



**Report
of the Expert Panel
on the REACCREDITATION
of the University Postgraduate (Doctoral) Programme
Civil Engineering
Faculty of Civil Engineering, University of Rijeka**

**Date of the visit:
1st June 2016**

November, 2016

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INTRODUCTION

The Expert Panel appointed by the Agency for Science and Higher Education (ASHE) created this Report on the Re-accreditation of the University Postgraduate (Doctoral) Programme in Civil Engineering on the basis of the Self-Evaluation Report of the Programme, other documentation submitted and a visit to the Faculty of Civil Engineering, University of Rijeka

The Agency for Science and Higher Education (ASHE), a public body listed in EQAR (European Quality Assurance Register for Higher Education) and a full member of ENQA (European Association for Quality Assurance in Higher Education), re-accredits higher education institutions (hereinafter: HEIs) and their study programmes in line with the Act on Quality Assurance in Science and Higher Education (Official Gazette 45/09) and the Ordinance on the Content of a Licence and Conditions for Issuing a Licence for Performing Higher Education Activity, Carrying out a Study Programme and Re-Accreditation of Higher Education Institutions (OG 24/10). In this procedure parts of activities of higher education institutions and university postgraduate study programmes are re-accredited.

Expert Panel is appointed by the Agency's Accreditation Council, an independent expert body, to carry out independent evaluation of post-graduate university study programmes.

The Report contains the following elements:

- Short description of the study programme,
- The recommendation of the Expert Panel to the Agency's Accreditation Council,
- Recommendations for institutional improvement and measures to be implemented in the following period (and checked within a follow-up procedure),
- A brief analysis of the institutional advantages and disadvantages,
- A list of good practices found at the institution,
- Conclusions on compliance with the prescribed conditions of delivery of a study programme,
- Conclusions on compliance with the criteria for quality assessment.

Members of the Expert Panel:

1. Professor John Bridgeman, University of Birmingham, UK - President of the Expert Panel,
2. Professor Christopher Kotsakis, Aristotle University of Thessaloniki, Greece
3. Professor Peter van Oosterom, Delft University of Technology, Netherlands
4. Iliana Tsali, doctoral candidate, University of Calgary, Canada

5. Professor Ashraf S. Ayoub, City University London, United Kingdom of Great Britain and Northern Ireland
6. Professor Hendrik Voll, Tallinn University of Technology, Estonia
7. Nicholas Lippiatt, doctoral candidate, KU Leuven, Belgium
8. Professor Elias Kassa,, Norwegian University of Science and Technology (NTNU), Kingdom of Norway
9. Samer Sabry Fahmy Mehanny Gendy, doctoral candidate, City University London, United Kingdom of Great Britain and Northern Ireland
10. Professor Johan Verbeke, Aarhus School of Architecture, Denmark
11. Professor Elena Mussinelli, Politecnico di Milano, Italy
12. Professor Franklin van der Hoeven, Delft University of Technology, Netherlands
13. Teodora Iulia Constantinescu, doctoral candidate, Universiteit Hasselt, Belgium

The higher education institution was visited by the following Expert Panel members:

- Professor John Bridgeman, University of Birmingham, UK
- Professor Elias Kassa, Norwegian University of Science and Techology, Norway
- Mr Samer Gendy, doctoral candidate, City University, UK

In the analysis of the documentation, site visit and writing of the report the Panel was supported by:

- Durdica Dragojević, coordinator and interpreter, ASHE,
- Davor Došlinec, assistant coordinator, ASHE.

During the visit to the Institution the Expert Panel held meetings with the representatives of the following groups:

- Management,
- Head of PhD programme,
- Doctoral candidates,
- Teachers and supervisors,
- Alumni.

The Expert Panel also had a tour of the laboratories.

SHORT DESCRIPTION OF THE STUDY PROGRAMME

Name of the study programme contained in the licence: Postgraduate University Study Programme in CIVIL ENGINEERING

Institution providing the programme: Faculty of Civil Engineering Rijeka

Education provider(s): University of Rijeka

Place of delivery: Rijeka

Scientific area and field: Scientific area of Technical Sciences, fields of Civil Engineering and Fundamental Technical Sciences

Learning outcomes of the study programme: not stated

Number of doctoral candidates: 32

Number of teachers: 32

Number of supervisors: 26

RECOMMENDATION BY THE EXPERT PANEL TO THE ASHE'S ACCREDITATION COUNCIL

Upon the completion of the re-accreditation procedure and the examination of the materials submitted (Self-Evaluation Report etc.), the visit to the higher education institution and interviews with HEI members in accordance with the visit protocol, the Expert Panel renders its opinion in which it recommends to the Accreditation Council of the Agency the following:

issue a letter of expectations for the period up to three (3) years in which period the higher education institution should make the necessary improvements.

RECOMMENDATIONS FOR THE IMPROVEMENT OF THE STUDY PROGRAMME

1. Consider reductions in the number of classes to be taken by PhD students.
2. Consider ways in which the balance of teaching and research for research-active staff might be readdressed (e.g. via more innovative methods of teaching to reduce contact time).
3. Consider ways to increase flexibility in timing of student intake and so potentially increase student numbers.
4. Encourage staff to derive increased amounts of research funding, via e.g. H2020 and provide incentive measures for doing so.

