding Exchange preparations lay in communication and the timely decision of students to choose an (especially non-EU) option.

Jan planned two sessions, one around November and another one before the Christmas break in December. These sessions were well-attended and fruitful. Students indicated that the information provided was useful and they were motivated to start/proceed in their search for a destination.

### Discussion

One of the main points, also mentioned under Electives above, is on communication (misunderstandings due to unclear emails, slow replies, etc.). However, communication issues were solved quickly. An online spreadsheet was sent out quite quickly and the UCT Study Abroad Blackboard page was updated regularly by Jan Schut, with new destination lists or previous exchange students' experiences. Also, near the end of Semester 3, a Study Abroad database was published on the Atlantis website. To ensure fluency of the Exchange process in the future, the challenge is to keep all this information up to date.

Overall, students are well-aware of the choosing and application process of Exchange destinations. There is a very nice overview document on the UCT Study Abroad Blackboard page and the information session organized by Jan Schut provided students timely with necessary information.

An irritation among students seems to be that it is unclear when lotteries for certain destinations are held and when the outcomes are published. Jan would of course not always have this knowledge himself, but he should be very direct in the communication of these dates. This would leave students who are not selected with enough time to arrange their backup destination.

### Agreements

- Jan will be responsible for keeping the list of partner universities up to date.
- Jan will communicate about the lottery and the outcome dates directly as they are available to him.
- The EduCo will be responsible for keeping the Study Abroad Database up to date.