



UNIVERSITY OF ICELAND

Faculty of Civil and Environmental Engineering

SCHOOL OF ENGINEERING AND NATURAL
SCIENCES

SELF-REVIEW REPORT



June 2019





UNIVERSITY OF ICELAND

Introduction

In accordance with the Icelandic Quality Enhancement Framework at the University level in Iceland and the University of Iceland's Guidelines for the organization, schedule and process of an institution-led review of faculties and interdisciplinary programmes, the Faculty of Civil and Environmental Engineering (the Faculty), School of Engineering and Natural Sciences (the School), University of Iceland (the University), carried out a self-evaluation during the spring semester of 2019. The results are presented in this report. A Self-evaluation Committee was established in January 2019 and meetings were held during the spring semester of 2019.

The Committee members were:

1. Bing Wu, Assistant Professor
2. Bjarni Bessason, Professor
3. Gudmundur F. Ulfarsson, Professor, Head of Faculty, Committee Chair
4. Guðný Benediktsdóttir, School Quality Director
5. Helga Jóhanna Bjarnadóttir, Industry Representative
6. Hrund Ó. Andradóttir, Professor, Environmental Engineering Programme Chair
7. Kolbrún Fríða Hrafnkelsdóttir, B.S. Student Representative
8. Majid Eskafi, Ph.D. Student Representative
9. Rajesh Rupakhety, Professor, Vice Head of Faculty, Civil Engineering Programme Chair
10. Sigurjón Gauti Sigurjónsson, M.S. Student Representative

The Committee used results of the data collection from University databases, student satisfaction results and focus groups' results, along with its own discussion and ideas to develop actions for improvement. The University of Iceland Centre for Teaching and Learning reviewed the Faculty's course catalogue descriptions, especially learning outcomes, and provided the Committee with that review.

The external industry representative attended Committee meetings, including during the visit of the international external experts. The industry representative provided comments that have been incorporated into the report.

This material was reviewed by the international experts who visited the School on March 19-22, 2019, and met with the Committee members. These were Polat Gülkan, Professor Emeritus of Civil Engineering at Middle East Technical University (Turkey), Rajeev Bansal, Professor of Electrical Engineering at University of Connecticut (USA) and Aletta Nylén, Assistant Professor in Computer Science at Uppsala University (Sweden). The international expert reviews were used to refine and finalize the resulting recommendations represented in this report.

Faculty Characteristics

The Faculty of Civil and Environmental Engineering is the only Faculty which offers Civil and Environmental Engineering at the B.S. and Ph.D. levels in Iceland, and the only Faculty offering Environmental Engineering at the M.S. level. Elsewhere there is a limited M.S. programme in Civil Engineering only. Hence, the function of the Faculty in educating and carrying out research is important for Iceland. This includes fields such as air quality, earthquake engineering, engineering design, environmental engineering, geotechnical engineering, renewable energy (hydropower), structural engineering, transportation engineering, urban planning, sustainability, water and hydraulics. The Faculty has strong and active connections with industry and institutes operating in the Civil and Environmental Engineering field.

The administration of the Faculty is governed by the Faculty Meeting which is run in accordance with articles 17 and 18 of Regulation 569/2009. Daily administration is in the hands of the Faculty Head, with assistance from the Vice Head as needed, as stipulated in article 16 of Regulation 569/2009. Two Faculty members are tasked with the duties of Programme Chairs for Civil Engineering and Environmental Engineering, respectively. The Faculty offers six study programmes at the undergraduate and graduate levels (Appendix 1, Table 1).

The Faculty currently has 11 academic teaching positions (8.48 full time equivalent, FTE) (Appendix 1, Table 2) in the main fields of Civil and Environmental Engineering. The Faculty includes two female Faculty members and 7 of the 22 sessional teachers are female. The gender imbalance is something the Faculty is working to change through new hires in accordance with the Equal Rights Law of Iceland and the gender equality policy of the University. In addition, the Faculty includes two research scientists (both male) and five sessional adjuncts (two females and three males). All full-time Faculty members have doctoral degrees but not all sessional adjuncts and teachers; however, they are all chosen due to expertise and specialization in their respective fields.