5. Increase the frequency of reporting on PhD students' performance so that poorly-performing students can be identified sooner with increased likelihood of successful adjustment.
6. Provide clarity (either way) on the need for mentor attendance at the thesis defence.

ADVANTAGES OF THE STUDY PROGRAMME

1. Requirement to publish one paper in a reputable journal.
2. Three-month secondment at alternative institution.
3. Excellent laboratory facilities.
4. Good access to information via website.
5. Reward mechanism for publication.

DISADVANTAGES OF THE STUDY PROGRAMME

1. Lack of soft skills teaching (Project Management, in particular).
2. Significant obligation to attend classes.
3. Current lack of well-articulated research strategy. (It is accepted that this is forthcoming imminently).
4. Lack of internationalisation, either in the form of overseas PhD student intake or significant staff engagement with international research partners.
5. Availability of sufficient numbers of experienced technicians in the laboratory.

EXAMPLES OF GOOD PRACTICE

1. Three-month secondment at alternative institution.
2. Robust and quantitative assessment of candidates.
3. Connection of national problems to PhD topics.
4. Use of Turnitin for plagiarism.

COMPLIANCE WITH THE PRESCRIBED CONDITIONS FOR THE DELIVERY OF A STUDY PROGRAMME

Minimal legal conditions:	YES/NO notes
1. Higher education institution (HEI) is listed in the Register of Scientific Organisations in the scientific area of the programme, and has a positive reaccreditation decision on performing higher education activities and scientific activity.	Yes
2. HEI delivers programmes in the two cycles leading to the doctoral programme, i.e., first two cycles in the same area and field/fields (for interdisciplinary programmes), and employs a sufficient number of teachers as defined by Article 6 of the Ordinance on the Content of a Licence and Conditions for Issuing a Licence for Performing Higher Education Activity, Carrying out a Study Programme and Re-Accreditation of Higher Education Institutions (OG 24/10).	Yes
3. HEI employs a sufficient number of researchers, as defined by Article 7 of the the Ordinance on Conditions for Issuing Licence for Scientific Activity, Conditions for Re-Accreditation of Scientific Organisations and Content of Licence (OG 83/2010).	Yes
4. At least 50% of teaching as expressed in norm-hours is delivered by teachers employed at the HEI (full-time, elected into scientific-teaching titles).	Yes
5. Student: teacher ratio at the HEI is below 30:1.	Yes
6. HEI ensures that doctoral theses are public.	Yes
7. HEI launches the procedure of revoking the academic title if it is determined that it has been attained contrary to the conditions stipulated for its attainment, by severe violation of the studying rules or based on a doctoral thesis (dissertation) that has proved to be a plagiarism or a forgery according to provisions of the statute or other enactments.	Yes
Additional/ recommended conditions of the ASHE Accreditation Council for passing a positive opinion	YES/NO notes
1. HEI (or HEIs in joint programmes) has at least five teachers appointed to scientific-teaching titles in the field, or fields relevant for the programme involved in its delivery.	Yes
2. In the most recent reaccreditation, HEI had the standard Scientific and Professional Activity marked as at least "partly implemented" (3).	Yes
3. The doctoral programme is aligned with the HEI's research strategy.	Yes
4. The candidate : supervisor ratio at the HEI is not above 3:1.	Yes
5. All supervisors meet the following conditions: a) PhD, elected into a scientific title, holds a scientific or a scientific-teaching	Yes

<p>position and/or has at least two years of postdoctoral research experience;</p> <p>b) active researcher in the scientific area of the programme, as evidenced by publications, participation in scientific conferences and/or projects in the past five years (table 2, Supervisors and candidates);</p> <p>c) confirms feasibility of the draft research plan upon admission of the candidate (or submission of the proposal);</p> <p>d) ensures the conditions (and funding) necessary to implement the candidate's research (in line with the draft research plan) as a research project leader, co-leader, participant, collaborator or in other ways;</p> <p>e) trained for the role before assuming it (through workshops, co-supervisions etc.);</p> <p>f) received a positive opinion of the HEI on previous supervisory work.</p>	
<p>6. All teachers meet the following conditions:</p> <p>a) holds a scientific or a scientific-teaching position;</p> <p>b) active researcher, recognized in the field relevant for the course (table 1, Teachers).</p>	Yes
<p>7. The supervisor normally does not participate in the assessment committees.</p>	Varies
<p>8. The programme ensures that all candidates spend at least three years doing independent research (while studying, individually, within or outside courses), which includes writing the thesis, publishing, participating in international conferences, field work, attending courses relevant for research etc.</p>	Yes
<p>9. For joint programmes and doctoral schools (at the university level): cooperation between HEIs is based on adequate contracts; joint programmes are delivered in cooperation with accredited HEIs; the HEI delivers the programme within a doctoral school in line with the regulations and ensures good coordination aimed at supporting the candidates; at least 80% of courses are delivered by teachers employed at HEIs within the consortium.</p>	N/A

