

Annual Report Board of Studies BSc and MSc AES 1/9/2020 – 31/8/2021

Faculty CEG, Delft University of Technology

This annual report of the Board of Studies BSc and MSc Applied Earth Sciences (AES) provides an overview of the actions of the Board of Studies during the academic year 2020-2021. This review serves to inform people and bodies within Delft University of Technology concerned with the AES programmes of the status of recent and ongoing items within the AES Board of Studies. This document also gives new members of the AES Board of Studies insight into recent and ongoing items, and it supports the progress of actions in the coming year.

The AES Board of Studies is a committee that actively, and in a constructive-critical manner, works to ensure the highest quality of education in the AES programmes. The Board interacts regularly with AES teachers, students, the Board of Examiners, Education & Student Affairs, and the AES Programme Coordinator and AES Director of Studies. The Board consists of 10 members: 5-6 staff members and 5 student members. In 2020-2021 the Board consisted of:

Dr.ir. A.A. Verhagen	chair
Dr. S.R. de Roode	staff member
Dr.ir. D.S. Draganov	staff member (until June 2021)
Dr. J. Gebert	staff member
Dr. M. Soleymani Shishvan	staff member
Prof. W.R. Rossen	staff member (until September 2020)
Dr. M. Brehme	staff member (December 2020 – April 2021)
J. Hiemstra	student member
S. van der Kleij	student member
A. Ocampo Mendoza	student member
F. ter Steege	student member
A. de Boer	student member

The Board of Studies was supported by Ms E. van der Kruk (Secretary to the Board) until May 2021, and Ms S.J. Nuhn (a.i. Secretary to the Board) since May 2021. In 2020-2021, the Board had seven meetings.

The AES Board of Studies has performed its lawful roles and responsibilities:

- Provide advice on the establishment of the Teaching and Education Regulations (TER) and Annex
- Assess the implementation of the TER
- Provide advice – solicited and unsolicited – to the Dean, the Directors of Education and the Director of Studies concerning the programme and all associated teaching-related affairs.

Important items 2020-2021

1. Education quality

1.1 Educational Quality Assurance

2. BSc programme

2.1 Changes to BSc courses for 2021-2022

2.2 Python in the BSc programme

2.3 Final Attainments BSc programme

2.4 Grading Rubric Bachelor End Project

2.5 Advice on and approval of TER and Annex BSc AES 2021-2022

3. MSc programme

3.1 Changes to MSc courses for 2021-2022

3.2 MSc Redesign

3.3 Assessment Policy CEG faculty

3.4 Advice on and approval of TER and Annex MSc AES 2021-2022

4. Covid-19 measures

4.1 Influence of the Covid-19 measures on education

4.2 Influence of the Covid-19 measures on examinations

5. Study Loan Act

Elaboration on items

1. Education Quality

1.1 Educational Quality Assurance

A Brightspace page was created to share results and summaries of evaluations. The page dedicated to the CEG evaluations is maintained by Quality Assurance CEG. The summaries are not always of full Evasys evaluations, but it is still useful for monitoring educational qualities. For the BSc programmes evaluation meetings are planned before and after the educational period to discuss and evaluate the education of that period. The topic of Python was extensively discussed in the second year evaluations, and in the BoS as well, this has led to an official advice from the BoS to the Director of Studies regarding Python (see 2.2 below).

2. BSc Programme

2.1 Changes to BSc courses for 2020-2021

Four courses of the BSc programme have been changed for 2021-2022: Geology 1 and 2, Mathematics 4, Methodology of Geophysics and Remote Sensing; and Geophysical methods: Sub-surface Characterization. Some modifications were also made to one of the courses of the minor Geo-resources for the Future. The BoS has given positive advice about the changes in these courses, in most cases after asking or a few modifications to the plans.

Geology 1 (AESB1130-21) and Geology 2 (AESB1230)

Changes to Geology 1 were necessary because one of the three lecturers of the course left TU Delft, and the Covid-19 measures made it impossible to organise the mineralogy practical. It was decided to postpone the practical and incorporate it into Geology 2. Instead of an assessment for the mineralogy practical the third assessment of the course will be on the other two parts of the course, with a heavier focus on climate and sediment. This also influenced Geology 2, where the focus will be on the rock cycle. The learning objectives of Geology 1 and Geology 2 combined will remain the same.

Methodology of Geophysics and Remote Sensing (AESB1440-21)

The reports for the assignments will get the same weight, but students will only present one report (worth 10%).

Mathematics 4 (AESB2110-21)

Some changes to Mathematics 4 were necessary because the new lecturer wanted to make sure that the AES and CE courses are more similar. One change has been made: a MOOC was added to the course, including a pass/fail requirement.

