



**RE-ACCREDITATION OF THE FACULTY OF CIVIL
ENGINEERING
UNIVERSITY OF ZAGREB**

**Name of the Evaluated Institution
Faculty of Civil Engineering of the University of Zagreb**

Site visit 23-24 May 2012

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COMPOSITION OF THE EXPERT PANEL

- Professor Henrik Harder, Aalborg University, Denmark (Chair)
- Professor John Goliás, National Technical University of Athens, Greece
- Professor Peter Bak Frigaard, Aalborg University, Denmark
- Professor Snježana Knežić, University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Split, Croatia
- Student Andrea Štitić, Faculty of Civil Engineering, Rijeka, Croatia

CONTENTS

| | |
|---|----|
| INTRODUCTION | 4 |
| Short Description of the Evaluated Institution | 4 |
| The Work of the Expert Panel | 6 |
| DETAILED ANALYSIS BASED ON STANDARDS AND CRITERIA FOR RE-ACCREDITATION | 7 |
| 1) Management of the Higher Education Institution and Quality Assurance | 7 |
| 2) Study Programmes | 8 |
| 3) Students | 10 |
| 4) Teachers | 11 |
| 5) Scientific and Professional Activity | 12 |
| 6) International Cooperation and Mobility | 13 |
| 7) Resources, Administration, Space, Equipment and Finance | 13 |
| FINAL REPORT AND RECOMMENDATIONS BY THE EXPERT PANEL FOR THE ACCREDITATION COUNCIL | 15 |
| STRONG POINTS | 15 |
| WEAK POINTS | 15 |
| GENERAL RECOMMENDATIONS | 16 |
| RECOMMENDATIONS FOR IMPROVEMENT OF QUALITY | 17 |

INTRODUCTION

Short Description of the Evaluated Institution

The University of Zagreb, the Faculty of Civil Engineering continues the tradition of the Polytechnic established in 1919. In 1926 the Polytechnic became the Technical Faculty within the University of Zagreb and its civil engineering department became the department of the Technical Faculty. The Technical Faculty changed its organisation in 1956 when four of its departments were reorganised into four independent faculties, of which one was the Faculty of Architecture, Civil Engineering and Geodesy with three departments: architecture, civil engineering and geodesy. In 1962 three new faculties were established: the Faculty of Architecture, the Faculty of Civil Engineering and the Faculty of Geodesy.

The Faculty of Civil Engineering integrated with the Croatian Civil Engineering Institute thus became the Faculty of Civil Engineering Science within the newly founded Civil Engineering Institute of Croatia in 1977. Two existing high schools of Civil Engineering (High Technical School for Building Material Industry and High Civil Engineering School) joined the Faculty in 1977. Following the status changes in the Civil Engineering Institute, the Faculty of Civil Engineering was established in 1991. The professional studies in Construction were separated from the Faculty of Civil Engineering in 1998. During 2003 the Construction Department at the Polytechnic of Zagreb was separated from the Faculty of Civil Engineering of University of Zagreb by an agreement, resulting in the withdrawal of professional studies from the Faculty of Civil Engineering.

During 2005 former graduate studies (before implementation of Bologna Declaration) were restructured into undergraduate and graduate studies. According to the provisions of the Science and Higher Education Act undergraduate civil engineering studies were established for the first time in academic year 2005-2006, and graduate civil engineering studies started in 2008-2009. Education necessary for performing highly professional activities in individual civil engineering fields is gained at seven specializations in graduate studies: geotechnics, water resources, structures, materials, construction management, transportation and structure modelling. In the academic year 2006-2007 postgraduate specialised studies in civil engineering were started in the following fields: water resources, structures, bridges, fire engineering, numerical and experimental analysis of structures and organisation and civil engineering management. In 2006-2007 postgraduate doctoral studies in civil engineering were established in the

following fields: geotechnics, water resources, engineering structures, civil engineering materials, mechanics of structures, organisation and management in civil engineering and traffic engineering.

The Faculty is headed by a Dean who is supported by four Vice-deans, with specific responsibilities. The Council is the Faculty expert body. The Council appoints and approves permanent or temporary bodies that solve particular issues within its authority. The Faculty is organised in nine departments, with chairs. The Faculty operates in nine Departments. A department is the Faculty organisational unit performing activities within particular field. Chairs and laboratories are established within the departments. A chair is organisational unit, which organises teaching and scientific activities, while laboratories perform activities mainly within the scope of the Faculty's activities.

The civil engineering studies were established 92 years ago and to date more than 7500 students have graduated from it, more than 500 have achieved master's degree, and about 200 doctors of science have been promoted.