QUALITY ASSESSMENT

	Quality assessment
<p>1. RESOURCES: TEACHERS, SUPERVISORS, RESEARCH CAPACITIES AND INFRASTRUCTURE</p>	
<p>1.1. HEI is distinguished by its scientific/ artistic achievements in the discipline in which the doctoral study programme is delivered.</p>	<p>Improvements are necessary</p> <p>The Faculty has demonstrated an increasing number of scientific papers published in ISI journals. It is noted that there has been a year-on year increase every year since 2005 (with minor exceptions of 2010 and 2014 which saw modest reductions). Citations have also increased correspondingly, albeit there was a slight drop in 2010 and 2014. The degree of self-citation is not excessive.</p> <p>Considering citations, it is notable that of the top 10 mostly highly cited publications, 16 were (co-)authored by the same individual (Podobnik), and the same author is responsible for approximately 25% of the Faculty's total output (55 of 209 papers). 45 papers were published with Henry as (co-)author (although the panel notes some overlap with Podobnik), and Kozar and Horvatic have each (co-)authored 21 papers.</p> <p>It is pleasing to note the increased use of higher impact factor journals. 11 of 19 journals used in 2015 had IFs greater than 1.000.</p> <p>The Panel was able to identify only limited evidence of international research cooperation, either in securing overseas PhD students, or staff collaborating with other international partners (e.g. via H2020 projects). Similarly, there is little evidence of activity with influential national or international fora.</p>
<p>1.2. The number and workload of teachers involved in the study programme ensure quality doctoral education.</p>	<p>Improvements are necessary</p> <p>The number of teaching staff involved in the study programme is appropriate to the size of PhD student cohorts and, indeed, the Panel noted the potential for expansion in student numbers based on current staff numbers.</p> <p>The Panel felt that staff had a high teaching load</p>

	<p>(~70% of total time), leaving less than optimal time available for research. The Panel discussed with the management team the potential opportunities for reducing contact time via the use of more innovative teaching methods.</p>
<p>1.3. The teachers are highly qualified researchers who actively engage with the topics they teach, providing a quality doctoral programme.</p>	<p>Improvements are necessary All mentors are required to have a PhD and some prior supervisory experience (i.e. as a co-supervisor). As noted in 1.1, there is evidence of good use of a broad spread of high impact ISI journals. Whilst quantity is no surrogate or replacement for quality of papers, the Panel felt that, although increasing, the rate of publications from the Faculty could be increased (i.e. 25 papers from 26 mentors in 2015 is not a high average rate of publication).</p>
<p>1.4. The number of supervisors and their qualifications provide for quality in producing the doctoral thesis.</p>	<p>Improvements are necessary The ratio of candidate : supervisor is 1.23 : 1 (32 : 26), and is therefore appropriate (indeed, there is room for some expansion of student numbers). The Panel was pleased to be able to scrutinise some high quality publications arising from the PhD students' research which in some instances had been published in high quality journals. As stated in 1.1, the Panel felt there was room for increased engagement by teaching staff with international projects (either leading or participating). The Panel felt that there was clearly a disparity in level of experience between mentors. To some extent, this is inevitable when the age and experience profile of staff varies. That said, the Panel felt that the Faculty should take care to ensure that lesser experienced supervisors are able to enjoy the support of a more experienced co-supervisor. The lack of robust mechanisms for defining the stage at which a PhD student is obliged to withdraw from their programme meant that the Panel found it challenging to clarify completion rates of all students. For example, there are students who have been registered since 2006 but have not yet voluntarily withdrawn or been withdrawn. Nevertheless, the</p>

	<p>Panel noted that the average time to completion appeared to be within the six-year period that the Faculty deemed to be average and appropriate. This period of time would appear to be standard in Croatia, but the Panel noted that this was long in comparison to international standards, where the average is more often four years. To some extent, the six-year completion period is a result of the bulk of the Faculty's PhD students being either Teaching Assistants employed at the University, or external students employed elsewhere (e.g. in industry).</p>
<p>1.5. The HEI has developed methods of assessing the qualifications and competencies of teachers and supervisors.</p>	<p>High level of quality</p> <p>The Panel noted that the Faculty operates a set of minimum criteria for supervision - PhD, leader or co-leader of a research project, 2 years postdoc experience, 6 papers (3 foreign), and previous supervision experience. The Panel felt that these were appropriate standards and was pleased to see that they were implemented by the Faculty.</p>
<p>1.6. The HEI has access to high-quality resources for research, as required by the programme discipline.</p>	<p>Improvements are necessary</p> <p>The Panel noted and welcomed the very recent investment in laboratory facilities, and agreed with staff and students alike that this should lead to an improvement in research capabilities and outputs. Indeed, the Panel observed these facilities to be of high quality and commended the Faculty on the investment. However, the Panel noted that the allocation of one Technician per laboratory may, in time, lead to some resource difficulties and that without sufficient experienced Technician support, the laboratories may not be able to provide the required amount of support to undergraduate teaching, research projects and commercial endeavours. It was clear from discussions with staff that the Faculty is aware of this potential issue. The Panel felt that a watching brief should be maintained over this issue so that appropriate action (i.e. provision of additional Technician resource) could be made available as and when required.</p> <p>The Panel noted that whilst staff and PhD students have access to Science Direct, not all relevant journals</p>