Geophysical methods: Sub-surface Characterization (AESB2140-21)

For Geophysical methods a small change in the division of the grades was proposed by the lecturer, from 60-40% to 50-50%. The BoS had no objections to this change.

Geo-resources 2.0: towards the future

One of the courses of the minor Geo-resources for the future needed a new course code so that it will have two grades in Osiris in the future, one for the assignments (60% of the grade) and one for the essay (40%). The BoS had no objections to this change.

2.2 Python in the BSc programme

The BoS wrote an advice document on the implementation of Python programming skills in the BSc. It became clear from the second year evaluations and the experiences of students that there is a misalignment of the level of Python required for certain courses and the students' actual Python skills. Python is used for a stand-alone task in the first year course Grand Challenges but not in other first year courses. In the second year course Signals & Systems with Python students are expected to have Python skills at a level they don't have, and the use of Python in that course is very specifically tailored to that course, so students don't learn 'generic' coding skills. In Geophysical Methods students also have to use

Python, but many students don't really know how to and just copy old solutions without really understanding how it works.

The BoS advises that Python becomes more imbedded in the BSc programme, especially in the first year so that students will learn how to use Python before they start Signals & Systems with Python. This can be accomplished in several ways, for example by introducing a bootcamp of hackathon in Grand Challenges and by using Python for some of the labs in the second period. Lectures of first and second year courses should come together to discuss how Python is used in their courses in order to create alignment between their courses regarding the use of and skills in Python.

As a result of the BoS advice a committee of lecturers and students was set up to come up with a plan that can be implemented from September 2022 onwards.

2.3 Final Attainments BSc programme

An update of the final attainments of the BSc programme was necessary. Two educational advisors, Femke van der Wolf and Monica Breevaart, worked together with the Director of Studies to improve the final attainments. The new attainments were discussed during the meeting in November. The members gave feedback on the new final attainments, and suggestions for further improvement, either by changing the wording indicating that certain attainments were quite similar and could be combined. The feedback from the BoS was used to further improve the final attainments. In February, the BoS was given the opportunity to give another round of feedback on the final attainments. The definitive version of the final attainments is now included in the Annex of the BSc AES.

2.4 Grading Rubric Bachelor End Project

A grading rubric was created for the Bachelor End Project and the BoS members were asked to give feedback on the new rubric. They asked questions about certain elements of the rubric, for example whether 25% of the final grade for the written report is an accurate representation of the amount of work. The use of the phrase 'academic standard' also raised some questions. If such a term is used it should be clear what it means and how students can meet this standard. A good way for students to prepare for the thesis is to follow one of the university's academic writing courses. The rubric is now used for the grading of Bachelor End Project

2.5 Advice on and approval of TER and Annex BSc AES 2021-2022

The Teaching and Examination Regulations 2021-2022 were discussed in the meetings in May and June. Birgid Zaijjer, Secretary to the Board of Examiners, joined the meeting in June to answer questions about the TER. The CEG faculty has tried to follow the central model for the TER as much as possible. The TER will have another "Covid addendum", with changes in the article on the Binding Study Advice, which has been modified a bit to accommodate students in these difficult times. There were no comments on the Annex 2021-2022 for the BSc programme. Both the TER and Annex were approved by the BoS during the meeting in June.

3. MSc Programme

3.1 Changes to MSc courses for 2021-2022

Only one MSc course needed a new course code for 2021-2022, with the redesigned MSc programme starting in September 2022 lecturers decided not to change anything to the current MSc courses.

Forward and Inverse Geomodelling

A course in the Geo-Energy Engineering track, Forward and Inverse Geomodelling, required a new course code so that it would have two grades in Osiris (20% exam + 80% lab).

3.2 MSc Redesign

The MSc redesign was a regular topic on the agenda of the BoS. Many of the staff members of the BoS are involved with the redesign, but the student members are not involved, so they are in a position to give objective advice. The Director of Studies, in his role of quartermaster for the AES redesign, gave regular updates on the development of the new AES MSc programme. At the beginning of the academic year the programme core modules were almost finished, and the teams were working on the four learning lines. In February the Modelling, Uncertainty, Data for Engineers module was shared with the BoS, to give an impression of the new MSc programme. The new AES programme was discussed in April, while the Environmental Engineering programme was on the agenda in May. In both cases, the BoS was informed on the structure and content of the programme. The members could ask questions about and give feedback on the new programmes. Some concerns were discussed, such as the fact that an internship is no longer part of the new programme, and how students with a BSc AES degree can gain access to the MSc Environmental Engineering. Overall, the BoS is positive about the new programmes. The redesign will remain an important topic for 2021-2022, and once the new programmes start in September 2022 the BoS will play a role in monitoring and evaluating the new programmes.