The number of students and their progress through the B.S. programme (UOB261) is viewed as satisfactory by the Faculty with about a hundred students in the programme and with about 20 graduates each year. There is about a 78% 4-year completion rate. (Appendix 1, Table 3). The M.S. programmes (BYG441 and UMV441) have seen a reduction in the number of students and entrants, which poses difficulties for offering a full set of courses for these programmes. The doctoral programmes (BYG561, UMV561, UMV564) are healthy. A negative point is that there are too many students who take more than 5 years to complete their doctoral degrees. In 2017-2018 the number of students was 161, thereof 107 undergraduate students, 39 master students, and 15 PhD students.

Summary and Main Conclusions for the Faculty

Lessons learned from QEF1

The University has made a great effort in investigating student retention rates and the School has used this information to emphasize the reception of new undergraduate students.

The Faculty completed a learning outcome matrix evaluation of the B.S. programme in 2018 but has not yet completed this for the M.S. and Ph.D. programmes.

It remains a challenge to better balance civil and environmental engineering aspects in the programmes and the Faculty has identified further actions in that direction in this review. The Faculty was able to hire a new assistant professor of environmental engineering which has led to new course offerings in Environmental Engineering at the B.S., M.S., and Ph.D. levels. Hence the environmental engineering aspects of the programme have been strengthened.

The Faculty developed formal and written recruitment goals in 2015 and finalized a recruitment plan in 2018. The Faculty formalized a research strategy in 2015. The School has expanded and updated group work facilities. The Faculty has entered into contracts with two companies and one institute to formalize teaching, and furthermore has agreed to 5 adjunct contracts with individuals to formalize sessional teaching in the long term.

Teaching and Learning

The Faculty has had a strong framework of quality review of its programmes for a number of years and conducts a continuous review and improvement cycle. The Faculty has set a teaching strategy and measurable goals in a scorecard, which it tracks annually. The Faculty receives and reviews annually surveys of B.S., M.S., Ph.D., and graduated students. The Faculty annually reviews the course evaluations at a Faculty Meeting and with student representatives.

The Faculty has set learning outcomes for all its courses and for its degree programmes. The Faculty reviews these and revises them regularly, and most recently revised the B.S. learning outcomes in 2015. The Faculty will revise the M.S. outcomes next, followed by the Ph.D. learning outcomes. The Faculty sees sustainability as a common thread for its programmes and intends to express this more strongly in its policy and its course learning outcomes.

The Faculty reviews how the course learning outcomes map to the programme learning outcomes regularly and has completed this for the B.S. programme during this past review cycle and intends to complete these for the M.S. and Ph.D. programmes in the upcoming cycle.

The Faculty intends to strengthen the welcoming and orientation of new graduate students and improve support for international students. The community of graduate students needs to be strengthened. The Faculty intends to involve graduate students more in the Faculty, both in Faculty Meetings and in participation at events, such as recruitment events. The Faculty has set several actions to further these goals.

The Faculty reviews M.S. study plans formally at a Faculty Meeting. The Faculty now plans to strengthen the basis of M.S. students in their speciality along with strengthening the

community of M.S. students by defining core courses in the programmes. It is also thought that this will streamline the M.S. programmes. The Faculty is also working with the School to offer more specialized courses in the graduate programmes. The Faculty will work to better highlight the Faculty's research strengths in the graduate programmes to strengthen the ties between teaching and research and to improve graduate student recruitment.

The Faculty has set written rules for doctoral evaluation and monitors doctoral programmes with a Faculty Graduate Studies Committee. These rules will be revised and updated as necessary in the upcoming review cycle.

Management of Research

The Faculty has set a research strategy and defined research emphasis areas, where the Faculty has and intends to maintain a research specialty and strength. The Faculty has developed a five-year recruitment plan for new Faculty members based on this strategy.