	<p>are included in the current subscription package held by the Faculty and University. The Panel understands that only limited state funding is provided for subscriptions, but felt that the Faculty or University may wish to consider supplementing these funds from other resources in order to ensure that all staff and students have straightforward access to the required journals.</p>
<p>2. INTERNAL QUALITY ASSURANCE OF THE PROGRAMME</p>	
<p>2.1. The HEI has established and accepted effective procedures for proposing, approving and delivering doctoral education. The procedures include identification of scientific/ artistic, cultural, social and economic needs.</p>	<p>Improvements are necessary</p> <p>The Panel noted that there are established regulations for launching and approving doctoral programme. The justification of starting the study program is the university's plan to reform the existing study programmes (university, vocational and postgraduate studies) and implement the Bologna process.</p> <p>The Faculty was guided by previous experience to form the doctoral study program. The national labour market demand and requirement, the Croatian integration into the European area of knowledge and work, the resources of the Faculty in terms of its research staff capacity, as well as experts in civil engineering, were the bases for proposing the doctoral study program. However, the Panel was advised that the interest to join the doctoral study is low and those who are joining are doing so for job security, primarily in academia. There is no motivation that doctoral students will attract improved employment opportunities in the labour market.</p> <p>One suggestion for future selection of specialisation is to involve the stakeholders to identify the real demand and the knowledge and research gaps that need to be met, and to twin the study programme with national demand. One good example of such activity in the doctoral programme is the study field of Hydrotechnics of coastal areas which laces a special emphasis on regional issues such as the North Adriatic region and the development of related competences in the future doctoral students.</p>

	<p>During the interview, the Expert Panel was advised that in the doctoral programme, there are areas of specialisation identified in the fields of hydraulic engineering, geotechnical engineering, construction, and transportation. In the two-page summary of the strategic document, there is an indication of more than 20 research fields that may be clearly identified in the next strategy document. At the time of the interview, there is no clearly defined strategy. The panel believes that the procedure for proposing, approving and delivering the doctoral programme would be covered when the strategy is developed.</p>
<p>2.2. The programme is aligned with the HEI research mission and vision, i.e. research strategy.</p>	<p>Improvements are necessary The strategy of the Faculty is to pursue scientific research activities within the scientific field of Civil Engineering, particularly in the fields of: Geotechnics, Hydrotechnics, Bearing Structures, Organization and Technology of Construction, and Roads; within the scientific fields of Materials, Fluid Mechanics and Technical Mechanics.</p> <p>The Panel believes that the advanced laboratory facilities will contribute to the quality of the research in the scientific fields of Civil Engineering and this will be a potential for joint international research and inclusion of industry in research activities.</p> <p>The study programme is aligned with some of the strategic objectives of the Faculty. The initiative of doctoral students exchange programme is in line with the strategic objective. However, the study program lacks some strategic objectives, such as connection with the needs of the community and the economy, and integration with other European Union nations in the form of joint research collaboration.</p>
<p>2.3. The HEI systematically monitors the success of the programmes through periodic reviews, and implements improvements.</p>	<p>Improvements are necessary The Faculty has a committee for doctoral studies to control the quality of the programme. The seven members of the Committee comprise management, teaching and student representatives. The Committee holds meetings periodically, at least 4 times a year, and if necessary, invites the Dean or the mentors to its</p>

	<p>sessions. The committee continuously analyses the existing study programme, and reviews its implementation and identifies any issues related to its performance.</p> <p>A procedure is available to report the candidate's progress in the semi-annual and annual reports to ensure the productive and continuous work of doctoral students. The mechanism to give feedback from the candidates concerning the supervision systems does not encourage candidates to openly express their feedback.</p> <p>There is no mechanism established for periodic international and/or national programme reviews. A mechanism to collect and analyse feedback from alumni and drop-outs concerning the supervision system is missing. It would also be helpful for the programme to collect and analyse feedback from the stakeholders (e.g. future employers). The Faculty may wish to reflect on the above points to improve the monitoring procedure of the study programme.</p>
<p>2.4. HEI continuously monitors supervisors' performance and has mechanisms for evaluating supervisors, and, if necessary, changing them and mediating between the supervisors and the candidates.</p>	<p>Improvements are necessary</p> <p>Mentors at the study programme are evaluated by the candidates. Through the interview, most of the candidates expressed caution that this procedure may affect negatively the relationship with their mentors.</p> <p>The Committee for the Doctoral Study Programme has a mechanism to mediate in case of problems between a supervisor and a candidate and there is a possibility of allocating a new mentor to the candidate.</p> <p>There is a publication-based reward for authors, including mentors and their doctoral students, based on the criteria of the highest impact factor.</p> <p>During the interview, the current and former candidates gave positive feedback regarding the overall study programme.</p> <p>The average completion rate is six years</p> <p>The candidates' research performance or additional lists and analyses of publications was not provided to the Panel.</p>
<p>2.5. HEI assures academic integrity and freedom.</p>	<p>Improvements are necessary</p> <p>The Faculty has an electronic authentication system</p>