3.3 Assessment Policy CEG Faculty

The educational advisors of the CEG faculty worked on a new assessment policy, and joined a meeting of the BoS to introduce the policy. The new MSc programmes have a different structure, where thematically coherent modules cover multiple themes and subjects. Compared to the old programmes, the new MSc programmes will have less summative assessments and assignments, with a maximum of 25 assessments in the entire programme. The educational advisors also wrote an assessment manual for lecturers to use. This manual was approved by the Educational Management Team of the faculty in October 2021.

3.4 Advice on and approval of TER and Annex MSc AES 2021-2022

The Teaching and Examination Regulations 2021-2022 were discussed in the meetings in May and June. Birgid Zaaijer, Secretary to the Board of Examiners, joined the meeting in June to answer questions about the TER. The CEG faculty has tried to follow the central model for the TER as much as possible. The TER will have another "Covid addendum", with changes in the article on the Binding Study Advice, which has been modified a bit to accommodate students in these difficult times. The BoS had some suggestions for changes to the MSc Annex, these were carried out and both the TER and Annex were approved by the BoS during the meeting in June.

4. Covid-19 measures

4.1 Influence of the Covid-19 measures on education

The Covid-19 pandemic continued to have a significant influence on education and examinations in 2020-2021. At the start of the academic year, the Covid-19 measures made it possible for the faculty to organise one day of on campus education per week, so students were able to follow some courses in person, but the remainder of the courses were taught online. A new lockdown was imposed from December 2020 onwards, and the faculty had to go back on an online education only scenario, which lasted until April.

The BoS regularly discussed the topic of online education. The student members gave feedback on how students experienced the online courses and gave suggestions for improving the online courses. When it was possible to have on campus education students mostly appreciated the opportunity to come to the campus, but also noted that it was difficult to adhere to the 1,5 meters rule and that for certain groups the on campus day was too long. This feedback was shared with the Director of Studies.

Fortunately, it was possible to organise fieldwork trips, though sometimes some changes were necessary. First year BSc students did a virtual excursion and were given the opportunity to join an excursion to the Ardennes on a voluntary basis. Second year BSc students went to France in August instead of three weeks in May/June. Fieldwork was also possible for the MSc students: Geo-Energy Engineering and Geo-Engineering students went to Spain, in June and September respectively, while Geoscience and Remote Sensing students did fieldwork in Groningen instead of Iceland.

4.2 Influence of the Covid-19 measures on examinations

All examinations in 2020-2021 were online as a result of the Covid-19 pandemic. The educational advisors of the CEG faculty advised lecturers on how to organise online exams and in some cases changes needed to be made to a course to accommodate online exams. In those cases, the Director of Studies had to give permission for the changes, and the online study guide was updated. Online proctoring was only allowed for a small number of exams, for example for the Mathematics courses. Even though it was possible to organise on campus exams, many lecturers preferred online exams and in fact almost all CEG exams were online exams in 2020-2021. For on campus exams an online alternative was always required for students who were not able to come to campus, so organising an on campus exam meant extra work for lecturers.

The topic of online examinations was discussed regularly by the BoS. One consequence of online examinations was a significant increase in reports of fraud or suspected fraud. In some cases this was due to technical issues or unintentional behaviour from the student but there were also signs that work was shared through whatsapp groups.

The student members of the BoS gave feedback on how students experienced the online examinations. They raised concerns about the impact of online exams on students, for example coping with many different types of online assessment, stress about technical issues, invasion of privacy with online proctoring. Alternatives to online examinations were discussed as well, such as assignments instead of exams, but because this would entail more work for both lecturers and students these alternatives were not always a viable option.

5. Study Loan Act

In the Study Loan Act additional funds became available to invest in the quality of education. Investments under the quality agreements should focus on at least one of the following themes:

- More intensive and small-scale education;
- More and better guidance of students;
- Study success;
- Educational differentiation;
- Appropriate and good educational facilities;
- Further professionalization of teachers (teacher quality).

The BoS is involved in the process in two ways:

1. Formally during two meetings of the BoS itself in which the Faculty requests for input upfront (this memo) and feedback on the draft proposal;
2. Informally in which the EC and FSC inform the BoS on progress of the meetings between EC/FSC and the Faculty.

The priorities and/or focal points of the BoS will be represented at the EC and FSC in the meetings with the Dean. During this academic year, the BoS made several suggestions for focal points regarding teacher support, extra teachers, student facilities, lab facilities and student psychologists. In addition, a proposal was submitted to support the development of a Digital Skills learning line, which was awarded.

Actions for 2021-2022

In 2021-2022 the AES Board of Studies will focus on:

- Quality control and evaluations;
- The Master redesign, including transitional rulings;
- The review of the TER and Annex;
- Programming (Python) in the BSc programme.