In terms of research output (Appendix 1, Table 4), as measured by the evaluation system of the public universities in Iceland, the Faculty has remained steadily productive, exceeding both the School and University averages by a good margin. This has been in large part the result of the success of the Faculty's doctoral programme.

The Faculty has developed measures of research, which are tracked annually in a scorecard, to monitor progress towards goals and to measure the impact of the Faculty's research on those dimensions (publications, research in the University evaluation system, graduated M.S. students, doctoral students and graduated Ph.Ds., post docs employed). The Faculty notes that the impact on society needs to be better tracked and is working to improve that aspect. Also, the Faculty will work with the School to develop measures of external support.

The Faculty presently reviews the strategy and scorecard annually at a Faculty Meeting and intends to continue to do so.

Follow-up Processes

The implementation of the Action Plan will be a standing item at Faculty Meetings. It will be reviewed formally every year at a Faculty Meeting and the upcoming year's actions prioritized and adjusted based on experience.

The Faculty Head reports formally to the School Dean on the status of the implementation and plans for the next year, together with other relevant QA matters no later than December 1st and this will be followed up by the School Board. The School Dean will subsequently make use of this report in a status report for all Faculties in the School, which will be submitted to the Quality Committee no later than January 15th. The Quality Committee writes a short report to the Rector no later than February 1st, which will subsequently be discussed in a meeting between the Chair of the Quality Committee, the Director of Quality Management and Rector, Vice-Rectors, Deans of Schools and the Managing Director of the Central Administration.

Appendix 1. Key Figures.

Table 1. Overview of present Study Programmes within the Faculty

Name of Study Programme	Cycle ¹	Degree	Credits (ECTS)
UOB261 Civil and Environmental Engineering	1.2	B.S.	180
BYG441 Civil Engineering	2.2	M.S.	120
UMV441 Environmental Engineering	2.2	M.S.	120
BYG561 Civil Engineering	3	Ph.D.	210
UMV561 Environmental Engineering	3	Ph.D.	210
UMV564 Environmental Studies	3	Ph.D.	180

¹ See National Qualification Framework for Higher Education No. 530/2011.

Table 2. Faculty members as of 1 September 2018 and sessional teachers 2017, number (No.) and full time-equivalent (FTE).

	Male		Female		Total	
	No.	FTE	No.	FTE	No.	FTE
Professors	5	5.00	1	1.00	6	6.00
Associate Professors	3	1.24			3	1.24
Assistant Professors			1	1.00	1	1.00
Adjunct Lecturers	1	0.24			1	0.24
Total	9	6.48	2	2.00	11	8.48
Sessional teachers	15	1.96	7	0.58	22	4.46

Table 3. Total number of students, number of entrants, retention rate for first year, and completion rate (4-year mean).

Programme	No. of students			No. of entrants ³	Retention rate	No. of graduates	Completion rate ⁴
	Total no.	Full time ¹	Part time ²				
UOB261	94	64	21	32	55	20	78
BYG441	20	9	6	5	55	9	68
UMV441	12	5	4	3	40	5	71
BYG561	5.3	4.0	-	1	-	0.8	25
UMV561	1.3	0.5	-	0	-	0.3	0
UMV564	4.0	3.8	-	1.3	-	0.8	100

¹ > 22.5 ECTS completed. For Ph.D. students > 1 ECTS completed.

² 1-22 ECTS completed.

³ For all programmes except Ph.D., no. of students completing at least one examination in first term.

⁴ 2-year rate for diploma, 4-year rate for B.A./B.S., 3-year rate for M.A./M.S., 5-year rate for Ph.D.

Table 4. Research output of Faculty members, based on the Evaluation System for the Public Universities in Iceland, expressed by mean total research points (A) and mean research points from peer-reviewed publications only (B) per FTE.