	<p>to ensure scientific integrity and for the prevention of plagiarism.</p> <p>The Code of Ethics of the University of Rijeka was made available to the Panel. The goal is to encourage understanding and acceptance of the basic principles of morally justified behaviour, and to define professional rights and responsibilities.</p>
<p>2.6. The process of developing and defending the thesis proposal is transparent and objective, and includes a public presentation.</p>	<p>High level of quality</p> <p>The Panel scrutinised samples of thesis proposals and proposal templates during the site visit.</p> <p>The Study Programme has procedures for drafting and defending a topic of a doctoral dissertation.</p> <p>The Faculty Council appoints a Commission for the Assessment of Doctoral Dissertation Topic.</p> <p>Candidates are required to publicly defend the doctoral dissertation.</p>
<p>2.7. Thesis assessment results from a scientifically sound assessment of an independent committee.</p>	<p>High level of quality</p> <p>The Panel felt that the study programme demonstrated areas of good quality on the following bases:</p> <p>The Faculty has procedures for developing and defending the doctoral thesis, and guidelines for assessment of published thesis.</p> <p>The Faculty assigns a Doctoral Dissertation Assessment Committee to evaluate the doctoral dissertations. One member of the evaluation committee is sourced externally from another university or research institution.</p> <p>The Faculty requires candidates to have at least one publication in an international journal, prior to completion of doctoral education.</p> <p>Candidates are allowed to submit theses based on traditional monograph format, or using a set of publications. All the sample theses the panel scrutinised were monographs.</p>
<p>2.8. The HEI publishes all necessary information on the study programme, admissions, delivery and conditions for progression and completion, in accessible outlets</p>	<p>Improvements are necessary</p> <p>The Panel was not able to access the necessary information about the doctoral study programme on the faculty home page in English.</p>

and media.	
<p>2.9. Funds collected for the needs of doctoral education are distributed transparently and in a way that ensures sustainability and further development of doctoral education (ensures that candidates' research is carried out and supported, so that doctoral education can be completed successfully).</p>	<p>Improvements are necessary The Faculty generates revenues from teaching activities at undergraduate, graduate, and postgraduate doctoral study programmes. The other sources are from scientific research activities and performing professional activities. The Panel interviewed current candidates and alumni about their funding sources, and most of them are or were employees of the Faculty. Some candidates advised that they have additional funding from the research projects in which their own doctoral research is based. Only one of the alumni was funded through the industry. Out of the current candidate, one is funded through the government research funding. The Panel believe that the Faculty should widen the system of funding the doctoral programme through other means, such as national research council calls, EU grants and establishing partnerships with industries.</p>
<p>2.10. Tuition fees are determined on the basis of transparent criteria (and real costs of studying).</p>	<p>Improvements are necessary The distribution of the revenue from teaching activities are determined by the laws or regulations of the University of Rijeka and the Faculty. 40% of the revenue from teaching activities goes to the improvement of activities of the Faculty (procurement of equipment, literature, investments and maintenance). 3% goes to the annual budget of the University while 2% goes to all employees, in proportion to the time spent at work. 0.30% of the teaching revenue goes to the Fund for the improvement of research activities, and scientific research and educational training. The remaining amount of income from teaching activities goes to cover the operating costs of the Faculty, to pay for the work required outside the standardized regular activities of teachers and associates of the Faculty, and for the payment of contracted work of external teachers and associates. Previously, the cost for research at the Faculty was</p>

	<p>higher due to the need for using laboratory facilities from other universities. This may change as the Faculty now has its own laboratory facility that can be used for research activities.</p>
<p>3. SUPPORT TO DOCTORAL CANDIDATES AND THEIR PROGRESSION</p>	
<p>3.1. The HEI establishes admission quotas with respect to its teaching and supervision capacities.</p>	<p>Improvements are necessary The Panel found that the number of available supervisors is sufficient to mentor the enrolled students. The number of candidates for whom a supervisor has responsibility is in most cases not more than three. Quotas are usually proposed by the supervisors based on actual capacity and available funds, and the final decision is made by the committee of doctoral study programmes. It was noted by the Panel that some supervisors exceed the workload specified hours and that most of them dedicate more time for teaching than research (teaching: research ratio 70:30). The Panel recognised the potential for expansion in research student numbers based on current staff numbers.</p>
<p>3.2. The HEI establishes admission quotas on the basis of scientific/ artistic, cultural, social, economic and other needs.</p>	<p>Improvements are necessary The Panel was advised that the study programme is not opened for admission every year due to the limited number of applying students. Two doctoral students have successfully defended their dissertations and subsequently taken up positions in engineering companies. The Panel found that the number of research projects linked with businesses is limited. However, a meeting with the stakeholders was not arranged.</p>
<p>3.3. The HEI establishes the admission quotas taking into account the funding available to the candidates, that is, on the basis of the absorption potentials of research projects or other sources of funding.</p>	<p>Improvements are necessary The Faculty is required to evaluate the ability of all applicants to the study programme to pay for the expenses of study, especially for non-funded students. The Faculty should admit only those who can assure that the cost of studying will be covered.</p>