The enrolment quota for undergraduate study in academic years 2009-2010 and 2010-2011 was 195 students (in academic year 2007-2008 quota was 250). The enrolment quota for graduate studies is higher than the one for undergraduate studies, i.e. 225 full-time students. In academic year 2010-2011 enrolment quota for postgraduate doctoral study was 80, and 11 students were enrolled, while at postgraduate specialist study enrolled 17 all for Organization and Construction Management specialisation (this study hasn't got quota).

The structure of the teachers is:

- 63 teachers in scientific-educational ranks ranging from senior assistant to full professors (30 Full professors, 18 Associate professors, 11 Assistant professors, 4 work for two employers),
- 8 teachers in educational ranks (of which 3 have the contract with the Faculty for other jobs),
- 54 associates: assistant and junior researchers,
- 4 experts associates in teaching,
- 5 laboratory assistants,
- 28 outsourced collaborators (7 teachers in scientific-educational rank, 3 teachers in educational ranks and 18 associate assistants).

The Work of the Expert Panel

For its work the panel drew upon the self-evaluation report, prepared by the Faculty of Civil Engineering of the University of Zagreb. They carried out a site visit to the campus of the Faculty on 23 and 24 May. During the visit to Zagreb they saw the premises and physical resources and held meetings with the following groups:

- Faculty Management Board
- The Self-Evaluation Group and the QA Committee
- Heads of Department
- Teaching Assistants
- Students
- The Vice-Dean for Curriculum and Student Affairs,
- Heads of Study Programmes (undergraduate, graduates, professional and postgraduate)
- The Vice-Dean for Professional Work
- Vice-Dean for Science
- Leaders of research projects

They also examined the facilities at the Zagreb campus and visited a few classes, in two of which they held a brief question and answer session with the students.

DETAILED ANALYSIS BASED ON STANDARDS AND CRITERIA FOR RE-ACCREDITATION

1) Management of the Higher Education Institution and Quality Assurance

- 1.1 The mission statement of the institution states, that it is the oldest civil engineering faculty in Croatia conducting university education at undergraduate, graduate and postgraduate levels in all the fields of civil engineering. It continuously develops and improves higher education, scientific and research activities, lifelong learning and cares for the development of civil engineering profession and the application of new technologies. However, the engagement with its stakeholders in this process and the idea to specialise certain disciplines are not well developed or clearly formalised. *The institution has some clearly defined strategy mechanisms, but it is not clear how they work in practice. Therefore it is recommended that the institution define its strategic planning and review that the goals are met in line with its mission.*
- 1.2 Currently the institution has relevant legal documents that set out formally its organisational structure but it lacks clarity. *It is recommended that the institution review the organisational structure with a view to the daily work, in order to achieve greater clarity and provide the most efficient basis for operation in order to fulfil the mission.*
- 1.3 The study programmes offered by the institution are aligned with its mission of providing higher education related to civil engineering. *The panel is satisfied that the Faculty contributes positively to University policies and strategy.*
- 1.4 The institution recognises its distinctiveness as being the only such faculty offering university education at undergraduate, graduate and postgraduate levels in all the fields of civil engineering. However, *the institution has to indicate some academic strong points which distinguish them among other higher civil engineering education institutions.*
- 1.5 Study programmes are partly aligned with the baseline of the Croatian Qualifications Framework *but the learning outcomes should be expressed more properly.*

- 1.6 The institution has implemented systems of quality assurance but the students involvement should be risen. ***It is recommended that the systems for quality assurance and their impact should be strengthened.***
- 1.7 The institution has partly implemented formal mechanisms for the monitoring and improvement of the quality of its teaching. ***It is recommended that the formal systems of regular feedback of quality monitoring as well as key performance indicators are instituted for staff and students.***
- 1.8 The institution lacks of formal mechanisms for monitoring and improvement of the research quality but the research output (quality and quantity of publications etc. are satisfying. ***The panel recommends that mechanism should be more efficient and stronger in order to bring out better academic results.***
- 1.9 The institution has established formal rules and ordinances for the highest level of ethical conduct and so far it has had some experience of putting these into operation.
- 1.10 The staff and the students are not well acquainted with the rules of ethical behaviour according to their answers. ***The panel recommends to inspect the situation and, if necessary, to improve the visibility of the rules of ethical behaviour.***