	2014		2015		2016		2017		Mean	
	A	B	A	B	A	B	A	B	A	B
Faculty	54.6	39.4	42.1	28.7	51.9	32.4	62.0	42.4	52.7	35.7
School	41.8	31.6	43.4	32.4	39.0	29.7	39.1	27.5	40.8	30.3
University	31.7	24.1	37.8	24.7	37.1	25.1	34.8	22.8	35.4	24.2

Appendix 2. Action Plan for Teaching and Learning and Management of Research in QEF2

	Actions	How	Deadlines	Responsible party
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1. FACULTY LEVEL

Ch. 1.2	Faculty Characteristics			
1	Recruit new Faculty members	Seek approval for recruiting Assistant Professor of Civil Engineering and start recruitment if permitted	Sept. 2019	Head
2	Recruit new Faculty members	Seek approval for recruiting Assistant Professor of Environmental Engineering and start recruitment if permitted	Sept. 2020	Head
3	Recruit new Faculty members	Seek approval for recruiting Assistant Professor of Civil Engineering and start recruitment if permitted	Sept. 2021	Head
Ch. 1.3	Academic Vision			
1	Highlight sustainability better in Faculty policy	Update Faculty policy to better incorporate sustainability as a key component of the Faculty vision	Dec. 2020	Head, Programme chairs, Faculty meeting
2	Improve the teaching policy regarding graduate studies and connection with industry and other faculties	Develop new graduate studies strategy items and add them to the present Faculty policy	Dec. 2020	Head, Programme chairs, Faculty meeting
3	Measure societal impact of research	Develop practical scorecard measures for societal impact of research	Dec. 2021	Head, Programme chairs, Faculty meeting
4	Improve usefulness of Faculty scorecard	Review current measures for practicality and usefulness and revise as needed	Dec. 2021	Head, Programme chairs, Faculty meeting

2. STUDY PROGRAMMES

UOB261 Civil and Environmental Engineering (B.S. 180 ECTS)

Ch. 2.1.2	Teaching and Learning			
1	Modify B.S. programme to improve balance between Civil and Environmental Engineering in the programme	Revise the course on computational mechanics	Aug. 2020	Head, programme chairs, supervising Faculty member
2	Highlight sustainability as a major component of Civil and Environmental Engineering	Request supervising teachers to add a learning outcome relating to sustainability in their courses	Aug. 2020	Head, programme chairs, supervising Faculty member
3	Modify B.S. programme to improve balance between Civil and Environmental Engineering in the programme	Restructure courses among semesters (notably second semester)	Aug. 2020	Head, programme chairs
4	Modify B.S. programme to improve balance between Civil and Environmental Engineering in the programme	Provide students with additional opportunities to explore Civil or Environmental Engineering	Aug. 2020	Head, programme chairs
5	Modify B.S. programme to improve balance between Civil and Environmental Engineering in the programme	Make both computational methods and environmental technology mandatory	Aug. 2020	Head, programme chairs
6	Strengthen the image of the Faculty as both a Civil and Environmental Engineering department.	Request Faculty Meeting and Dean to approve changes in all (B.S., M.S., Ph.D.) course numbering from BYG and UBV to a joint UBV and perform change if permitted	Aug. 2020	Head

7	Modify B.S. programme to improve balance between Civil and Environmental Engineering in the programme	Update selected mandatory courses to better balance Civil and Environmental Engineering (e.g. Material Science and Geology)	Aug. 2020	Head, programme chairs, supervising Faculty member
8	Improve B.S. programme learning outcome coverage	Modify at least two courses to adequately cover B.S. programme learning outcomes d) and i)	Aug. 2021	Head, Programme Chairs, supervising Faculty member
9	Increase continuous assessment	Supervising Faculty members asked to lower weight of final exam and increase continuous assessment if the final exam is more than 70% of the final grade	Aug. 2022	Head, Programme Chairs and supervising Faculty members

BYG441 Civil Engineering (M.S. 120 ECTS) and UMV441 Environmental Engineering (M.S. 120 ECTS)

