# UNIVERSITY OF RIJEKA
## FACULTY OF CIVIL ENGINEERING

**GF**

## POSTGRADUATE DOCTORAL STUDY PROGRAMME IN

## CIVIL ENGINEERING

Rijeka, January 2009

EDUCATIONAL PROGRAMME

# Postgraduate Doctoral Study Programme CIVIL ENGINEERING for award of Ph.D. in Technical Sciences within scientific fields of Civil Engineering and Other Core Technical Scences

Information about the proposal maker:

Faculty of Civil Engineering
Viktora Cara Emina 5, 51000 Rijeka, Croatia
Phone: + 385 51 352 111
Fax: + 385 51 332 816
e-mail: dekanat@gradri.hr
http://www.gradri.hr/

# TABLE OF CONTENTS <span>pg.</span>

# 1.    INTRODUCTION

## 1.1.    REASONS FOR INITIATING THE PROPOSED STUDY PROGRAMME

In the course of the implementation of the Bologna Process, the Faculty of Civil Engineering of the University of Rijeka plans to reform the existing study programmes (scientific, vocational and postgraduate studies) in accordance with the principles of the Bologna Declaration from 1999, the Berlin Communiqué from 2003, and the European Credit Transfer System (ECTS) postulates, all with a purpose of promoting student mobility in the unique European knowledge community.

**The Faculty has adopted a three-cycle study scheme (3+2+3)**:

- *A three-year scientific pregraduate study programme in civil engineering*
- *A two-year scientific graduate study programme in civil engineering*
- *A three-year scientific postgraduate study programme in civil engineering*

The structure of the postgraduate doctoral study programme was adopted at the session of the Council of Science and Education of the Faculty of Civil Engineering in December 2004.

In the process of designing the proposed study programme, the Faculty has relied on the previous experiences in educating civil engineers. The labour market demands and the estimated requirements that will be imposed on the future students, the Faculty, its employees, and the experts in civil engineering in the framework of the process of integrating the Croatian education system in the European knowledge-based society have been taken into consideration as well. The facts that the Faculty of Civil Engineering of the University of Rijeka is the only higher education institution offering study programmes in civil engineering in the wider geographical area (Primorsko-goranska County, Istrian County, Ličko-senjska County) and that after the decree of the Ministry of Science, Education and the Sports as of 26. January 2006 the faculty has been fully licenced to conduct promotion and award scientific titles in the fields of Civil Engineering and Other Core Technical Sciences, have also been respected.

Due to current intensive activities in the field of planning, designing and construction of infrastructural elements (roads, residential complexes, water-supply systems, and similar), there arose a need for highly qualified civil engineers. The statistics show that there are in principle **no unemployed civil engineers with scientific or vocational degrees** at the Croatian Bureau of Unemployment. Such intensive activities in the field of civil engineering, especially in the domain of infrastructural projects, reveal the obvious need for civil engineers with modern scientific knowledge, qualified not only to independently undertake scientific research projects, but also to contribute to the scientific thought in the scientific fields of Civil Engineering and Other Core Technical Sciences, in particular in the scientific branches of Hydraulics, Geotechnics, Structures, Materials, and Mechanics of Rigid and Deformable Bodies. Given the scientific advances in these branches, it is impossible to acquire new knowledge separately, and there exists considerable interest for a systematic approach to these knowledge, something aimed to be achieved with the proposed doctoral study programme.

The objective of the proposed postgraduate doctoral study programme in civil engineering is to educate and build professional experts who would help speed up the process of translating scientifically based technological solutions into engineering practice, and be active in scientific research activities. In doing so, the Faculty, as part of the University of Rijeka, would give its contribution to the realization of the Lisbon Strategy from 2000, namely turning Europe into the "most competitive and most dynamic knowledge-based economy in the world" by 2010.

Given that the Faculty of Civil Engineering has had this doctoral programe preliminarily approved by the University of Rijeka in accordance with the regulations from the Ministry of Scence, Education and the Sport for the academic year 2005/2006, it is interesting to summarize some of the experiences and highlight them in the context of the actual need for the proposed study programme. A considerable interest was witnessed on the part of the candidates whose main objective was not to build an academic career, but rather to acquire and further develop new knowledge and scientific methodology in the context of practical application, of which cca 80% had graduated during the past three years. As much as cca 70% of the candidates came from industry, and among the student to whom the enrolment to the programme was offered, such students made up a total of 50%.

One of the parts of study provided in the framework of the proposed postgraduate study programme in civil engineering, Hydraulics of litoral areas, puts special emphasis on the characteristics of the North Adriatic region and the development of the region-related, region-specific competences in the future doctoral students. The entire study programme is enriched through the cooperation with top-notch home and international professional experts on the basis of cooperation agreements between the Faculty and their respective parent institutions. The orientation to focus the proposed study programme partly on the specific areas of interest for the wider surroundings where the University and the Faculty operate, in particular where it concerns the problems of hydraulics of litoral areas and geotechnical modelling, has been chosen deliberately. The continually growing processes and problems of litoralization, especially pronounced in the mediterranean coastal areas, also dictate the continually expanding demands to treat these problems in a scientifically sound manner.

It is important to emphasize that a start-up of the proposed study programme is a necessity of the Faculty as a member of the University which, according to its mission statement conducts scientific, artistic and developmental research with particular emphasis on the strategic interests of the Republic of Croatia including the undergraduate, graduate and post-graduate education based on these demands.

Furthermore, the University of Rijeka has a vision of a research-oriented university with a clearly defined research profile aimed at susainable development, which conducts high-quality and effective education based on learning outcomes and the life-long learning concept, which has been emphasized within the 1. strategic objective of the document "Strategy 2007-2013 of the University of Rijeka". In this document, particular emphasis has been placed on the expectations that the continuation of the work of the Faculty in the new University Campus building, something planned to take place in the first phase of the Campus set-up, shall result in a considerable improvement of the quality of research and education in Civil Engineering. By startig the proposed study programme, the Faculty also acts in accordance to the 2. strategic objective of "Stategy 2007-2013", which aims at doubling the scientific production and accepts the corresponding tasks that relate to incresing the number of PhD theses, number of scientific papers published in the journals quoted in Science Citation Index database, and the number of PhD supervisors.

The future doctors of technical sciences are needed not only for the present needs, but also for the demands of the future development of the surrounding region. In order to facilitate the transfer of knowledge, one of the aims of the Faculty of Civil Engineering has always been to educate a number of its staff elsewhere and, accordingly, the faculty expects that the proposed study programe with its specific profile may also be of interest to other higher-education institutions.

## 1.2.    PREVIOUS EXPERIENCES OF THE PROPOSAL MAKER IN DELIVERY OF DOCTORAL AND OTHER POSTGRADUATE STUDY PROGRAMMES

The Faculty of Civil Engineering of the University of Rijeka introduced a study programme in civil engineering in 1976. Over the past 30 years **1094** students graduated from the Faculty earning a

scientific degree and **1344** earning a vocational degree in civil engineering. Since the academic year 1998/1999, the Faculty of Civil Engineering of the University of Rijeka also offers a postgraduate scientific study programme in civil engineering (Mechanics of Structures), after the completion of which the students earn **a master's degree in technical sciences**. So far 33 students have enrolled in the programme. Although the Faculty, as an institution, has not offered or delivered a postgraduate doctoral study programme so far, a large number of the Faculty's employees have, directly or indirectly, already been engaged in similar study programmes organized at other institutions in the role of course lecturers, supervisors and doctoral dissertation evaluation committee members. The Faculty of Civil Engineering of the University of Rijeka numbers eighteen professors/scientists, all of whom are actively involved in scientific research activities and have in the past fifteen years collectively published more than 70 scientific research articles in journals listed in the Science Citation Index Expanded database (wos.irb.hr), of which more than 60 have also been quoted in the database Current Contents (http://bib.irb.hr/lista-radova?sif_ust=114).

## 1.3.    OPENNESS OF THE PROPOSED STUDY PROGRAMME TOWARDS STUDENT MOBILITY

In the process of designing the educational programmes, the Faculty has actively cooperated with the related faculties of civil engineering in Croatia and Slovenia, and taken into consideration the experiences of other faculties, mainly European ones. The basic elements of the proposed postgraduate doctoral study programme, especially those concerning the allocation of credits to various study activities according to the European Credit Transfer System, correspond to a significant degree to the new doctoral study programmes introduced at other faculties of civil engineering in the country with the purpose of enabling and promoting student mobility at the national level first. Pursuant to the relevant provisions of the University of Rijeka Study Regulations, the proposed postgraduate doctoral study programme elaborates the demand for student study visits to other home or international university and scientific institutions with the purpose of stimulating the mobility of doctoral students in the best possible way. The Faculty of Civil Engineering of the University of Rijeka has established cooperation in scientific research activities with the related faculties within the country that is regulated on the basis of cooperation agreements through contacts with the branches of the Institute of Civil Engineering in Zagreb and Rijeka. Prompted by the need to enable its doctoral students to visit other home and international institutions, the Faculty of Civil Engineering of the University of Rijeka established cooperation with the Faculty of Civil Engineering and Geodesy of the University of Ljubljana signing a Cooperation Agreement as the basis for a doctoral student exchange program. With this institution, as well as with the Technical Faculty of the University of Rijeka and the Faculty of Civil Engineering of the University of Zagreb, an agreement has been reached, which enables the doctoral students enrolled at tje proposed study programme to select a number of optional courses at the corresponding doctoral study programmes at these institutions.

## 1.4.    POSSIBILITY OF INCLUDING THE PROPOSED STUDY PROGRAMME IN THE JOINT STUDY PROGRAMME WITH FOREIGN COUNTRIES

The initiation of a joint postgraduate study programme in cooperation with foreign universities has not been envisaged in the framework of the existing phase. However, the proposed study programme does involve international professional experts, which creates an opportunity for intensification of international cooperation in scientific research activities and possible initiation of such a study programme in the future. Also, there are higer-educatin institutions, including a foreign one, with which there exist an agreement to select a number of optional courses from their doctoral study programmes.

## 1.5.    OTHER ELEMENTS AND NECESSARY INFORMATION

An effort to respond to the need for a closer interaction between the institutions of higher education and economy is evident in the proposed study programme from a series of technological projects that are conducted at the Faculty, and from directly arranged research and development projects between the Faculty and the business sector. On the basis of the afore-mentioned locally specific element of the newly proposed postgraduate doctoral study programme, the Faculty considers such cooperation one of its strategic priorities.

In the creation of the program, the educational programmes of reputable international institutions offering doctoral studies in related fields were reviewed (Swiss Federal Institute of Technology, Zurich, Department of Civil Engineering; Stanford University, Department of Civil and Environmental Engineering; University of Cambridge, Department of Engineering; Chalmers Institute of Technology, Goeteburg; University of Maryland; University of Colorado at Boulder). The experiences of the employees of the Faculty of Civil Engineering of the University of Rijeka acquired at other universities (University of Split, University of Zagreb, University of Maribor, University of Ljubljana, Swiss Federal Institute of Technology - Lausanne, University of Lancaster, Institute of Construction Materials - Stuttgart, Imperial College London) have also been taken into consideration in the preparation of the programme.

The recommendations of the European Civil Engineering Education and Training Association have also been taken into account through coordination activities conducted in the framework of the TEMPUS project entitled Restructuring and Updating of Civil Engineering Curriculum (through active involvement of all four Croatian faculties of civil engineering as well as international experts and scientists).

Special regard has been given to the recommendations of the European University Association set out in the conclusions from the Bologna Seminar entitled Doctoral Programs for the European Knowledge Society held in Salzburg from February 3-5, 2005, as well as in the declaration entitled Strong Universities for a Strong Europe adopted in April 2005 in Glasgow at the conference organized by the Higher Education Association, and the conclusions from the ministerial conference entitled European Higher Education Area – Achieving the Goals held in Bergen in May 2005.