2) Study Programmes

- 2.1. The enrolment quotas are determined by the needs of the civil engineering industry and by employment opportunities. At present the enrolment quota for graduate studies is higher than the one for undergraduate studies: total of 225 full-time students, of which 190 are Croatian nationals and 35 foreign students (with the possibility of replacing foreign student places with Croatian students). It results from the fact that the labour market is not interested in employing bachelors of civil engineering, and most students continue their education at graduate level. Thus, in academic year 2008-2009 all 87 bachelors from preceding academic year continued education at graduate level, in 2009-2010 out of 178 students 172 continued education (96.6%), and in year 2010-2011 out of 194, 193 enrolled students continued education at graduate level (99.5%). ***The panel finds that the institution analyses the needs and opportunities for employment of civil engineers in a sufficient way.***

- 2.2. ***The panel finds that the institution analyses the pass rate and that the enrolment quotas are in line with the institutional resources.***
- 2.3 Student learning outcomes at the level of a study programme are set by the teachers and are clearly communicated to the students. The students indicated that they are aware of the expected learning outcomes but ***it is recommended that the institution finds more appropriate mechanisms to ensure the quality of exams.***
- 2.4 The teachers have some choice in the ways in which the students' learning is assessed. This relates appropriately to the learning outcomes and partly represents the full range of learning being assessed. ***It is recommended that the institution review its approach to assessment to ensure that the assessment for all learning outcomes is the most appropriate.***
- 2.5 Appropriate arrangements are in place to calculate the allocation of ECTS credits so that it reflects the work load of the students. The students generally understand the arrangements for the allocation of credits although they reported that there was some imbalance in the implementation of the associated workloads. At present the institution does not carry out regular assessment of the appropriateness of the relative credit weightings – ***this should be done.***
- 2.6 The content and quality of each study programme conforms to internationally recognised standards in a way that the qualifications can be internationally recognised. On completion of their programmes the students are provided with a certificate accompanied by a diploma supplement document. ***The panel recommends that some courses (especially on master level) should be delivered in English e.g. separate master.***
- 2.7 A range of different teaching methods is used and all learning materials are available on-line. Students reported the problem of some out-dated material, lack of international case studies and lack of practically relevant exercise. ***It is recommended that the institution reviews the teaching strategies being employed in its programmes to ensure that they are the most appropriate and effective.***
- 2.8 ***The panel is satisfied that the institution made available appropriate amount of supplemental resources, including electronic databases and other sources, which aid knowledge acquisition.***
- 2.9 Students have some opportunities to experience practical applications in internships in study programmes on master level, but the students reported that they wish to have an internship or field work in undergraduate cycle. ***It is***

recommended that the institution provide better opportunities for student practice on bachelor level.

- 2.10 The institution has defined formal processes for the proposal, approval and implementation of new study programmes and has appropriate arrangements in place for the development, innovation and improvements of programmes.

3) Students

- 3.1. The information packages available to potential students clearly inform them about the level of the programmes, qualifications and academic titles as well as possibilities for further education and employment. ***The panel is very satisfied with the information packages made by the institution.***
- 3.2 Based on the *state matura*, the admissions criteria and procedures are publicly stated and consistently applied.
- 3.3 Given that acceptance is based on the *state matura* there is no need for additional criteria to determine acceptance.
- 3.4 The institution supports the students very well in a number of ways in their extra-curricular activities, including sport, cultural and other activities.
- 3.5 The institution offers counselling and mentorship to the students but the students explain that they decide about their specialisation according to their colleagues experience in previous years. ***It is recommended that the institution gives more attention to explaining to the students the support system and encouraging them to use it to their advantage.***
- 3.6 Not applicable.
- 3.7 ***The panel is satisfied that the institution supports the work of the Student Council.***
- 3.8 The institution publishes its methods and procedures for student assessment but the students don't understand the assessment arrangements. ***It is suggested that e.g. formal workshops with teacher/supervisors is used to clarify the procedures for student assessment or that an introduction to assessments methods is a part of every course offered***
- 3.9 Although the institution gains information about employment of graduates from connections with professional associations, the amount of information that the institution has about the employability of its graduates is relatively limited. ***It is***

recommended that the institution strengthens its statistical information relating to employment

- 3.10 ***The panel is satisfied that institution maintains contact with alumni.***
- 3.11. With student membership of the committees of the institution, appropriate opportunities are provided for the students to participate in decision making processes and in the resolution of matters affecting their experience.
- 3.12. ***The panel is satisfied that the*** institution provides information aimed at prospective students and information to the public about its study programmes, learning outcomes, qualifications and employment opportunities.
- 3.13 Opportunities are provided for the students to express their views and to suggest areas for improvement, including through the student membership of number of committees.
- 3.14 The panel finds that the students are informed about the measures implemented on the basis of their suggestions and opinions.