Ch. 2.2.1 Students				
1	Improve the graduate student community	Develop a graduate student seminar	Jan. 2019	Supervising teacher, Head
2	Improve the graduate student community and involvement in Faculty	Graduate students provide a representative at Faculty meetings	April 2020	Head
3	Better orientation and welcome	Work with School to unify and strengthen graduate student orientation and welcome	Sept. 2020	Head, Programme Chairs, School
4	Better support for international students	Improve English descriptions of the programmes and courses on the University website	Nov. 2020	Head, Programme Chairs, School student services
Ch. 2.2.2 Teaching and Learning				
1	Increase enrolment	Seek support from School to offer selected additional M.S. courses	Jan. 2019	Head, Programme chairs

2	Highlight sustainability as a major component of Civil and Environmental Engineering	Request supervising teachers to add a learning outcome relating to sustainability in their courses	Aug. 2020	Head, programme chairs, supervising Faculty
3	Improve course learning outcomes	Improve learning outcomes for courses based on review by Centre for Teaching and Learning	Aug. 2020	Head, Programme chairs, supervising Faculty
4	Strengthen M.S. programme student community and foundation in their specialization	Specify core courses for the M.S. programmes	Aug. 2020	Head, programme chairs
5	Improve M.S. programme learning outcome description	Develop learning outcomes for the thesis project based on the current evaluation rubric and the revised M.S. programme learning outcomes	Aug. 2020	Head, programme chairs
6	Increase enrolment	Seek Faculty Meeting approval for presenting the 3+2 B.S.+M.S. programme as one programme to undergraduates who can then register for the full B.S.+M.S. programme from the start	Aug. 2021	Head
7	Review prerequisites for M.S. programmes	Revise prerequisites for M.S. programmes	Aug. 2021	Head, programme chairs
Ch. 2.2.3	Coordination of Teaching and Research			
1	Strengthen and highlight M.S. programme link to Faculty research	Revise M.S. programme specialty fields to better match Faculty policy and strengths, e.g., in earthquake engineering and geotechnology	Aug. 2019	Head, programme chairs

BYG561 Civil Engineering (Ph.D. 210 ECTS), UMV561 Environmental Engineering (Ph.D. 210 ECTS), UMV564 Environmental Studies (Ph.D. 180 ECTS)

Ch. 2.3.1	Students			
1	Stronger involvement in Faculty, involve doctoral students in recruitment	Have selected doctoral students present graduate research opportunities to prospective M.S. students at a M.S. studies introduction at the University	March 2019	Head, advisors
2	Improve reception of international doctoral students	Recommend to the University that the International Office or Relocation Office help doctoral students with immigration issues and moving to Iceland	June 2019	Head
3	Improve access to Icelandic classes	Recommend to School and University that access of non-Icelandic speaking students to Icelandic classes be improved	June 2019	Head
4	Increase Ph.D. completion rate	Improve Ph.D. progress monitoring	Apr. 2020	Head and Chairs
5	Revise the Faculty's doctoral student regulations	Revise Faculty rules for doctoral studies and participate in unification across the School	June 2020	Head, programme chairs, Dean
6	Stronger involvement in Faculty	Increase teaching opportunities for doctoral students	Aug. 2021	Head, programme chairs, doctoral advisors
Ch. 2.3.2	Teaching and Learning			
1	Improve doctoral student community and awareness of each other's research	Develop a graduate student seminar	Jan. 2019	Supervising Faculty, Head
2	Highlight sustainability as a major component of Civil and Environmental Engineering	Request supervising teachers to add a learning outcome relating to sustainability in their courses	Aug. 2020	Head, programme chairs, supervising Faculty

3	Develop guidelines for expected research impact of doctoral research	Write guidelines for publications and dissemination of doctoral research into a revision of the Faculty's rules for doctoral studies	August 2020	Head, programme chairs
4	Improve programme learning outcomes	Revise Ph.D. programme learning outcomes following a revision of the M.S. learning outcomes	August 2021	Head, programme chairs