Finally, the proposed study programme has been prepared in accordance with the following acts:

Law of research activity and higher education:

http://www.nn.hr/clanci/sluzbeno/2003/1742.htm

Regulations for the award of scientific titles:

http://www.nn.hr/clanci/sluzbeno/2005/1633.htm

Strategy 2007-2013, Statute and the Study Regulations of the University of Rijeka:

http://www.uniri.hr/component/option,com_wrapper/Itemid,150/

Recommendations for assembling the proposals of postgraduate study programmes of the Rectors' Choir of 8.2.2005:

http://www.uniri.hr/hr/studiji/Propisi%20i%20pravilnici/Upute%20za%20sastavljanje%20prijedloga%20poslijediplomskih%20studijskih%20programa.doc

Suggestions for setting-up the postgraduate doctoral study programmes ofthe National Council for Higher Education of 13.7.2006:

http://www.uniri.hr/hr/studiji/Propisi%20i%20pravilnici/Preporuka%20o%20ustrojavanju%20poslijediplomskih%20doktorskih%20studija.pdf

Principles for setting-up the postgraduate doctoral study programmes ofthe National Council for Higher Education of 14.7.2006:

http://www.uniri.hr/hr/studiji/Propisi%20i%20pravilnici/Nacela%20za%20uspostavu%20poslijediplomskih%20doktorskih%20studija.doc

# 2.   GENERAL INFORMATION

## 2.1.   TITLE OF THE PROPOSED STUDY PROGRAMME

The Faculty of Civil Engineering of the University of Rijeka plans to introduce a **postgraduate doctoral study programme** entitled "Civil Engineering" in the scientific field of **Civil Engineering (2.05)** and **Other Core Sciences (2.15)** in the framework of the generic scientific field of **Technical Sciences**. The study programme is organized within the subject areas that cover **Geotechnics (2.05.01), Load-bearing Structures (2.05.02), Hydraulics (2.05.03), Materials (2.15.03), Fluid Mechanics (2.15.04),** and **Engineering Mechanics (mechanics of solid and deformable bodies) (2.15.06).**

## 2.2.   PROVIDER AND DELIVERER OF THE PROPOSED STUDY PROGRAMME

The provider and the envisaged deliverer of the proposed programme is the Faculty of Civil Engineering of the University of Rijeka with its core educational units: Department of Geotechnics, Department of Hydrotechnics, Institute of Computational Modeling of Material and Structures, Department of Load-bearing Structures, Department of Construction Organization and Architecture, Department of Traffic, Department of Technical Mechanics, Department of Mathematics, and Department of Physics and Other Subjects.

## 2.3.   INSTITUTIONAL STRATEGY FOR DEVELOPMENT OF DOCTORAL PROGRAMMES

### 2.3.1 Objectives and goals of the doctoral study programme

The general objectives and goals of the proposed postgraduate doctoral study programme are education and development of researchers for whom there is a great demand in the society and who will be qualified to a) independently conduct research activities in accordance with the internationally accepted quality standards, b) actively contribute to the development of a humane and sustainable society, and c) transfer the acquired knowledge to future generations of students as well as present it to the general public.

The proposed study programme is designed to help doctoral students develop the following skills and abilities:

1. To conduct research using scientific methodology.
2. To conduct research in the spirit of the generally accepted research ethics.
3. To make critical evaluations of their own research activities as well as those of others.
4. To conduct interdisciplinary activities and apply the results in the context different from that in which they were obtained.
5. To transfer knowledge in a pedagogic way.
6. To manage research activities.

The proposal maker intends to achieve the above-mentioned objectives and goals offering the students a precisely structured educational programme which includes compulsory courses that provide the students with a solid scientific background, opportunities for engaging in research activities at the level of international competition with the help of qualified supervisors, and the possibility of developing skills necessary to transfer the acquired knowledge through possible engagements in scientific study programmes, taking part in scientific research and educational seminars organized by the Faculty, and participating at home and international conferences.

The main objective of the proposed **postgraduate doctoral study programme** is to provide the students with efficient education on the basis of the proposed educational and research activities, including the expansion of their existing knowledge, skills and expertise through conducting original scientific research activities. Such activities must meet the internationally accepted quality standards and contribute significantly to the development of the scientific thought within one of the fields of research available at the Faculty. For that reason, monitoring of the quality of the postgraduate doctoral study programme is of key importance and shall be conducted through various forms of evaluation and self-evaluation of professors, students and related services, through institutional monitoring of the implementation and delivery of the study programme, and by accepting objective quality measuring methods explained in more detail in Sections 3.4.3 and 4.11.

### 2.3.2. Intensification of scientific research activity

The Faculty of Civil Engineering of the University of Rijeka has signed cooperation agreements and fosters long-time scientific and educational cooperation with the leading scientific research institutions in the Republic of Croatia (Croatian Institute of Civil Engineering, Institute of Geologic Research). Furthermore, the Faculty intends to officially regulate and intensify the existing cooperation with other state institutions (Croatian Waters, State Institute of Hydrometeorology, and other), but also with institutions of similar interests within other universities (other faculties of civil engineering, Faculty of Agronomy, Faculty of Mining and Geology, and other), all with a purpose to share human and material resources for the development of scientific research activity as the basic prerequisite for functioning and development of the doctoral study programme. In addition to Croatian institutions and in terms of exchanging experiences, knowledge and researcher workers the existing international cooperation with scientific research institutions across the world (Karst Research Institute, Postojna; University of Zurich, University of Stuttgart, University of Graz, and other) will also be intensified. This would bring access to new fields of research, an increase in the number of seminar and doctoral dissertation topics, as well as the mobility of students and researcher workers, and result in raising the quality of scientific research activities within the Faculty.

By introducing the doctoral study programme, the Faculty shall expand the core of future scientific research activities by educating its own staff (current scientific novices), and, in doing so, enrich the teaching staff, initiate new scientific research projects, and consequently include a larger number of qualified young people in the realization of the same.

### 2.3.3. Specialist postgraduate study programme

On the basis of the existing scientific undergraduate study programmes and in terms of the further development and enhancement of specialist knowledge in the case of interested students, and the further education based on new scientific ideas applicable in practice, the Faculty plans to offer specialist postgraduate study programmes as well. The need for introducing specialist study programmes by the Faculty of Civil Engineering of the University of Rijeka as the programme provider and deliverer has already been perceived (for example, a specialist programme in Construction Business and Environment, Urban Engineering). In the case of multi-disciplinary studies such as Construction Business Management, the Faculty would deliver the same in cooperation with other faculties within the University (for example, the Faculty of Economics) or external faculties. The need for and the particular field of study of the specialist programme would be based on the market demands.

## 2.4.    INNOVATIVENESS OF THE DOCTORAL PROGRAMME

The proposed doctoral study programme offers the students a possibility of specific study within three different subject areas. The goal of the proposed doctoral study programme is to offer the students flexibility in creating individual study obligations package and, in doing so, recognize the diversity of students' experiences and approaches. The subject areas of study are described in Sections 3.1-3.4.

Besides the Faculty's staff, numerous home and international visiting experts from the University of Split, University of Zagreb, University of Maribor, University of Ljubljana, and University of Lancaster shall be engaged in the delivery of the doctoral programme in both major fields of study.

The doctoral study programme is based on research projects financed by the Ministry of Science, Education and Sports, development projects conducted by the Faculty, and projects based on the cooperation between the Faculty and the business sector. The list of projects is given in Section 4.3.

## 2.5.    ENROLMENT REQUIREMENTS

All Croatian citizens, international citizens, and persons without citizenship are eligible to apply for the study programme under the same terms and conditions. The application process for enrolling in the doctoral study programme is conducted on the basis of a public tender announced by the Faculty Council six months before the beginning of the programme.

To apply for the postgraduate doctoral study programme, the candidate must have a graduate degree from a faculty of civil engineering, whereby they have earned at least 300 ECTS including the undergraduate cycle, or a different university graduate study if the amount of learning outcomes from the field of other core technical sceinces obtained there is comparable to the corresponding amount obtqained from the civil engineering graduate degrees, which is decided by the Postgraduate Studies Committee from the diploma supplement.

To apply for the postgraduate doctoral study programme, the candidate may also have a graduate degree from a different scientific field of Technical Sciences, as well as from the scientific aea of Natural Sceinces. Based on the learning outcomes (decided upon on the basis of the diploma supplement), the Postgraduate Studies Committee may decide to include a number of suitable Civil Engineering  graduate courses in the postgraduate study plan for these students.

The candidates with the bachelor of science degree who earned their degree on the basis of the study programmes delivered before the reform of the higher education system of 2005 are also eligible to apply for the doctoral programme under the same conditions. If it can be found that such candidates have acquired any additional knowledge or skills by publishing scientific works or attending special courses and taking exams in the framework of the postgraduate master's study programmes delivered or started before the reform of the higher education system of 2005, and they satisfy the enrolment requirements for the proposed postgraduate doctoral study programme, they may be granted up to 30 credits upon enrolment, depending on the acquired competences. The exact number of credits deemed equivalent to a bachelor's degree and additional qualifications of the candidate are determined by the Faculty Council for each candidate separately.

The candidates with a master of science degree in technical sciences earned on the basis of the study programmes delivered before the reforms of the higher education system of 2005 are also eligible to apply. Upon recommendation of the Doctoral Studies Committee the Faculty Council may grant such a

candidate up to ECTS 42 in lieu of taking exams. If the candidate has earned their master's degree from a scientific field other than Civil Engineering or Other Core Technical Sciences, the Postgraduate Studies Committee may decide to include a number of suitable Civil Engineering graduate courses in the postgraduate study plan for these students. The acquired competences for sch students are decided upon from the master's study course transcript.

To apply for the postgraduate doctoral study programme, the candidate should have a prescribed minimum grade average from the education programme they have completed and a recommendation of at least one university professor who is familiar with the academic achievements of such candidate is also eligible to apply. When submitting the application for enrolment the candidates must state the names of the proposed supervisor and co-supervisor, and whether he/she is applying for the full-time or half-time study programme.

Candidates that have made scientific achievements that are equivalent to the conditions required for the scientific election and which conform to Article 61 of the University of Rijeka Study Regulations may be freed from the obligation to take the exams upon a decision of the Faculty Council confirmed by the University Senate.

## 2.6. CRITERIA AND PROCEDURES FOR THE SELECTION OF CANDIDATES

The selection of candidates for the postgraduate doctoral study programme is done on the basis of the following indicators:

1. Academic achievement at the previous level of study (current pregraduate study programmes or undergraduate study programmes delivered before the reform of the higher education system of 2005).
2. Master's or bachelor's dissertation grade in the case of those candidates who have a bachelor's degree in engineering earned on the basis of undergraduate study programmes delivered before the reform of the higher education system of 2005.
3. Master's or bachelor's dissertation defence grade in the case of candidates who have a bachelor's degree in engineering earned on the basis of undergraduate study programmes delivered before the reform of the higher education system of 2005.
4. ~~Number of credits granted on the basis of~~ acquired competences as described in Section 2.5 including the candidate's research activity
5. Student awards and recognitions ~~(except for those on the basis of which the student has been granted a certain number of credits),~~ student and teaching activities
6. Recommendations of supervisors who helped the candidates in the process of writing their master's or bachelor's dissertations in the case of those candidates who have a bachelor's degree in engineering earned on the basis of undergraduate study programmes delivered before the reform of the higher education system of 2005, or recommendations of other *scientists* familiar with the qualifications and achievements of the student.
7. Presentation of the candidate before the Postgraduate Studies Committee that can include a test of knowledge in the related studies or a language skills test (English or other world languages).
8. Interest of the candidate in the full-time study programme (in the case two candidates have the same qualifications, the one who can commit to a full-time study programme shall have priority).

The self-financing candidates who satisfy the requirements for being accepted in the postgraduate doctoral study programme sign a Self-financed Study Contract that regulates the mutual rights and obligations between the student and the Faculty.