	<p>The Panel believe that the Faculty should take measures to encourage its staff to derive increased amounts of research funding, via e.g. H2020.</p>
<p>3.4. The HEI should pay attention to the number of candidates admitted as to provide each with an advisor (a potential supervisor). From the point of admission to the end of doctoral education, efforts are invested so that each candidate has a sustainable research plan and is able to complete doctoral research successfully.</p>	<p>High level of quality</p> <p>The Panel was advised that each student is assigned a potential supervisor and that the candidates are required to submit a declaration of acceptance of mentoring.</p> <p>The Panel also found out that the criteria for the selection of candidates is clear and priority is given to candidates who wish to study full-time.</p> <p>The Panel was encouraged to note that most of the enrolled students are highly dedicated to their chosen field of academics and are qualified to carry their research.</p> <p>The Panel believes that the Faculty should ensure that experienced co-supervisors are always officially involved in research led by lesser experienced supervisors.</p> <p>Nevertheless, the Panel found this to be an area of high quality.</p>
<p>3.5. The HEI ensures that interested, talented and highly motivated candidates are recruited internationally.</p>	<p>Improvements are necessary</p> <p>The selection of candidates for the enrolment in the study programme is undertaken by the committee and based on the rules of the Postgraduate University study programme in Civil Engineering.</p> <p>An interview is held for applicant candidates.</p> <p>It was clear to the Panel that the call for applications for the PhD programme does not attract international students. The Panel recommends that the programme be advertised not only in the University website but through international websites such as (www.findaphd.com) and (www.phdportal.eu). Also online interviews should be undertaken for foreign applicants.</p>
<p>3.6. The selection process is public and based on choosing the best applicants.</p>	<p>Improvements are necessary</p> <p>The Faculty requires that applicants must fulfil specific preconditions in order to apply for the study programme; these may include success at the previous level of study, evaluation of the graduate thesis, student awards and activities,</p>

	<p>recommendations from mentors, interest of candidates to study full-time.</p> <p>The Panel believes that any previous journal publications of applicant should be explicitly mentioned as a major criteria for the selection of applicants especially when the programme is externally funded.</p>
<p>3.7. The HEI ensures that the selection procedure is transparent and in line with published criteria, and that there is a transparent complaints procedure.</p>	<p>High level of quality</p> <p>The Panel noted that</p> <ul style="list-style-type: none"> - the list of selected candidates is made public. -Unsuccessful candidates have the right to complain. -The deadline for lodging a complaint and the response period are published. -The applicants who were not admitted have the right to inspect the argumentative weakness and strengths of their applications. -Documents are archived. -The Panel believes that the selection procedure is transparent and clear, and that this is an area of high quality.
<p>3.8. There is a possibility to recognize applicants' and candidates' prior learning.</p>	<p>Improvements are necessary</p> <p>The Panel was advised that a candidate who has published three scientific papers in recognised journal scan be exempt from 48 ECTS credits.</p> <p>The Panel believes this to be an unrealistically high requirement.</p>
<p>3.9. Candidates' rights and obligations are defined in relevant HEI regulations and a contract on studying that provides for a high level of supervisory and institutional support to the candidates.</p>	<p>Improvements are necessary</p> <p>Student obligations are divided between course, scientific research work, teaching and knowledge transfer.</p> <p>Scientific and research activities include preparation of a doctoral proposal dissertation topic, public defence of the doctoral dissertation topic, development and application of the doctoral dissertation, adoption of a positive report of the expert commission, publishing an original scientific paper in which the student is the main author in an international scientific journal and the public defence of the doctoral dissertation.</p> <p>The panel recommends that the Faculty increases the frequency of reporting on PhD students' performance</p>

	<p>instead of only the semi-annual report, so that poorly-performing students can be identified sooner with increased likelihood of successful adjustment. This could be achieved by creating an online system where mentors and students are required to keep written records of monthly meeting and progression of the research work.</p>
<p>3.10. There are institutional support mechanisms for candidates' successful progression.</p>	<p>High level of quality The Panel was advised that the performance of all candidates is assessed on a semi-annual basis and the Faculty Management Committee analyses the success of the study programme in general.</p>
<p>4. PROGRAMME AND OUTCOMES</p>	
<p>4.1. The content and quality of the doctoral programme are aligned with internationally recognized standards.</p>	<p>Improvements are necessary The Panel assessed the quality of the programme based on the SER and the interviews. Whilst the programme is organised to allow candidates for at least three years independent research work, from the interview of the current PhD students and alumni, the Panel found that this may not be the case for a certain candidate groups. In particular, those following a 2+2 year model may not be able to devote sufficient time to focussed research as half of the duration is occupied by compulsory and elective courses. There are three mandatory and four elective courses included in the programme. The compulsory courses are given in the first semester while the four elective courses are dependent on the candidate's thesis topic. There is one compulsory course of generic (transferable) skills "research methodology, research ethics" but there is a lack of some other transferable skill courses such as project management. The Panel found that on average it takes six years to complete the PhD programme, in which about two years is allocated to course work. Most of the PhD students are Faculty staff and undertake teaching assistant tasks of approximately 7-10 hours per week with a consequential and detrimental impact on time allocated to independent research. The Panel believes that this will have some effect on the quality of the</p>