4) Teachers

- 4.1 The qualifications of the teachers are partly adequate as there are many outsourced teachers ***It is recommended that more academic staff are recruited with the necessarily academic qualifications to support teaching and research activity on international level.***
- 4.2 The institution carries out a good policy for the growth and development of human resources.
- 4.3 The student staff ratio is 1:17 but the allocation of time spent in research is can be increased.
- 4.4 As noted in 4.3 the ratio between students and full-time teachers is relatively high for the research institution and for the institution which aims to be national centre of excellence in Civil Engineering.
- 4.5 The institution has not developed policies for its teaching staff and pedagogical training ***so the institution should work on establishing and implement formal policies on teaching staff and pedagogical training.***
- 4.6 The institution's procedures for promotion and other advancement by the teachers are appropriately developed, understood and accepted. They are implemented in a fair and consistent manner and there are opportunities to appeal.

- 4.7 Although it works well, policies governing the assignment of teachers' workloads are only sufficiently developed. ***It is recommended that the institution develop policies governing the assignment of teachers' workloads.***
- 4.8 Some teachers are employed on two places as well as some of junior researchers.

5) Scientific and Professional Activity

- 5.1 Key performance indicators for the monitoring of researchers performance are not well developed. Partly as a result the research output fails to reach the levels expected for a centre of research. ***It is recommended that the institution strengthens and develops the relevant mechanisms to ensure that research activities generally are improved.***
- 5.2 In planning and implementing its research agenda the institution is developing good links in Croatia but cooperation internationally should be improved. ***The institution is recommended to continue in its efforts to realise its plans for national and international academic cooperation.***
- 5.3 While the importance of research is clearly in evidence in the institution's mission and there is a broad awareness among the academic staff of the importance of research, this is not clearly translated into an apparent awareness of the importance of achieving the highest quality outputs.
- 5.4 The panel is satisfied that the institution maintains good arrangements for supporting its young researchers as well as their number.
- 5.5. The institution doesn't use evidence of productivity of its research activities including publications and presentations at conferences and the scientific research of the Faculty is not at present systematically monitored. Also there is little evidence that information is being used in a strategic way to enhance the quality of research by, for example, distinguishing clearly between types of outputs. ***The institution is recommended to take a more strategic approach to indicators of research activity so that they will support the improvements in research quality.***
- 5.6. The institution has some policies of encouraging academic publishing such as national prerequisites for promotion but ***they should be further developed.***
- 5.7. The institution supports the scientific activities of its researchers in line with its mission and it monitors these activities.

- 5.8. The panel is satisfied that institution supports professional activities and services.

6) International Cooperation and Mobility

- 6.1 The institution has inward mobility of students from other Croatian Higher Education Institutions but has lack of mobility from institutions out of Croatia. ***The institution is recommended to encourage and facilitate inward and outward mobility including offering more provision in English language.***
- 6.2 The students have opportunities to take some proportion of their studies abroad. The institution has set up a number of bilateral agreements. ***It is recommended that the institution continues to develop the opportunities for more students to benefit from international experience.***
- 6.3 The Faculty has enabled a number of academic staff and scientific novices to undertake residences to foreign universities. ***It is recommended that the Faculty continues to support e.g. young staff in international cooperation and to support them to implement their experiences in Faculty's activities.***
- 6.4 The Faculty is represented by some of its staff in international scientific and professional associations.
- 6.5 ***It is recommended that the institution moves towards offering a greater proportion of its programmes in English.***
- 6.6 The institution hasn't got activities related to the EU Life Long Learning (LLL) programme.
- 6.7 The institution has participated in a number of inter-institutional projects and it ***is recommended to continue to develop and extend its international links.***

7) Resources, Administration, Space, Equipment and Finance

- 7.1 Although it is mentioned in Self-evaluation Report as a problem, the panel is satisfied that institutional resources for students and staff are good. These include the IT resources and the virtual learning environment which provides access to course information as well as electronic journals. Classroom and practical work rooms have appropriate equipment. The institution also provides group and individual study spaces, library resources and good equipment especially the laboratories.

- 7.2 The institution lacks the clear policies on development of non-teaching staff.
- 7.3 The institution has well-equipped labs and some of them have an accreditation.
- 7.4 The equipment and technical equipment is provided in a manner that is appropriate to its use by students and staff.
- 7.5 The institution collects, analyses and uses information about its activities although this could be available and used in a more systematic way to support programmes of improvement. ***It is recommended that information is obtained and used more systematically as a management tool.*** Also, the panel has noticed that relevant contact with abroad is missing for research ***therefore it is recommended that the institution put more effort in establishing these contacts.***
- 7.6 The library is very well equipped with up-to-date material and it houses the main relevant journals, mostly online. There is an active purchasing programme for the library resources.
- 7.7 Although the institution has mentioned some problems in the self-evaluation report, the panel finds that institution has an appropriate ratio of teaching and non-teaching staff.
- 7.8 Budgetary resources are mostly stable, although the panel has noticed some decrease of income.
- 7.9 During the interviews it was demonstrated that the faculty allocates part of its own resources to improve the quality of teaching and research but the panel finds that formal policies in several areas are missing.