## 2.7 LEARNING OUTCOMES (COMPETENCES AND QUALIFICATIONS ACQUIRED BY STUDENTS UPON COMPLETION OF THE STUDY PROGRAMME)

The main goal of the proposed **doctoral study programme** is to provide the students with efficient education through conducting original scientific research activities. Upon the completion of the study programme the students earn **a doctoral degree in technical sciences** and are qualified to make critical analyses, evaluations and syntheses of the new and complex concepts, and develop new methodological procedures in the scientific fields of geotechnics, hydrotechnics, load-bearing structures, technical mechanics, and fluid mechanics. After the completion of the study programme, the students are also qualified to independently conduct advanced scientific research and specialist activities related to modelling, calculating, analysing and designing of systems within these scientific fields. These competences include the development of skills and knowledge needed to solve specific problems using an interdisciplinary approach, especially in the context of interrelationships between different construction operations, systems and their environments. By acquiring deeper, more advanced knowledge of particular scientific disciplines, the students will be able to develop on their own and improve these disciplines through research, planning, designing, executing and managing the most complex construction operations and related systems.

An additional objective of the doctoral study programme is to develop or enhance the ability of students to present their work, lead a debate providing logical argumentation in regards to positive scientific facts (related to information, problems and possible solutions) to the professional and non-professional audience by ensuring various adequate elements. In this way, the students become qualified to promote technological progress to scholars and professionals in a knowledge-based society. After completing the study programme the students have all the necessary skills and competences to work independently within the academic community.

# 3.  DESCRIPTION OF THE PROPOSED STUDY PROGRAMME

## 3.1.  STRUCTURE AND ORGANIZATION OF THE DOCTORAL STUDY PROGRAMME

The students can attend a full-time or half-time doctoral study programme. In both cases the study programme consists of the same study obligations (coursework and other activities); the only difference is in the time required to complete the programme. The study programme lasts six semesters, during which time the students acquire 180 credits if they complete all their study obligations successfully. With the full-time study, the semesters are principally linked to the academic years in the sense that each academic year consists of two semesters. With the part-time study, the semesters are not linked to the academic years and the student is free to adapt the rhythm of studying according to their other obligations. The course part of the study programme is realized through the selection of courses from the following subject areas:

- Hydraulics of litoral areas,
- Modelling in geotechnics,
- Mechanics of structures.

The study obligations are divided in three categories:

1) **Taught (educational) study obligations** (T) – attendance of compulsory and optional courses and taking exams on the basis of which the students earn at least 48 credits, including

   1.1)     Attending lectures and taking exams in the core courses within the chosen subject area (T1) on the basis of which the students earn 30 credits;
   1.2)     Fulfilling study obligations related to optional courses in the chosen field of study (T2) on the basis of which the students earn at least 18 credits.

2) **Research activities**, on the basis of which the students earn at least 120 credits.

   2.1) **Additional study obligations in teaching and knowledge transfer** on the basis of which during the course of the study the students earn at least 12 credits.

The following table shows the schedule of educatinoal and research study obligations by semesters.

| SEMESTER | STUDY OBLIGATIONS | | ECTS | |
|---|---|---|---|---|
| I | Educational  obligations T1  (core  courses) | | 30 | |
| II | Research activities | Educational  obligations T2  (optional courses) | 12 | 18 |
| III | Research activities | Additional study obligations in teaching and knowledge transfer | 27 | 12 |
| IV | Research activities | | 27 | |
| V | Research activities | | 27 | |
| VI | Research activities | | 27 | |

Additional study obligations in teaching and knowledge transfer have been evenly spread throughout the last four study semesters, but the student can fulfil these obligation at any time during the course of their studies.

During the **first semester** the students are introduced to the theoretical basics essential to the chosen subject area (T1). The core courses within the subject areas are listed in **Section 3.2**. Their programmes are given in **Section 3.4**.

During the **second semester** the students are active in the following categories:

a)    Taking optional courses (T2) – see **Section 3.2.**
b)    Research leading up to the selection of the doctoral dissertation topic

During the **third semester** the student starts with the doctoral dissertation research activities, the topic of which must be registered and publicly defended during the semester in order to be accepted by the Faculty Council at the end of the semester. During the **fourth, fifth and sixth semesters** the student dedicate their time fully to doctoral dissertation research activities, including the process of writing it up. The procedure is explained in more detail in Sections **3.5, 3.6** and **3.10**.

During the course of the study the student is also active in different forms of teasching and knowledge transfer – see Section 3.3.

From the total number of credits required to complete the study programme successfully, at least 20 credits must be earned by fulfilling taught or additional study obligations or performing research activities during study visits to university or scientific institutions outside the University of Rijeka. The student fulfils this obligation in consultation with their supervisor. Such study visits are organized by the supervisor and the Vice-Dean for Postgraduate Studies.

Unless such activity should obstruct the logical sequence of the study programme or violate the University of Rijeka Study Regulations, the study obligations prescribed for a particular semester may be fulfilled during a different semester.

## 3.2.    LIST OF COMPULSORY AND OPTIONAL COURSES

The curriculum of the doctorate study programme consists of the compulsory core and optional components.

During the **first semester** the students are introduced to the theoretical basics essential to the chosen subject area on the basis of **the common and compulsory core courses** (T1). To successfully complete these courses, the students must pass an exam in a manner prescribed by the course programme.

During the **second semester** the student chooses **three optional courses** (T2) available within their chosen field of study, each of which is equivalent to **6 credits**. These courses offer the students a range of various subjects from which the students, in consultation with the course lecturer, choose one or more and study them in detail in the form of seminar work that is publicly presented. One or more optional courses (up to a mximum ECTS value of 18) the student may choose from a suitable doctoral study at a different institution. The institutions with which such an agreement already exists are listed in Section 3.7.

**A student can register for more than three optional courses if in agreement with their counsellor they coclude that registering for additional optional subjects would not obstruct the fulfilment of other study obligations.**

### 3.2.1.  List of compulsory common courses

| Number | Semester | Code | Status | Course | ECTS |
|---|---|---|---|---|---|
| 1. | I | FD-691 | compulsory | Methodology of science and research | 3 |
| 2. | I | M-671 | compulsory | Applied higher mathematics | 6 |
| 3. | I | MK-621 | compulsory | Numerical methods in engineering | 9 |

### 3.2.2.  List of compulsory and optional courses in the subject area HYDRAULICS OF LITORAL AREAS

| Number | Semester* | Code | Status | Course | ECTS |
|---|---|---|---|---|---|
| 1. | I | H-611 | compulsory | Analysis and modelling of hydrological processes | 12 |
| 2. | II | H-612 | optional | Modelling of hydrodynamic and transport processes in marine environment* | 6 |
| 3 | II | H-613 | optional | Coastal processes and engineering* | 6 |
| 4. | II | H-614 | optional | Principles and application of remote sensing | 6 |
| 5. | II | H-615 | optional | Karst hydrology | 6 |
| 6. | II | H-616 | optional | Management of hydromelioration systems | 6 |
| 7. | II | H-617 | optional | Modelling of aquatic ecosystems* | 6 |
| 8. | II | H-618 | optional | Contemporary approaches to water resources management | 6 |
| 9. | II | H-619 | optional | Eco-hydrology* | 6 |

\*      Courses entirely or partly taught by visiting professors.

**Within the subject area HYDRAULICS OF LITORAL AREAS the program envisages:**

**- 1 compulsory course**
**- 8 optional courses**

### 3.2.3.  List of compulsory and optional courses in the subject area MODELLING IN GEOTECHNICS

| Number | Semester* | Code | Status | Course | ECTS |
|---|---|---|---|---|---|
| 1. | I | G-601 | compulsory | Advanced theoretical soil mechanics | 12 |
| 2. | II | G-602 | optional | Geotechnical modelling | 6 |
| 3 | II | G-603 | optional | Soil consolidation and creep* | 6 |
| 4. | II | G-604 | optional | Advanced rock mechanics | 6 |
| 5. | II | G-605 | optional | Observational methods in geotechnical engineering | 6 |
| 6. | II | G-606 | optional | Geotechnical aspects of waste disposal | 6 |
| 7. | II | G-607 | optional | Geotechnical aspects of earthquake engineering | 6 |
| 8. | II | G-608 | optional | Hazards in geotechnical engineering | 6 |

\*      Courses entirely or partly taught by visiting professors.

**Within the subject area MODELLING IN GEOTECHNICS the program envisages:**

**- 1 compulsory course**
**- 7 optional courses**

### 3.2.4. List of compulsory and optional courses in the subject area MECHANICS OF STRUCTURES

| Number | Semester | Code | Status | Course | ECTS |
|---|---|---|---|---|---|
| **1.** | I | **TM-641** | compulsory | **Fundamentals of non-linear mechanics** | **12** |
| **2.** | II | TM-642 | optional | Algorithmic preservation of mechanical properties | 6 |
| **3.** | II | TM-643 | optional | Meshless numerical methods | 6 |
| 4. | II | TM-644 | optional | Plates and shells* | 6 |
| 5. | II | TM-645 | optional | Structural reliability* | 6 |
| 6. | II | MK-622 | optional | Transport processes in concrete | 6 |
| 7. | II | MK-623 | optional | Mechanics of quasi-brittle materials | 6 |
| 8. | II | MK-624 | optional | Fracture mechanics* | 6 |
| 9. | II | MK-625 | optional | Modelling of structures | 6 |
| 10. | II | MK-626 | optional | Earthquake engineering | 6 |
| 11. | II | NK-631 | optional | Analysis and improvement of timber structures | 6 |
| 12. | II | NK-632 | optional | Dynamics of bridges | 6 |
| 13. | II | NK-633 | izborni | Bearing and usability models for corrosion-affected concrete structures | 6 |
| 14. | II | NK-634 | izborni | Structural damage assessment using nondestructive methods | 6 |

\*    Courses entirely or partly taught by visiting professors.

**Within the subject area MECHANICS OF STRUCTURES the program envisages:**

**- 1 compulsory courses**
**- 13 optional courses**

## 3.3.    COMPULSORY AND OPTIONAL ACTIVITIES

The aim of the propsed study programme is to enable the student to produce an original and independent scientific work – dissertation. During the course of the research, the student must pass through the following phases:

- preparation and registration of the subject of the dissertation, which is granted with **15 credits**
- public defence of the dissertation subject, which is granted with **5 credits**
- preparation and registration of the dissertation, which is granted with **40 credits**
- acceptance of a pass grade for the dissertation by the Faculty Council, which is granted with **10 credits**
- work on and a publication of an original scientific paper in a foreign scientific periodical indexed in Current Contents, Science Citation Index ili Science Citation Index Expanded with the student as the main author, which is granted with **30 credits**
- public defence of the dissertation, which is granted with **10 credits**

Additionally, the student fulfils their study obligations in research by conducting some of the following activities:

- research work which results in an article to be published in a Proceedings from a domestic conference or the Faculty, whereby the student earns **3 credits** per study or a maximum of **6 credits**,

- presentation of the article published in the Proceedngs from a domestic conference at the conference and in the framework of the series of weekly scientific gatherings organized by the Faculty on the basis of which the student earns **2 credits** per presentation or a maximum of **4 credits**,
- research work which results in a **D category** article (see Appendix B) on the basis of which the student earns **4 credits** per study or a maximum of **8 credits**,
- presentation of the article published in the Proceedings from an international conference at the conference and in the framework of the series of weekly scientific gatherings organized by the Faculty in English on the basis of which the student earns **4 credits** or a maximum of **8 credits**,
- research work which results in a refereed **C category** article (see Appendix B) on the basis of which the student earns **5 credits** per study or a maximum of **10 credits**,
- research work which results in a **B category** article (see Appendix B) on the basis of which the student earns **10 credits**,
- research work which results in a **A category** article (see Appendix C) on the basis of which the student earns **30 credits**.

The compulsory and optional research activities must result in at least 120 ECTS credits.