	<p>programme.</p> <p>As a measure of quality, the Panel believe that the study programme should have some reference to, and comparison with, other international HEIs; unfortunately, this currently missing. However, the requirement for one scientific paper with the candidate being the main author in an international scientific journal is one very good control mechanism on the quality of the doctoral dissertation. Further, the requirement for at least three months stay in other HEIs provides a degree of international collaboration, which may also have a positive effect on the quality of the doctoral programme.</p> <p>The programme duration is much longer in comparison to international standards (three years in the UK, four years in Sweden in which one year is for reading courses).</p> <p>The 2:3 ratio between teaching and research is higher than the Scandinavian model which is 1:3. The number of compulsory and elective course is much higher than in other HEIs elsewhere in the world.</p> <p>The Panel felt that the number of specialisations, as listed in the summary of the strategic document, is very broad. The SER explained that there is an opportunity for interdisciplinary research by assigning two mentors from different fields to a project; however, the Panel felt that the Faculty could take measures to increase the degree of interdisciplinarity by, for example, engaging with other Faculties within and beyond the University, to a greater extent.</p> <p>The Panel felt that the content and quality of the doctoral programme could be improved to be aligned more closely with internationally recognized standards and that some comparison with recognised HEIs is necessary.</p>
<p>4.2. Programme learning outcomes, as well as the learning outcomes of modules and subject units, are aligned with the level 8.2 of the CroQF. They clearly describe</p>	<p>Improvements are necessary</p> <p>The learning outcomes for the different courses were not available during the Panel’s visit. The SER states that the learning outcomes are not explicitly listed but demonstrated through student activities as required</p>

<p>the competencies the candidates will develop during the doctoral programme, including the ethical requirements of doing research.</p>	<p>by the individual courses.</p> <p>The Panel learnt from the interviews and the SER that in addition to one Transferable Skill course “Methodology of Scientific Research”, the other required courses in the doctoral programme are Higher Applied Mathematics and Numerical Methods in Engineering. There is one additional course required for each specialisation. The Panel learnt that with the new system of 3+2+3, certain study levels at the CroQF level 7 are omitted, and the courses offered in the doctoral programme are to make up for the lack of acquired knowledge that would otherwise have been provided at the graduate and undergraduate level.</p> <p>The course offered in the first semester in Methodology of Scientific Research covers Research Ethics.</p> <p>The Panel held interviews with candidates and scrutinised theses to assess whether the programme allows candidates to acquire transferable skills and competences. The Panel found that:</p> <ul style="list-style-type: none"> - specific research competences are acquired - project planning and management competencies in the form of developing research proposals, organising research, leading research group are missing - research methodology, reading and writing skills are provided as a mandatory course - teaching and assessment skills are acquired through teaching tasks and presenting of research - awareness of research ethics is provided as part of the mandatory course. <p>The Panel concluded that for each teaching course and for the overall doctoral programme the learning outcomes should be better articulated.</p>
<p>4.3. Programme learning outcomes are logically and clearly connected with teaching contents, as well as the contents included in supervision and research.</p>	<p>Improvements are necessary</p> <p>The Panel found that the learning outcomes of the doctoral programme are not explicitly listed in the SER. According to the SER, publication of one paper in an international per-reviewed journal, together with a study visit at another institution for research, both of</p>

	<p>which are obligatory for each candidate, implicitly describe the intended learning outcome of the programme. The learning outcomes for the individual courses are not listed in the SER. The elective courses are developed by an assessment of the development needs of the individual candidates in consultation with the mentors. From the interview, the Panel found that some of the courses are clearly aligned with the individual research work while there are courses with no clear link to the individual research work.</p> <p>From the interviews with the candidates and alumni, the Panel observed that that the learning outcomes are only partly or insufficiently aligned with individual courses, supervisory work and research.</p>
<p>4.4. The doctoral programme ensures the achievement of learning outcomes and competencies aligned with the level 8.2 of the CroQF.</p>	<p>High level of quality</p> <p>The principal quality assurance procedure stated in the SER is successful defence of the dissertation. The Panel scrutinised sample theses and candidates' publications. Some of the topics were found to be aligned with national issues and problem solving. The work of some candidates addressed high level numerical modelling while others were more focussed on field-intensive and experimentally-based research. The Panel found that the published papers and the theses are of high quality which ensures the quality and level of achieved learning outcomes.</p>
<p>4.5. Teaching methods (and ECTS, if applicable) are appropriate for level 8.2 of the CroQF and assure achievement of clearly defined learning outcomes.</p>	<p>Improvements are necessary</p> <p>The classes of the required courses are conducted in the ex-cathedra format through lectures, consultations, seminars, exercises, etc. The evaluation is in the form of essay writing, workshops and seminars by the students.</p> <p>For the elective courses, the classes are conducted through individual consultation or seminars. The evaluation is through writing reports and seminars. The Panel found that the teaching methods for the elective courses are appropriate for the level 8.2 but recommends reducing the number of taught courses.</p>
<p>4.6. The programme enables acquisition of general (transferable) skills.</p>	<p>Improvements are necessary</p> <p>The study programme provides one generic (transferable) skills course in teaching skills and</p>