FINAL REPORT AND RECOMMENDATIONS BY THE EXPERT PANEL FOR THE ACCREDITATION COUNCIL

STRONG POINTS

- **The institution gathers good researchers along with their national and international connections and attracts good candidates for study programmes**
- Curricula offered by the faculty is good in content
- Due to tradition the institution supports a lot of areas of civil engineering but on the other hand it is very expensive and the institution should consider focusing on few areas of civil engineering
- The quality and equipment of laboratories is unique on national level

WEAK POINTS

- Although some of researchers have good connections abroad on individual basis the results of such collaboration is not very visible on institutional level
- Lack of use of key performance indicators as the management tool
- for better fostering of internationalization the lecturing in English is needed
- The quality and research interest should be moved toward internationally recognized standards
- Although there is some impressive work in international research teams, still it is based on individual level

GENERAL RECOMMENDATIONS

- It would be very useful to establish an Office for administrative support (and initial money) for scientific projects with an international profile e.g. European funding
- The management Board should establish some incentives to initiate staff to have projects by ensuring some money for traveling, lobbying, etc.
- More focus should be given on areas where the institution can build research excellence
- The faculty should continue with the internalization of the study programs
- It would be recommendable to implement an acknowledgement system of scientific production
- Due to tradition the institution supports a lot of areas of civil engineering but in the but in the other hand it is very expensive and the institution should consider focusing on few areas of civil engineering

RECOMMENDATIONS FOR IMPROVEMENT OF QUALITY

1) Management of the Higher Education Institution and Quality Assurance

- It is recommended that the institution define its strategic planning and review that the goals are met in line with its mission.
- It is recommended that the institution review the organisational structure with a view to the daily work, in order to achieve greater clarity and provide the most efficient basis for operation.
- The panel is satisfied that the Faculty contributes positively to University policies and strategy.
- The institution has to indicate some strong points which distinguish them among other higher civil engineering education institutions.
- The learning outcomes should be expressed more properly.
- It is recommended that the systems for quality assurance and their impact should be strengthened.
- It is recommended that the formal systems of regular feedback of quality monitoring as well as key performance indicators are instituted for staff and students.
- The panel recommends that mechanism for monitoring and improvement of the research quality should be more efficient and stronger in order to bring out better results.

2) Study Programmes

- The panel finds that the institution analyses the needs and opportunities for employment of civil engineers in a sufficient way.
- It is recommended that the institution finds more appropriate mechanisms to ensure the quality of exams.
- It is recommended that the institution review its approach to assessment to ensure that the assessment for all learning outcomes is the most appropriate.
- The panel recommends that some courses (especially on master level) should be delivered in English.
- It is recommended that the institution reviews the teaching strategies being employed in its programmes to ensure that they are the most appropriate and effective.

3) Students

- It is recommended that the institution gives more attention to explaining to the students the support and the *assessment for all learning outcomes is the most appropriate* system and encouraging them to use it to their advantage.
- It is recommended that the institution strengthens its statistical information relating to employment.
- The panel is satisfied that institution maintains contact with alumni.

4) Teachers

- It is recommended that more academic staff is recruited with qualifications to support teaching and research activity. The institution should work on establishing formal policies on teaching staff and pedagogical training.
- It is recommended that the institution develop policies governing the assignment of teachers' workloads.

5) Scientific and Professional Activity

- It is recommended that the institution strengthens and develops the mechanisms to ensure that research activities are improved.
- The institution is recommended to continue in its efforts to realise its plans for national and international cooperation.
- The institution is recommended to take a more strategic approach to indicators of research activity so that they will support the improvements in research quality.

6) International Cooperation and Mobility

- The institution is recommended to encourage and facilitate inward and outward mobility including offering more provision in English language among relevant staff. It is recommended that the institution continues to develop the opportunities for more students to benefit from international experience. It is recommended that the Faculty continues to support staff in international cooperation and to support them to implement their experiences in faculty's activities. It is recommended that the institution moves towards offering a greater proportion of its programmes in English.
- It is recommended to continue to develop and extend its international links.

7) Resources: Administration, Space, Equipment and Finance

- It is recommended that information is obtained and used more systematically as a management tools.
- It is recommended that the institution put more effort in establishing administrative support systems.