Apart from the taught courses and research work, the student is also engaged in various forms of teaching and knowledge transfer with the value of at least **12 credits** such as:

- Teaching courses in the framework of the scientific undergraduate or graduate studies on the basis of which the student earns credits on the principle that **1 credit equals 20 hours of active involvement in teaching**, whereby the sum of the credits earned cannot exceed **10 credits**,
- Holding presentations within the framework of the series of educational gatherings organized by the Faculty after participating in one of the one-day workshops organized by the University on the subject of improving educational competences on the basis of which the student earns **1 credit** for each participation followed by a presentation up to a maximum of **3 credits,**
- Holding one-time presentations in the framework of the series of educational gatherings organized by the Faculty on one of the subjects of courses the student is actively involved in as an associate, through which the student presents possible improvements to the education process or proposes introduction of new methods of teaching, and earns **2 credits,**
- Active involvement in the popularisation of civil engineering profession through participating at various related events that include lectures or presentations after which the student gives a presentation in the framework of the series of educational or scientific gatherings organized by the Faculty earning **2 credits** for each participation up to a maximum of **4 credits**,
- Participation in workshops related to teaching quality improvement (the student obtains a certificate containing the number of hours of involvement) on the basis of which the student earns credits on the principle that **1 credit equals a workload of 20 hours**, whereby the sum of credits cannot exceed 4 **credits,**
- Holding one-time presentations in the framework of the series of educational gatherings organized by the Faculty through which the half-time students present the activity and the functioning of their professional organizations with a special emphasis on the position of doctoral students and the measures used by the professional organization in question to stimulate their scientific and research advancement, and earn **2 credits.**

## 3.4.    COURSE DESCRIPTIONS

The method of monitoring the quality and efficiency of the course delivery is presented in Section 3.4.3. for all the courses.

**Note:** The number of envisaged hours refers to the professors' workload.

### 3.4.1.  List of compulsory and optional courses

The courses are divided into **core courses** taught during the first semester and equal the total value of 30 credits and optional **courses** within the chosen subject area available in the second semester in the value of 6 credits. In the case of optional courses, the listed subjects in the section entitled Course Subjects reflect the research interests of the course lecturer and present the possible working titles of the future dissertations.

| Course: Methodology of science and research | **Status:** optional | **Code: FD-691** |
|---|---|---|

**Lecturer: Julijan Dobrinić**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | | | | |
| ECTS distribution | 0.5 | | 2 | 0.5 | | | |

**ECTS total: 3**

| Course objectives | Development of generic abilities and skills in validation of new results and achievements on the basis of scientific and research methodology. |
|---|---|
| Topics | Theory of science: definition, development, relationship between science and technology, tendencies of development of contemporary science. Division of science. Scientific categories. Scientific activity: scientific research: experimental research, theoretical research, relationships between them. Methodology of science and research: definition and division of scientific methoda. Technology of research. Dissemination of scientific results: written works, types and value. Science and research in economy and industry. Science and research in academia. |
| Student obligations | Two seminars |
| Exam | Presentation of the seminars and an oral exam |
| Assessment | Seminar: 50%, oral exam: 50% |
| Literature | Essential: Zelenika, R.: Metodologija i tehnologija izrade znanstvenog i stručnog djela,4. izd., Ekonomski fakultet u Rijeci, Rijeka, 2000. Ivanović, Z.: Metodologija izrade znanstvenog i stručnog djela, Hotelijerski fakultet Opatija, Opatija, 1996. Recommended: Baban, Lj.<et al.>: Primjena metodologije znanstvenog istraživanja, Ekonomski fakultet Sveučilišta "Josipa Jurja Strossmayera" u Osijeku, Osijek, 1993. Pavić, H.: Znanstvene informacije, Školska knjiga, Zagreb, 1980. |

| Course: Applied higher mathematics | | Status: compulsory | Code: M-671 |
|---|---|---|---|

**Lecturer:** Boris Podobnik, Svjetlan Feretić

| Course delivery | lectures | | seminars | | | |
|---|---|---|---|---|---|---|
| Number of hours | 30 | | | | | |
| ECTS distribution | 1 | | 5 | | | |

**ECTS total: 6**

| Course objectives | To acquire the necessary skills in probability, statistics and functional analysis. |
|---|---|

**Topics**

The mean, median and other measures of central tendency.
The standard deviation and other measures of dispersion.
Moments, skewness and kurtosis.
Elementary probablity theory, the binomial, poisson, and GEV distributions.
Elementary sampling theory.
Statistical estimation theory, Estimation of Parameters, Point
estimates and interval estimates. Confidence-Interval Estimates.
Statistical Decision theory-Tests of hypothesis and significance.
Sampling theory, student's distribution, the chi-square test,
and F distribution.
The method of least squares, multiple regression.
Correlation theory. Correlation of Time Series.
Analysis of variance.
Nonparametric tests.
Analysis of time series, a Monte Carlo study.
Estimating dynamic  models.
Handling non-stationary time  series. Testing for nonstationarity.
Methods of functional analysis in elasticity.
Linear and nonlinear elastostatics.
Existence and uniqueness  theorem.
Bifurcation theory.
Applications to Elastodynamics.
Semigroup theory.

| Student obligations | Seminar. |
|---|---|
| Exam | Presentation of seminar, written and oral exam |
| Assessment | Based on the marks obtained for the seminar work, its presentation, written and oral exam. |
| Literature | Essential:<br>Murray Spiegel and Larry Stephens, Schaum's Outline of Statistics McGraw-Hill, New York, 1998.<br>J.E. Marsden, T.J.R. Hughes, Mathematical Foundations of Elasticity, Dover, New York, 1994.<br>Recommended:<br>S. Bernstein, R. Bernstein, Elements of Statistics II:  Inferential Statistics, Schaum's Series, McGraw-Hill, New York, 1999. |

| **Course: Numerical methods in engineering** | **Status:** compulsory | **Code: MK-621** |
|---|---|---|

**Lecturer:** Ivica Kožar

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| **Number of hours** | 45 | | | | | | |
| **ECTS distribution** | 1.5 | | 7.5 | | | | |

**ECTS total: 9**

| | |
|---|---|
| **Course objectives** | Enabling student to understand and apply numerical methods in engineering analysis. |
| **Topics** | Mathematical modelling, aproximation errors.<br>Linear equations (implicit and explicit methods).<br>Nonlinear equations (secant method, Newton method), solutions of systems of nonlinear equations.<br>Interpolations and interpolation polynomials (Lagrange, Hermite, Bezier).<br>Numerical derivations and integration (trapezoidal rule, Simpson equation, Gauss procedure).<br>Differential equations (eliptic, parabolic, hyperbolic), analogy of variational and differential methods, Dirichlet and Neumann boundary conditions.<br>Numerical solutions of differential equations using finite difference, finite volumes and finite element methods (examples of Poisson equation using finite differences, uncompressible fluid using finite differences, finite volumes and finite elements).<br>Partial differential equation (implicit and explicit methods, example of transient heat conduction). |
| **Student obligations** | Two assignments to be done with software by prof. I.Kožar and programs MathCAD and MatLab. |
| **Exam** | Two assignments and oral examination. |
| **Assessment** | Two assignments represent 80% and oral examination 20% of points. Minimum required points is 70% (70% - 79% = good, 81% - 90% = very good, > 91% = excellent). |
| **Literature** | **Essential:**<br>- Chapra S.C., Canale R.P. „Numerical methods for engineers", McGraw-Hill 1990<br>- Johnson, C. "NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS BY THE FINITE ELEMENT METHOD", Cambridge Univesity Press, 1994.<br>- Aganović, I., Veselić, K. "JEDNADZBE MATEMATICKE FIZIKE", Školska knjiga - Zagreb, 1985.<br>**Recommended:**<br>- Sorić J. „Metoda konačnih elemenata", Golden marketing – Tehnička knjiga 2004.<br>- MATLAB Partial Diferential Equations Toolbox.<br>- Kožar, Ivica; Lozzi-Kožar, Danila, 'Neki numerički postupci rješavanja istjecanja iz akumulacije' , *GRAĐEVINAR*. **58** (2006) , 5; 379-384. |

| Course: ANALYSIS AND MODELLING OF HYDROLOGICAL PROCESSES | | Status: compulsory | Code: H-611 |
|---|---|---|---|

**Lecturer:** Nevenka Ožanić

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 60 | 15 | | | | | |
| ECTS distribution | 2 | 2 | 8 | | | | |

**ECTS total: 12**

| | |
|---|---|
| **Course objectives** | - Introduction of students to the complex mechanisms of exchange of precipitation into the runoff and with interactions with soil as well as with hydrological regularities of flowing through and on different media, enabling them for their modeling<br>- Ensure the adoption of methodological procedures for independent processing of more complex problems of hydrological analyzes of time series<br>- Ensure the adoption of methodological procedures for independent processing and hydrological modeling of functions of natural water systems as well as analyzes of the functions and influences of structural objects and systems. |
| **Topics** | - Conceptual hydrological models, algorithms of the calibration of model's parameters, sensitivity and errors of model's parameters<br>- Genetic theory and modeling of runoffs, analysis of interactions: - meteorological parameters – infiltration – soil – surface, subsurface and underground runoff<br>- Stochastic analyzes and functions of distribution of non-representative hydrological time series and their modeling<br>- Analyzes of transient components in hydrological series<br>- Analyzes of intermittent hydrological processes<br>- Multivariate analysis of time series: stationary and seasonal models; analysis of the frequency of hydrological processes, analysis of the spectral density<br>- Random functions: generating and analysis of synthetic time series<br>- Analysis of dynamic hydrological series, Kalman's filters, non-linear models, linearization of non-linear systems, decomposition of seasonal components |
| **Student obligations** | Attendance to lectures and preparation of seminar work |
| **Exam** | The exam consists of preparation and verification of seminar work and written and oral examination |
| **Assessment** | Total grade is composed of seminar work grade (1/3), written exam grade consisting of the concept of answer (1/3) and oral exam with detailed explanation of the concept together with free discussion of selected questions with the examiner (1/3) |
| **Literature** | **Essential:**<br>Sing, V.P. (ed.) (1995): Computer Models of Watershed Hydrology, Water Resources Publications, Colorado.<br>Salas, J.D.; Delleur, J.W.; Yevjevich, V.; Lane, W.L.(1980): Applied Modeling of Hydrologic Time Series, Water Resources Publications, Littleton, Colorado.<br>Bras,R.L.; Rodrigez-Iturbe, I. (1993): Random Functions and Hydrology, Dover Publications, Inc., New York.<br>**Recommended:**<br>Beven, J.K. (2003): Rainfall-Runoff Modelling – The Primer, John Wiley & Sons, Ltd., Chichester.<br>Limić, N. (2002): Monte Carlo simulacije slučajnih veličina, nizova i procesa. Element, Zagreb.<br>Ožanić, N. (2003): Hidrogrami velikih voda. U: Priručnik za hidrotehničke melioracije – III kolo/knjiga 1 (ur. Ožanić, N.). Građevinski fakultet Sveučilišta u Rijeci, Rijeka, 197-237.<br>Ožanić, N. (2005): Statističke obrade velikih voda hidromelioracijskih sustava. U: Priručnik za |

|  | hidrotehničke melioracije – III kolo/knjiga 2 (ur. Ožanić, N.). Građevinski fakultet Sveučilišta u Rijeci, Rijeka, 33-75.<br>Marić, N. (1991): Modeliranje vremenskih serija, Savezni zavod za statistiku, Beograd.<br>Jevđević, V. (1974): Stohastički procesi u hidrologiji, Zavod za hidrotehniku Građevinskog fakulteta, Sarajevo. |
| --- | --- |

| Course: **MODELLING OF HYDRODYNAMIC AND TRANSPORT PROCESSES IN MARINE ENVIRONMENT** | **Status:** optional | **Code: H-612** |
|---|---|---|