	<p>transfer of knowledge with the objective to improve the communication skills and the skills of knowledge transfer, and popularization of science and the profession. This obligatory element can carry a minimum of 12 ECTS points. The Panel learnt that the forms of teaching and knowledge transfer include teaching at university courses, presentations on scientific events, participation in workshops to improving the quality of teaching, etc.</p> <p>The Panel felt that some of the taught courses included in the doctoral programme could be replaced by Transferable Skills such as project management skills, applying for funding, business and managerial skills.</p>
<p>4.7. Teaching content is adapted to the needs of current and future research and candidates' training (individual course plans, generic skills etc.).</p>	<p>Improvements are necessary</p> <p>There is a large number of elective teaching courses which a doctoral student can choose in agreement with the mentor/advisor to be aligned with the candidate's scientific interests. There is also one mandatory course that each candidate fulfils in each specialisation line. Although the flexibility to choose teaching content is positive, enabling students to adapt to the needs for their individual current and future research work, it may also create a huge burden on the supervisors and the candidates to accomplish the large number of teaching tasks.</p>
<p>4.8. The programme ensures quality through international connections and teacher and candidate mobility.</p>	<p>High level of quality</p> <p>Each doctoral student is obliged to spend a period of study at another research institution in which at least 20 ECTS credits are acquired according to the programme regulation. Information about the possibilities for the mobility of doctoral students is available and students are encouraged for the research exchange. This has been confirmed through the interview of candidates and alumni who have stayed at other HEIs.</p> <p>The candidates have the opportunity to write the thesis in Croatian and English language. A doctoral dissertation can be submitted in the form of a monograph or based on collection of published scientific papers (Scandinavian model).</p>

	<p>The Faculty intends to invite scientists from other institutions to establish cooperation among the research staff and PhD student's research work. The SER listed a number of international scientists and researchers who work as mentors and teachers at the doctoral programme. However, the program lacks a means to attract excellent international candidates to the programme. The Panel was advised that there is no international candidate enrolled in the programme. The Panel felt that the doctoral program can be considered to be of high quality for its strong mobility of students and research staff, but that there is scope for internationalisation of the programme to be improved.</p>
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*** NOTE: RECOMMENDATIONS OF THE EXPERT PANEL TO THE ASHE'S ACCREDITATION COUNCIL AND QUALITY LABEL**

The role of the Expert Panel in the re-accreditation of doctoral study programmes is manifold. The Expert Panel or part of the Expert Panel visiting a higher education institution drafts a report on the basis of a self-evaluation report, the accompanying relevant documentation, and a site visit to HEI. The draft report is adopted by all members of the Cluster Expert Panel, while the president of the Cluster Expert Panel is responsible for coordinating the assessment levels.

The report contains an assessment on whether a doctoral study programme delivered at a higher education institution complies with the prescribed laws and by-laws, as well as any additional/recommended requirements defined by the Agency's Accreditation Council, and whether a higher education institution can obtain a positive, i.e. satisfactory quality assessment according to the criteria set out in this document. Moreover, the Expert Panel must make recommendations for quality improvement.

Based on the assessment of all these elements, the Expert Panel may propose to the Accreditation Council of the Agency to issue either a confirmation on compliance, a letter of expectation for the period up to three (3) years in which period the higher education institution should eliminate the identified deficiencies, or to deny the license.

If the Expert Panel has assessed that a doctoral study programme delivered by a higher education institution does not meet legal and other requirements or that the quality of a study programme is not ensured (i.e. that HEI does not meet additional requirements or recommendations made by the Accreditation Council, or has a very poor quality assessment), they should propose to the Accreditation Council to deny the license.

If the Expert Panel considers that the relevant laws and bylaws have been met by a higher education institution, but that certain elements mentioned above do not meet the quality requirements, while they consider that the identified shortcomings can be corrected within a time frame of three years, they should issue a letter of expectation.

If the Expert Panel considers that all legal and additional/recommended requirements have been met and the quality assessment is satisfactory, i.e. that a study programme fulfils the learning outcomes appropriately defined for that level and scientific area, they may propose the issuance of a certificate and have a HEI commit to quality improvement and reporting to the Agency during the follow-up period.

Finally, if the Expert Panel has, in accordance with the criteria mentioned above, proposed issuing the certificate of compliance and assessed that, in addition to meeting the minimum quality requirements – i.e. the qualification framework level - for a study programme, the programme should be identified as a doctoral programme of a 'high

level of quality', the Expert Panel may propose to the Agency's Accreditation Council that such a doctoral study programme be awarded the 'high quality label'. Thus the Agency, with the consent of the Accreditation Council, grants a higher education institution the right to use the label for their academic and promotional purposes.

The 'high quality label' cannot be proposed or awarded to a programme or a higher education institution that does not comply with the requirements laid down by the laws and bylaws mentioned in this document, and any additional requirements recommended by the Accreditation Council. Moreover, the quality assessment awarded to a study programme should reflect a high level of quality inasmuch that at least half of the sub-criteria in each of the quality assessment criteria are assessed as being of high quality. The Accreditation Council of the Agency issues a final opinion on the label awarded. The content and form of the quality labels shall be prescribed by the Agency in a relevant general act.

The Accreditation Council of the Agency discusses the final report with all recommendations and suggestions, and issues their opinion on the report. Based on a prior opinion of the Accreditation Council, the Agency issues an Accreditation Recommendation to the minister responsible for science and higher education, and upon receipt of the minister's final decision on the outcome of the procedure, awards the 'high quality label' to a higher education institution.