**Lecturer:** Nenad Ravlić

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| **Number of hours** | 15 | | | 10 | | | |
| **ECTS distribution** | 0,5 | | | 1,5 | 4,0 | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | Develop understanding of hydrodynamics in coastal aquatic environments. Develop understanding of mathematical formulations and numerical modelling of flow and transport processes in homogeneous and stratified natural aquatic bodies. |
| **Topics** | Basics of physical oceanography. Geostrophic flows and wind-driven flows. Mathematical formulation of incompressible viscous free surface flow. Numerical modelling of incompressible viscous free surface flow (3-D,2-D hydrostatic models). Turbulent flows, turbulent transport equations. Impact of stratification on turbulent quantities. Numerical modelling of turbulent stratified flows. Application in coastal hydrodynamics applications. Mathematical and numerical models of advection, diffusion and dispersion (2D and 3D). Transport and mixing processes in shallow and semi-deep coastal basins in the presence of baroclinic effects. Bathymetry and boundary impacts on mixing and homogenization of stratified water column |
| **Student obligations** | Lectures and consultations with the lecturer, solving of one concrete assignment by using existing 2-D and 3-D free surface flow and advection/dispersion models. |
| **Exam** | Oral exam after successful completion of the assignment. |
| **Assessment** | Lectures 40%, assignment 40 %, exam 20 % |
| **Literature** | **Essential:** Bowden, K.F., Physical Oceanography of Coastal Waters, John Wiley, 1983. Fischer, H.B et al., Mixing in Inland and Coastal Waters, Academic Press, 1979. Casulli, V., Numerical Methods for Free Surface Hydrodynamics, Stanford University Lecture Notes, 1993. Rasmussen, E.B., Vested, H.J., Justesen, P, Ekebjaerg, L.C, System 3 – A Three-Dimensional Hydrodynamic Model, DHI, 1990.<br><br>**Recommended:** Pedersen, F.B., Lecture Notes on Coastal and Estuarine Studies, Environmental Hydraulics: Stratified Flows, Springer-Verlag, 1986. Okubo, A., Diffusion and Ecological Problems: Mathematical Models, Springer-Verlag, 1980. Tennekes, H., Lumley, J.L, First Course in Turbulence, MIT Press, 1972. |

| Course: COASTAL PROCESSES AND ENGINEERING | Status: optional | Code: H-613 |
|---|---|---|

**Lecturer:** Suzana Ilić

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | - To get basic understanding about waves, currents, sediment transport, their interaction and role in shaping the coastal environment<br>- To get familiar with existing field and laboratory data collection techniques and analysis<br>- To get familiar with up to date numerical models used for simulation of coastal processes<br>- To get apprehension for environmental impact of coastal structures<br>- Effectively use practical skills and quantitavie tools for solution of coastal engineering problems and design of coastal defences |
| **Topics** | - Tides, Surges and Sea Level Rise – theory, measurements, prediction<br>- Water Waves and Waves Induced Currents – theory, measurements, prediction – wave generation, wave propagation, wave transformation in shallow waters, breaking waves, wave induced currents in shallow water<br>- Coastal Geomorpholoy and Sediment Processes – sediment transport, small and large scale beach forms, beach profile changes, shoreline changes and coastal cells<br>- Coastal Defences – seawalls, groynes, breakwaters, beach nourishment, artificial beaches<br>- Monitoring and Numerical Modelling of Coastal Processes<br>- Coastal Management – Shoreline Management Plans, Coastal Habitat Management Plans, Coastal Flooding |
| **Student obligations** | Lectures and coursework |
| **Exam** | Coursework – Individual project |
| **Assessment** | Practicals (20%) and Coursework (80%) |
| **Literature** | **Essential:**<br>Abbot, M.B., Price, W.A.:Coastal, Esturial and Harbor Engineers Reference Book, Spon, London, 1994.<br>Dean, R.G., Dalrymple, R.A.: Coastal Processes with Engineering Applications, Cambridge University Press, 2001.<br>Komar, P.D.: Beach Processes and Sedimentation, Oregon State University, 1998. (essential)<br>Reeve, D., Chadwick, A. J., Fleming, C.: Coastal Engineering: Processes, Theory and Design Practice E & FN Spon,  2004. (good start) |

|  | **Recommended:**<br>Carter, R.W.G.; Woodroofe, C.D.:Coastal Evolution, Cambridge University Press, Cambridge, 1997.<br>Dean, R.G: Beach Nourishment Theory and Practice, World Scientific, Singapore, 2003.<br>Dean, R.G., Dalrymple, R.A.: Water Wave Mechanics for Engineers adn Scientists, World Scientific, Singapore, 1997.<br>Dingemans, M.W.: Water Wave Propagation over Uneven Bottoms (In 2 Parts) , World Scientific, Singapore, 1997.<br>Fredsoe, J., Deigaard, R: Mechanics of Coastal Sediment Transport , World Scientific, Singapore, 1992.<br>Goda, Y.: Random Seas and Design of Maritime Structures (2nd Edition) , World Scientific, Singapore, 2000.<br>Kamphuis, J.W.:Introduction to Coastal Engineering & Management, World Scientific, Singapore, 2000.<br>Komar, P.D.: CRC Handbook of Coastal Processes and Erosion, CRC Press, Boca Raton, 1983.<br>Massel, S.R.: Ocean Surface Waves: Their Physics and Prediction, World Scientific, Singapore, 1996.<br>Mei, C.C.: The Applied Dynamics of Ocean Surface Waves, World Scientific, Singapore, 1989.<br>Nielsen, P.: Coastl Bottom Boundary Layers and Sediment Transport, World Scientific, Singapore, 1992.<br>Silvester, R., Hsu, J.R.C: Coastal Stabilization, World Scientific, Singapore, 1997.<br>U.S. Army Engineer Research and Development Centers Coastal & Hydraulics Laboratory (CHL): Coastal Engineering Manual,<br>(http://chl.erdc.usace.army.mil/CHL.aspx?p=s&a=ARTICLES;104) |
| --- | --- |

| Course: **PRINCIPLES AND APPLICATION OF REMOTE SENSING** | **Status:** optional | **Code: H-614** |
|---|---|---|

**Lecturer:** Nevenka Ožanić

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| **Number of hours** | 15 | | | 10 | | | |
| **ECTS distribution** | 0.5 | | 2.0 | 1.5 | 2.0 | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | - Introduction to remote sensing data acquisition types (aerial photography, satellite imagery).<br>- Conceptual understanding of remote sensing.<br>- Developing skills in image processing, classification and interpretation of remote sensing imagery for solving typical problems. |
| **Topics** | - Basic theory of remote sensing (electromagnetic radiation, electromagnetic spectrum, interaction with the atmosphere).<br>- Types of imagery (aerial and satellite). Sensors and platforms.<br>- Geometric aspects of remotely sensed data.<br>- Aerial photography.<br>- Satellite imagery: image processing, classification and interpretation.<br>- Microwave remote sensing (radar).<br>- Quality assessment of spatial data.<br>- Digital model of relief and outflow of surface water drafting.<br>- Application of GIS in mapping and monitoring of watervresources<br>- Visualization and presentation of information. |
| **Student obligations** | - Attending the lectures and practicals according to the faculty norms.<br>- Completion and the delivery of all the assignments.<br>- Completion and the delivery of a seminar paper. |
| **Exam** | Consists of a written and an oral part. Positive grade in the writtten exam is a compulsory for the admition to the oral exam |
| **Assessment** | 20% practicals, 20% seminar, 60% exam |
| **Literature** | **Essential:**<br>Marinko Olujić (2001): Snimanje i istraživanje zemlje iz Svemira – sateliti, senzori, primjena. HAZU i Geosat. Zagreb<br>Hengl T., 2004. Geoinformacijski sustavi u inventarizaciji prirodnih resursa. Sveučilište u Osijeku, Osijek, 350 str.<br>Lillesand, T.M., Kiefer, R.W.: Remote Sensing and Image Interpretation, John Wiley & Sons Inc., USA, 1994.<br>Mather, P.M., Mather, P.: Computer Proccessing of Remotely Sensed Images: An Introduction, Wiley, John & Sons, Incorporated, USA, 2004.<br>Jensen, J.R.: Introduction to Digital Image Processing, Prentice Hall, New Jersey, USA, 2004.<br>Jensen, J.R.: Remote Sensing of the Environment: An Earth Resource Perspective, Prentice Hall, Upper Saddle River, New Jersey, 2000.<br>**Recommended:**<br>Burrough, P.A. and McDonnell, R.A., 1998. Principles of geographical information systems. Oxford University Press, Oxford, 327 pp. (www.oup.co.uk/best.textbooks/geography/burrough/)<br>Lyon, J.G., 2003. GIS for Water Resources and Watershed Management. Taylor & Francis, London, 266 pp. (bookshop.blackwell.com) |

| Course: KARST HYDROLOGY | | Status: optional | Code: H-615 |

**Lecturer: Zorko Kos (collaborator Josip Rubinić)**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| Course objectives | - Introduction to specific regularities and methodological basis of researches of flow processes in karst areas<br>- Application of knowledge adopted during undergraduate study and during first semester of doctoral study on researches of hydrological processes in karst areas<br>- Adoption of methodological procedures for independent elaborations and hydrological modeling of water appearances and processes in karst |
| Topics | - Geological and hydro-geological characteristics and specificities of karst areas<br>- Parameters and models of water flowing in karst areas<br>- Conceptualization of water systems in karst areas, numeric and stochastic approaches to modeling<br>- Karst aquifers, dynamics of fluctuation of underground water and mutual connection with the regime of discharge from the aquifer, flowing processes in surface and underground water appearances<br>- Karst water springs, separation of discharge hydrograms, discharge modeling<br>- Mechanisms of salinization of karst water springs, modeling of interrelation between sea and fresh water in littoral karst aquifers<br>- Parameters and modeling of water quality in karst aquifers and water appearances<br>- Water quality protection in karst areas |
| Student obligations | Attendance to lectures and preparation of seminar work |
| Exam | The exam consists of preparation and verification of seminar work and written and oral examination |
| Assessment | Total grade is composed of seminar work grade (1/3), written exam grade consisting of the concept of answer (1/3) and oral exam with detailed explanation of the concept together with free discussion of selected questions with the examiner (1/3) |
| Literature | **Essential:**<br>- Bonacci, O.: Karst hydrology, Springer Verlag, 1987.<br>- Clarke, R.T.: Statistical modeling in Hydrology. John Wiley and Sons, 1994.<br>- Dreybrot, W. : Processes in karst system: physic, chemistry and geology. Springer, Berlin Heildelberg New York, 1998.<br>**Recommended:**<br>- Bonacci, O., Roje-Bonacci, T. (2004): Posebnosti krških vodonosnika. U: Građevinski godišnjak ' 03/' 04 (ur.Simović, V.), Hrvatski savez građevinskih inženjera, Zagreb, 89-187.<br>- Mayer, D. (1993): Kvaliteta i zaštita podzemnih voda. Hrvatsko društvo za zaštitu voda i mora, Zagreb.<br>- Rubinić, J. (2007): Problemi zaslanjenja, korištenja i precrpljivanja priobalnih krških izvora i vodonosnika – primjeri Sjevernojadranskog područja. U: Priručnik za hidrotehničke melioracije – III kolo/knjiga 3 (ur. Ožanić, N.). Građevinski fakultet Sveučilišta u Rijeci, Rijeka, 321-387.<br>- Ford, D., Williams, P. (2007). Karst hydrogeology and Geomorphology. Wiley. Chichester.<br>Bögli, A.: Karst Hydrology and Physical Speleology, Berlin heidelberg New York, 1980.<br>Dingman, L.S., : Physical Hydrology. Macmillan Publising Company, New York, 1994.<br>Stanford, J; Gilbert, J; Danielopol, D. (ed.) Groundwater Ecology, Academc Press, Inc. San Diego, 1994. |

| Course: **MANAGEMENT OF HYDRO-MELIORATION SYSTEMS** | **Status:** optional | **Code: H-616** |
|---|---|---|

**Lecturer: Zorko Kos**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| **Number of hours** | 15 | | | 10 | | | |
| **ECTS distribution** | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | - Introduction with problems of hydro-melioration systems planning and management and with interactions of these systems with the surroundings<br>- Adoption of knowledge of modeling of plant – water – soil processes in hydro-melioration systems<br>- Adoption of knowledge for independent tasks solving in the domain of hydro-melioration systems planning and management with special emphasize on such systems in karst areas |
| **Topics** | - Processes plant – water – soil (water in nature, hydro-pedology, soil humidity, porosity, infiltration, permeability and capillary characteristics of the soil)<br>- Water balance in soil, deficits and water demands<br>- Dynamics of water movements in saturated and unsaturated conditions, modeling of water movements in soil<br>- Planning of the systems for drainage and irrigation (concepts, hydraulics, economics, ecology)<br>- Water springs, water reservoirs and acceptors<br>- Mathematical modeling of spatial components and transport systems of hydro-melioration systems<br>- Mathematical modeling of the investment policy<br>- Development of hydro-melioration systems and systems for irrigation in karst areas (problems, principles and possibilities) |
| **Student obligations** | Attendance to lectures and preparation of seminar work |
| **Exam** | The exam consists of preparation and verification of seminar work and written and oral examination |
| **Assessment** | Total grade is composed of seminar work grade (1/3), written exam grade consisting of the concept of answer (1/3) and oral exam with detailed explanation of the concept together with free discussion of selected questions with the examiner (1/3) |
| **Literature** | **Essential:**<br>Jensen , M. E.: Design and Operation of Farm Irrigation Systems; ASAE, 1981.<br>Đorđević, B.: Vodoprivredni sistemi. Naučna knjiga - GF Beograd, 1990.<br>**Kos, Z.: Hidrotehničke melioracije tla. Navodnjavanje. Zagreb. Školska knjiga, 1987.**<br>Kos, Z.: Hidrotehničke melioracije tla. Odvodnjavanje. Zagreb. Školska knjiga, 1989.<br>Kos, Z.: Hidrotehničke melioracije tla. Kvaliteta vode za navodnjavanje. Zagreb. Školska knjiga, 1991.<br>**Recommended:**<br>Priručnici za hidrotehničke melioracije I, II i III kolo; Društvo za odvodnjavanje i navodnjavanje Hrvatske, GF Rijeka; 1983.-2005. |

| Course:   Modelling of Aquatic Ecosystems | | Status: optional | Code: H-617 |
|---|---|---|---|

**Lecturer:   Boris KOMPARE**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| Course objectives | To understand and to use basic mathematical models for description of observed ecosystems |
| Topics | Types of mathematical models (statistical, conceptual, hybrid); static vs. dynamic models<br>Basic tools for model construction (statistics, partial diff. eq., machine learning)<br>State-of-the-Art tools for model construction (Stella, Matlab, Aquasim, Lagramge 2.0)<br>Basic bio-geo-chemical processes in the environment<br>Microorganisms' growth and population dynamics of higher organisms<br>Chemical reactions and reactors; biochemical reactions and reactors<br>Water quality models of stagnant waters: 0D, 1D, 2D and 3D<br>Water quality models of flowing waters: 1D, 2D and 3D<br>Models of drinking- and waste-water treatment plants<br>Transport and fate models of nutrients and/or phytopharmaceutical products |
| Student obligations | Active participation in lectures, study by course materials and individual research work, using modern equipment; individual elaboration of seminary work |
| Exam | presentation/defence of the seminary work |
| Assessment | on the basis of the seminary work quality and its presentation/defence |
| Literature | **Essential:**<br>• Jørgensen SE & Bendoricchio G.: Fundamentals of Ecological Modelling, 3rd Ed., Elsevier, 2001.<br>• Chapra SC.: Surface Water-Quality Modleing, The McGraw-Hill Companies, Inc., 1997.<br>• DeAngelis DL.: Dynamics of Nutrient Cycling and Food Webs, Chapman & Hall, 1992.<br><br>**Recommended:**<br>• ILEC: Guidelines of Lake management (http://www.ilec.or.jp/free_download/jpn/index.html )<br>• USEPA: Qual<br>• USEPA: BASINS<br>• USEPA: PRZM<br>• ASM1, ASM2<br>• ATV A-131<br>• Henze, Harremoes, La Cour Jansen & Arvin: Wastewater Treatment, 2nd Ed., Springer, 1997<br>• Schnoor JL: Environmental Modeling; Fate and Transport of Pollutants in Water, Air, and Soil, John Wiley & Sons, 1996.<br>• Orlob GT (Ed.): Mathematical Modeling of Water Quality: Streams, Lakes, and Reservoirs, John Wiley & Sons, 1982<br>• Ford A.: Modeling the Environment; An Introduction to System Dynamics Modeling of Environmental Systems, Island Press, 1999.<br>• Jørgensen SE.: Integration of Ecosystem Theories: A Pattern, 3rd Ed., Kluwer Academic Publishers, 2002.<br>• Patten BC & Jørgensen SE.: Complex Ecology: The Part-Whole Relation in Ecosystems, Prentice Hall Ptr., 1995.<br>• Hannon B. & Ruth M.: Dynamic Modeling, 2nd Ed., Springer, 2001<br>• Reynolds C.S.: The Ecology of Freshwater Phytoplankton, Cambridge Univ. Press, 1993.<br>• Keen R.E. & Spain J.D.: Computer Simulation in Biology, John Wiley & Sons, 1992. |

|  | • Levenspiel O.: Chemical Reaction Engineering, 3rd Ed., John Wiley & Sons, 1999.<br>• Barnes R.S.K. & Mann K.H.: Fundamentals of Aquatic Ecology, Blackwell Science, 1991.<br>• Bossel H.: Modeling and Simulation, A.K. Peters & Vieweg, 1994. |
|---|---|

| Course: **CONTEMPORARY APPROACHES TO WATER RESOURCES MANAGEMENT** | **Status:** optional | **Code: H-618** |
|---|---|---|

**Lecturer: Barbara Karleuša**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| **Number of hours** | 15 | | | 10 | | | |
| **ECTS distribution** | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | During the course students will be qualified in solving complex water resources management problems implementing modern methods ad approaches (system analysis, multicriteria optimisation, expert systems and neural networks). |
| **Topics** | − Water resources management and water management systems<br>− Integral water resources management and sustainable development<br>− Planning, designing, construction, management and control of water management systems<br>− Models in water resources management<br>− System analysis in solving water management problems<br>− Multicriteria optimisation methods in water management (technical, economic, social, environmental and other criteria/aspects)<br>− Artificial intelligence in water management (expert systems and neural networks)<br>− Possibilities for water management improvement |
| **Student obligations** | Attendance to lectures, preparation and presentation of seminar work |
| **Exam** | The exam consists of preparation, presentation and verification of seminar work and written and oral examination |
| **Assessment** | Total grade is composed of seminar work grade (40%), written exam grade consisting of the concept of answer (30%) and oral exam with detailed explanation of the concept together with free discussion of selected questions with the examiner (30%) |
| **Literature** | **Essential:**<br>- Karleuša, B.: Primjena postupaka višekriterijske optimalizacije u gospodarenju vodama, MSc Thesis, Građevinski fakultet u Zagrebu, 2002.<br>- Karleuša, B.: Unapređenje gospodarenje vodama korištenjem ekspertnog sustava, PhD Thesis, Građevinski fakultet u Zagrebu, 2005.<br>- Grigg, N.S.: Water resorces management, McGraw-Hill, New York, 1996.<br>- Đorđević, B.: Cybernetics in Water Resorces Management, Water Resources Publications, 1994.<br>**Recommended:**<br>- Margeta, J.: Osnove gospodarenja vodama, Građevinski fakultet u Splitu, 1992.<br>- Margeta, J.: Smjernice za integralni pristup razvoju, gospodarenju i korištenju vodnih resursa, Split 1999.<br>- Nikolić, I., Borović, S.: Višekriterijumska optimizacija, Beograd, 1996.<br>- Kompare, B.: The use of artificial intelligence in ecological modelling, PhD Thesis, University of Ljubljana and Royal Danish School of Pharmacy, 1995. |

| Course: ECO-HYDROLOGY | | Status: optional | Code: H-619 |
|---|---|---|---|

**Lecturer: Ognjen Bonacci**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | Introduction to the principles of sustenance of ecological systems connected with water resources<br>Enabling students for planning of ecologically accepted activities on open water streams and for the projects of water stream reconstructio<br>Enabling students for inter-disciplinary approach to solving the problems of environment protection and management of water resources |
| **Topics** | - Concept of sustainable development, definition of eco-hydrology<br>- Habitats, open water streams as habitats<br>- Hydrological cycle as support to biological diversity<br>- Eco-hydrology of the karst<br>- Hyporrhoeic zone<br>- Alluvium in open water streams as food and habitat<br>- Eco-remediation, open streams reconstruction<br>- Principles and methods of determination of ecologically accepted runoffs |
| **Student obligations** | Attendance to lectures according to faculty's regulations<br>Preparation and delivering of seminar work |
| **Exam** | The exam consists of preparation and verification of seminar work and oral examination |
| **Assessment** | 60% seminar, 40% exam |
| **Literature** | **Essential:**<br>- Bonacci O (2003): Ekohidrologija vodnih resursa i otvorenih vodotoka. Građevinsko-arhitektonski fakultet Split.<br>- Gordon ND, McMahon TA, Finlayson BL (2004): Stream hydrology – an introduction for ecologists. CRC Press, Boca Raton.<br>**Recommended:**<br>- Allan JD (1996): Stream ecology – structure and function of running waters. Chapman & Hall, London.<br>- Eagleson PS (2002): Ecohydrology – Darwinian expression of vegetation form and function. Cambridge University Press, Cambridge.<br>- Ford, D., Williams, P. (2007). Karst hydrogeology and Geomorphology. Wiley. Chichester. |

| Course: ADVANCED THEORETICAL SOIL MECHANICS | Status: compulsory | Code: G-601 |
|---|---|---|

**Lecturer: Željko Arbanas**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 60 | | | 15 | | | |
| ECTS distribution | 2.0 | | 6 | 4.0 | | | |

**ECTS total: 12**

| | |
|---|---|
| **Course objectives** | Prepare the candidate to understand the applications of nonlinear mechanics of continua and constitutive laws in describing the behaviour of real soils. Describe the critical state theory of the real soil behaviour. Explain the theoretical behaviour for different models of soils. Introduce the candidate to using the theoretical models of soil behavior in engineering applications. |
| **Topics** | Critical state theory and mechanical behaviour of real soils. Nonlinear mechanics of continua and constitutive laws. Elasticity and elasto-plasticity. Volumetric strains and plastic hardening. Particular nonlinear soil models and their restrictions: Duncan and Chang, Cam-Clay and modifications, models with kinematical hardening, and other. Ideal plasticity and limit analysis. Viscoplasticity. Model applications in different geotechnical problems. |
| **Student obligations** | Attendance to lectures. Preparing and delivering a seminar work. |
| **Exam** | After preparing and delivery of seminar work, the candidate in the oral part of the exam explain the results of investigations of the seminar work (oral exam). |
| **Assessment** | Preparing of course work 60%, delivery of the seminar work 20%, oral exam 20%. |
| **Literature** | **Essential:** ISSMFE: Constitutive Laws of Soils, Report of ISSMFE Subcommittee on Constitutive Laws of Soils and Proceedings of Discussion Session 1A, ed.: S. Murayama, XI International Conference on Soil Mechanics and Fundation Engineering, San Francisco, Japanese Society od Soil Mechanics and Fundation Engineering, Tokyo, 1985, p. 175. Schofield, A.N., Worth, C.P.: Critical State Soil Mechanics, McGraw-Hill Book Company, London, 1968, p. 310. Wood, D.M.: Soil Behaviour and Critical State Soil Mechanics, Cambridge University Press, Cambridge, 1990, p. 462. **Recommended:** Desai, C. S., Siriwardane, H.J.,: Constitutive Laws for Engineering Materials with Emphasis on Geologic Materials, Prentice-Hall, In., Englewood Cliffs, New Jersey, 1984, p. 468. Atkinson, J.H., Bransby, P.L.: The Mechanics of Soil - An Introduction to Critical State Soil Mechanics, McGraw-Hill Book Company (UK) Limited, London, 1978, p. 376. |

| Course: GEOTECHNICAL MODELLING | Status: optional | Code: G-602 |
|---|---|---|

**Lecturer: Leo Matešić**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| Course objectives | Application of nonlinear mechanics of continua and the constitutive models for the evaluation of soil behaviour in practical problems. Overview of the related software. |
| Topics | Static and dynamic loading of a saturated soil.<br>Stress-strain analysis for various geotechnical problems.<br>Analysis of coupled processes of fluid flow and deformation in soil.<br>Analysis of dynamic problems.<br>Backward analysis of geotechnical structures (case histories).<br>Overview of software for geotechnical problems (FLAC, Plaxis, GEO-Slope) |
| Student obligations | Attendance to lectures. Preparing and delivering a seminar work. |
| Exam | After preparing and delivery of the seminar work, the candidate in the oral part of the exam explains the results of investigations within the seminar work (oral exam). |
| Assessment | Preparing the course work 80%, delivering the seminar work 10%, oral exam 10%. |
| Literature | **Essential:**<br>Desai, C. S., Siriwardane, H.J.,: Constitutive Laws for Engineering Materials with Emphasis on Geologic Materials, Prentice-Hall, In., Englewood Cliffs, New Jersey, 1984, p. 468.<br>GEO-Slope Int. Ltd.: User's Guide Sigma/W for Finite Element / Deformation Analysis, Version 4, Calgary, 1998.<br>Itasca Consulting Group: FLAC, Fast Lagrangian Analysis of Continua, Manual, Minneapolis: Itasca Consulting Group Inc., 1993, 1995, 2000.<br>Plaxis: Plaxis, Finite Element Code fo Soil and Rock Analyses, R.B.J. Brinkgreve and P.A. Vermeer Eds., Rotterdam,/Brookfield: A.A. Balkema, 1998.<br>Wood, D.M.: Geotechnical Modelling, Spoon Press, Taylor & Francis Group, London, 2004, p. 488.<br><br>**Recommended:**<br>Naylor, D.J., Pande, G.N., Sompson, B., Tabb, R.: Finite Elements in Geotechnical Engineering, Pineridge Press Ltd., Swansa (UK), 1981, p. 245.<br>Bathe, K.J.: Finite Element Procedures in Engineering Analysis, Prentice-Hall, Englewood Cliffs, New Jersey, 1984.<br>Desai, C.S., Abel, J.F.: Introduction to The Finite Element Method, A Numerical Method for Engineering Anaylisis, Van Nostrand Reinchold Company, New York, 1972, p.477. |

| Course: SOIL CONSOLIDATION AND CREEP | | Status: optional | Code: G-603 |
|---|---|---|---|

**Lecturer: Janko Logar**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | Prepare the candidate to understand the coupled process of flow and consolidation in saturated soils in detail using nonlinear mechanics of continua and constitutive equations to describe processes of consolidation and creep in real soils. Explain the different numerical models for modeling consolidation process. Introduce candidate to use the software package to describe consolidation problems in engineering applications. |
| **Topics** | Basic principle of flows through the anisotropic porous media of a saturated soil.<br>Coupled process of flow and consolidation.<br>Pore pressure.<br>Constitutive models.<br>Numerical modeling of flow and consolidation.<br>Properties of soil and measurement in situ.<br>Applications and examples. |
| **Student obligations** | Attendance to lectures. Preparing and delivering a seminar work. |
| **Exam** | After preparing and delivery of seminar work, the candidate in the oral part of the exam explain the results of investigations of the seminar work (oral exam). |
| **Assessment** | Preparing of course work 80%, delivering of seminar work 10%, oral exam 10%. |
| **Literature** | **Essential:**<br>Šuklje, L.: Rheological Aspects of Soil Mechanics, Wiley–Interscience, London, 571 p., 1979.<br>Bathe, K.J.: Finite Element Procedures in Engineering Analysis, Prentice-Hall, Englewood Cliffs, New Jersey, 1984.<br>GEO-Slope Int. Ltd.: User's Guide Sigma/W for Finite Element/Deformation Analysis, Version 4, Calgary, 1998.<br><br>**Recommended:**<br>Nonveiller, E.: Mehanika tla i temeljenje građevina, Školska knjiga, Zagreb, p.780, 1979.<br>Desai, C. S., Siriwardane, H.J.,: Constitutive Laws for Engineering Materials with Emphasis on Geologic Materials, Prentice-Hall, In., Englewood Cliffs, New Jersey, 1984, p. 468.<br>Itasca Consulting Group: FLAC, Fast Lagrangian Analysis of Continua, Manual, Minneapolis: Itasca Consulting Group Inc., 1993, 1995, 2000.<br>Plaxis: Plaxis, Finite Element Code fo Soil and Rock Analyses, R.B.J. Brinkgreve and P.A. Vermeer Eds., Rotterdam,/Brookfield: A.A. Balkema, 1998. |

| Course: Advanced Rock Mechanics | | Status: optional | Code: G-604 |
|---|---|---|---|

| Lecturer: Ivan Vrkljan |
|---|

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0,5 | | 4,0 | 1,5 | | | |

| ECTS total: 6 |
|---|

| | |
|---|---|
| **Course objectives** | Introduction of students to the complex rock mechanics problems.<br>Ensure the adoption of methodological procedures for laboratory and in situ testing, determination of constitutive laws for rock and rock mass and modeling in geotechnical engineering. |
| **Topics** | Constitutive models for intact rock, rock joints and jointed rock masses.<br>In situ and induced stresses. In situ stress measurements.<br>Time dependent behaviour of rocks and rock masses.<br>Joint propagation in rock.<br>Engineering rock mechanics and rock engineering (slope stability, underground constructions).<br>Numerical modeling in rock mechanics. |
| **Student obligations** | Attendance to lectures. Preparation and delivering of seminar work. |
| **Exam** | After preparation of seminar work student must explain the seminar results if necessary. |
| **Assessment** | 80% preparation of seminar work, 10% explain of seminar results, 10% presentation of seminar work |
| **Literature** | **Essential:**<br>Hoek, E.: Rock Engineering, A Course Notes, http://www.rocscience.com<br>Hudson, J.A. and Harrison J.P., 2000., Engineering Rock Mechanics, An introduction to the principles, Pergamon, 444 p.<br>**Recommended:**<br>Harrison, J.P., Hudson, J.P., 2000., Engineering Rock Mechanics, Illustrative Worked Exsamples, Pergamon, 506 p.<br>Hudson, J.A., (editor-in-chief), 1993., Comprehensive Rock Engineering, Volume 1,2,3,4 and 5<br>Bell, F.G., 1995. Engineering Geology. Blackwell Science, Cambridge.<br>Hoek, E., Bray, J.W.: Rock Slope Engineering, 2nd. Edn., The Institute of Mining and Metallurgy, London, 527 p., 1977.<br>Desai, C. S., Siriwardane, H.J.,: Constitutive Laws for Engineering Materials with Emphasis on Geologic Materials, Prentice-Hall, In., Englewood Cliffs, New Jersey, 1984, p. 468.<br>GEO-Slope Int. Ltd.: User's Guide Sigma/W for Finite Element / Deformation Analysis, Version 4, Calgary, 1998.<br>Itasca Consulting Group: FLAC, Fast Lagrangian Analysis of Continua, Manual, Minneapolis: Itasca Consulting Group Inc., 1993, 1995, 2000.<br>Plaxis: Plaxis, Finite Element Code fo Soil and Rock Analyses, R.B.J. Brinkgreve and P.A. Vermeer Eds., Rotterdam,/Brookfield: A.A. Balkema, 1998. |

| Course: OBSERVATIONAL METHODS IN GEOTECHNICAL ENGINEERING | Status: optional | Code: G-605 |
|---|---|---|

**Lecturer: Željko Arbanas**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | Prepare the candidate to understand the behavior of soils and rock masses in practical geotechnical applications and numerical modeling in detail. Explain the active design approach in geotechnical engineering based on results of in situ measurements and monitoring. Introduce the candidate to use the software to describe different problems in engineering applications and in active geotechnical design. |
| **Topics** | Principle of of active design in geotechnical engineering.<br>Methods of numerical modeling in geotechnical engineering.<br>Methods of monitoring and in situ measurements.<br>Numerical modeling of reinforcement of soils and rock masses.<br>Backward analyses of soil and rock mass behavior.<br>Impacts on the constructions during execution.<br>Analyses of behaviour of executed geotechnical constructions (case histories). |
| **Student obligations** | Attendance to lectures. Preparing and delivering a seminar work. |
| **Exam** | After preparing and delivery of the seminar work, the candidate in the oral part of the exam explains the results of investigations within the seminar work (oral exam). |
| **Assessment** | Preparing of course work 80%, delivering of seminar work 10%, oral exam 10%. |
| **Literature** | **Essential:**<br>Nicholson, D.P., Tse, C.M., Penny, C.: The Observational Method in Ground Engineering: Principles and Applications, Report 185, CIRIA, London, 1999, p. 214.<br>Arbanas, Ž.: (2004) Prediction of Supported Rock Mass Behaviour by Analysing Results of Monitoring of Constructed Structures, Ph.D. Thesis, Faculty of Civil Engineering, University of Zagreb (in Croatian), 2004, p. 220.<br>Wood, D.M.: Geotechnical Modelling, Spoon Press, Taylor & Francis Group, London, 2004, p. 488.<br>Potts, D.M., Zdravković, L.: Finite Element Analysis in Geotechnical Engineering, Theory, Thomas Telford, London, 1999, p. 440.<br>Potts, D.M., Zdravković, L.: Finite Element Analysis in Geotechnical Engineering, Application, Thomas Telford, London, 2001, p. 427.<br>GEO-Slope Int. Ltd.: User's Guide Sigma/W for Finite Element / Deformation Analysis, Version 4, Calgary, 1998.<br>Itasca Consulting Group: FLAC, Fast Lagrangian Analysis of Continua, Manual, Minneapolis: Itasca Consulting Group Inc., 1993, 1995, 2000.<br>Plaxis: Plaxis, Finite Element Code fo Soil and Rock Analyses, R.B.J. Brinkgreve and P.A. Vermeer Eds., Rotterdam,/Brookfield: A.A. Balkema, 1998.<br><br>**Recommended:**<br>Desai, C. S., Siriwardane, H.J.,: Constitutive Laws for Engineering Materials with Emphasis on Geologic Materials, Prentice-Hall, In., Englewood Cliffs, New Jersey, 1984, p. 468.<br>Naylor, D.J., Pande, G.N., Sompson, B., Tabb, R.: Finite Elements in Geotechnical Engineering, Pineridge Press Ltd., Swansa (UK), 1981, p. 245. |

| Course: GEOTECHNICAL ASPECTS OF WASTE DISPOSAL | Status: optional | Code: G-606 |
|---|---|---|

| Lecturer: : Leo Matešić |
|---|

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

| ECTS total: 6 |
|---|

| Course objectives | The students are introduced to the Geoenvironmental Engineering field, especially in application of geotechnical principles for design and construction of waste disposal landfills. . |
|---|---|
| Topics | Environmental regulations<br>Geohazard of waste disposal.<br>Properties of waste material (solid waste, fluid waste, hazardous waste)<br>Design of waste disposal landfills<br>Hydrogeology of contaminated area.<br>Process of fluid flow and contamination of porous area.<br>Process of fluid flow in partial saturated material in waste disposal landfills.<br>Improvement and stabilization of waste material.<br>Geosynthetics and waste disposal landfills.<br>Fluid seepage control.<br>Close up of waste disposal landfills.<br>Waste management. |
| Student obligations | Attendance to lectures. Preparing and delivering a seminar work. |
| Exam | After preparing and delivery of seminar work, the candidate in the oral part of the exam explains the results of investigations of the seminar work (oral exam). |
| Assessment | Preparing of course work 80%, delivering of seminar work 10%, oral exam 10%. |
| Literature | **Essential:**<br>Qian, X., Koerner, R.M. and Gray, D.H.(2002), Geotechnical Aspects of Landfill Design and Construction, Prentice Hall<br>McBean, E.A., Rovers, F.A. and Farquhar, G.J. (1995), Solid Waste Landfill Engineering and Design, Prentice-Hall.<br>**Recommended:**<br>Babić, B et al., Geosintetici u graditeljstvu, Hrvatsko društvo građevinskih inženjera, 1995.<br>Bell, G.F.,Environmental geology, Principles and Practice. Blackwell Science, Cambridge, 1998.<br>C.W. Fetter, Contaminant Hydrogeology, 2. ed., Prentice Hall, 1998.<br>Proske, H., Vlcko, J., Rosenbaum, M.S., Dorn, M., Culshaw, M. and Marker, B., Special purpose mapping for waste disposal sites. Report of IAEG Commission 1: Engineering Geological Maps. Bulletin of Eng. Geol. Environ., 64 (1), 2005. |

| Course: GEOTECHNICAL ASPECTS OF EARTHQUAKE ENGINEERING | Status: optional | Code: G-607 |
|---|---|---|

**Lecturer: : Leo Matešić**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | Students are introduced to the Earthquake engineering field, especially in application of geotechnical principles for design of structures in seismic conditions. |
| **Topics** | Earthquake and vibration in soil.<br>Soil behaviour under accidentally vibration.<br>Dynamic properties of soil.<br>Earth pressure under dynamic condition.<br>Seismic slope stability.<br>Soil liquefaction<br>Interaction between soil and foundation under dynamic condition.<br>Deterministic and probalistic methods for hazard analysis. |
| **Student obligations** | Attendance to lectures. Preparing and delivering a seminar work. |
| **Exam** | After preparing and delivery of seminar work, the candidate in the oral part of the exam explain the results of investigations of seminar work (oral exam). |
| **Assessment** | Preparing of course work 80%, delivering of seminar work 10%, oral exam 10%. |
| **Literature** | **Essential:**<br>Das, B. M. (1992) Principles of Soil Dynamics. PWS-KENT<br>Ishihara, K., (1996): Soil Behaviour in Earthquake Geotechnics. Clarendon Press - Oxford University Press<br>Itasca Consulting Group: FLAC, Fast Lagrangian Analysis of Continua, Manual, Minneapolis: Itasca Consulting Group Inc., 1993, 1995, 2000.<br>Kramer, S. L. (1996) Geotechnical Earthquake Engineering, Prentice Hall<br><br>**Recommended:**<br>Plaxis: Plaxis, Finite Element Code fo Soil and Rock Analyses, R.B.J. Brinkgreve and P.A. Vermeer Eds., Rotterdam,/Brookfield: A.A. Balkema, 1998. |

| Course: HAZARDS IN GEOTECHNICAL ENGINEERING | Status: optional | Code: G-608 |
|---|---|---|

**Lecturer: Čedomir Benac**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | - | 0 | 10 | - | - | |
| ECTS distribution | 1.5 | - | 4 | 0.5 | - | - | |

**ECTS total:** 6

| | |
|---|---|
| **Course objectives** | Basic understanding of links between endodynamic and exodynamic processes and geohazard phenomena and the types of natural and antropogenic hazards. Students will learn about the influences of land-use planning and constructions works to the changes in hazard and risk level. The course also covers the role of geotechnical engineering in mitigation and avoidance of geological hazard. |
| **Topics** | Natural and artificial hazard and risk<br>Seismotectonic activity<br>River erosion and accumulation<br>Marine erosion and accumulation<br>Mass movements and slope stability<br>Geohazard assesment and zoning<br>Influence of construction on hazard and risk level<br>Role of geotechnical engineering in mitigation and avoidance of hazard and risk |
| **Student obligations** | Attendance to lectures. Preparation and delivery of seminar work (alternativa: paper). |
| **Exam** | After preparation and delivery of seminar work, the candidate in the oral part of the exam explain the results of investigations of seminar work (oral exam). |
| **Assessment** | Preparation of seminar work 80%, oral presentation 20%. |
| **Literature** | **Essential:**<br>Bell, G.F., Geological hazard. Their assesment, avoidance and mitigation. Spon Press, 2003.<br>Bell, G.F.,Environmental geology, Principles and Practice. Blackwell Science, 1998.<br>Turner, A.K., Schuster, R.L., Landslides, Investigation and Mitigation, Special report 247, Transportation Research Board, National Research Council, National Academy Press, 1996.<br>Smith, K., Environmental Hazards: Assessing Risk and Reducing Disaster 3. ed. Routledge, 2001.<br><br>**Recommended:**<br>Van Westen, C.J., Application of geographic information systems to landslide hazard zonation. Vol. 1: Theory.- ITC Publication No. 15, 1993.<br>Keller, A.E., Environmental Geology. 8. ed. Prentice Hall, 2000.<br>Allen, P. A., Earth Surface Processes. Blackwell, 1997.<br>Bobrowsky, P. T. (ed.), Geoenvironmental Mapping. Balkema, 2002.<br>Morris, P. & Therivel, R. (ed.): Methods of Environmental Impact Assessment. 2. ed. Spon Press, 2001. |

| Kolegij: **Transportni procesi u betonu** | | Status: izborni | Oznaka: **MK-622** |
|---|---|---|---|

**Nastavnik:** Gojko Balabanić

| Oblik provedbe kolegija | predavanja | konsultacije | seminari | programi | vježbe | kolokviji | - |
|---|---|---|---|---|---|---|---|
| **Broj predviđenih sati** | 15 | 10 | | | | | |
| **Raspodjela ECTS** | 0.5 | 1.5 | 4.0 | | | | |

**Ukupan broj ECTS bodova:   6**

| | |
|---|---|
| **Ciljevi kolegija** | Upoznati studente sa kompleksnom fizikalno–kemijskom analizom transportnih procesa u betona i njihovom primjenom u računarskoj procjeni uporabnih svojstava betona. |
| **Teme kolegija** | **Fizikalni i kemijski procesi u betonu.** Fizikalni mehanizmi transporta. Interakcija kemijskih spojeva sa čvrstim tijelom. **Transportne pojave u kemijski reaktivnim mješavinama.** Koncepti mehanike kontinuuma. Zakoni sačuvanja za jedan kontinuum. Konstitutivne jednadžbe za jedan kontinuum. Zakoni sačuvanja za linearnu kemijski reaktivnu mješavinu. Konstitutivne jednadžbe za linearnu mješavinu. **Modeli transporta topline, vlage i kemijskih spojeva u poroznom mediju.** Modeli transporta vode i vodene pare. Vezani transport topline i vlage. Transport kemijskih spojeva. Vezani transport topline, vlage i kemijskih spojeva. Higro – termo – mehanički modeli. |
| **Studentske obaveze** | Studenti su dužni izraditi i prezentirati programski zadatak koji se sastoji od rješavanja jednostavnijeg problema transportnih procesa pomoću numeričkih metoda |
| **Način polaganja ispita** | Završna prezentacija programskog zadatka. |
| **Ocjenjivanje studenata** | 100 % programski zadatak |
| **Literatura** | **Obavezna:**<br>1. Černy, R., Rovnanikova, P.: *Transport Processes in Concrete*, Spon Press, 2002.<br>2. Balabanić, G.: *Numeričko modeliranje procesa korozije čelika armiranobetonskih konstrukcija u moru,* Disertacija, Zagreb, 1993.<br>**Preporučljiva:**<br>1. Bear, J., Bachmat, Y.: *Introduction to Modeling of Transport Phenomena in Porous Media*, Dordrecht: Kluwer, 1990. |

| Course: MECHANICS OF QUASI-BRITTLE MATERIALS | Status: optional | Code: MK-623 |
| --- | --- | --- |

**Lecturer: Joško Ožbolt**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
| --- | --- |
| **Course objectives** | Understanding processes in quasi-brittle materials and aquring the knowledge for their modeling. |
| **Topics** | Concrete – quasi-brittle material. Overwiev of the behaviour of concrete under three-axial loading conditions. Determination of macroscopic patameters of concrete that are relevant for its fracture behaviour. Why we need to apply fracture machanics in analysis and design of concrete-like materials. Basics of linear and nonlinear fracture mechanics. Application of fracture mechanics in nonlinear analysis of concrete structures using finite element method. Size effect – influence of the structure size on the nominal strength and ductility of concrete structures. Basic concept for modelling of concrete: (i) theory of plasticity, (ii) damage mechanics, (ii) microplane theory and (iii) smeared crack models. Regularization: (i) local and non-local continuum and (ii) higher order continuum. |
| **Student obligations** | One assignment to be done. |
| **Exam** | An assignment and oral examination. |
| **Assessment** | Assignment represent 80% and oral examination 20% of points. |
| **Literature** | **Essential:**<br>- Karihaloo, B.L.: Fracture mechanics & structural concrete, Concrete Design & Construction Series, Sidney, 1995.<br>- Bažant, Z.P., Cedolin, L.: Stability of Structures: Elastic, Inelastic, Fracture and Damage Theories, Oxford University Press, NY, 1991.<br>- Belytschko, T., Kam, W. And Moran, B.: Nonlinear Finite Elements for Continua and Structures, Wiley, 2000.<br>**Recommended:**<br>- Ožbolt, J.: Masstabseffekt und Duktilität von Beton un Sthalbeton Konstruktionen, Habilitationsschrift, Universität Stuttgart, 1995.<br>- Jirasek, M. and Bažant, Z.P.: Inelastic Analysis of Structures, Wiley, 2002.<br>- Zienkiewicz, O.C. and Taylor, R.L.: The Finite Element Method, 5th edition,Butterworth-heinmann, Oxford, 2000. |

| Course: **FRACTURE MECHANICS** | **Status:** optional | **Code: MK-624** |
|---|---|---|

**Lecturer: Zoran Ren**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| **Number of hours** | 15 | | | 10 | | | |
| **ECTS distribution** | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | Enabling student to apply FM in structural analysis. |
| **Topics** | Introduction, Types of Fracture, Linear Elastic Fracture Mechanics, Elasto-Plastic Fracture Mechanics, Fatigue Crack Growth, Fracture Mechanics of Concrete, Finite Element Techniques in Fracture Mechanics |
| **Student obligations** | One assignment to be done. |
| **Exam** | An assignment and oral examination. |
| **Assessment** | Assignment represents 80% and oral examination 20% of points. |
| **Literature** | **Essential:**<br>• Linear elastic fracture mechanics for engineers : theory and applications / L. P. Pook. - Southampton ; Boston : WIT Press, cop. 2000.<br>• Elementary engineering fracture mechanics / by David Broek. – Dordrecht : M. Nijhoff, 1986.<br>• Fracture mechanics / H. L. Ewalds, R. J. H. Wanhill. - London : Arnold, 1989.<br>• Fracture mechanics : fundamentals and applications / T. L. Anderson. - 2nd ed. - Boca Raton : CRC Press, cop. 1995.<br>**Recommended:**<br>• The practical use of fracture mechanics / by David Broek. - Dordrecht ; Boston ; London : Kluwer, 1988.<br>• Engineering fracture mechanics / S. A. Meguid. - London ; New York :Elsevier Applied Science, 1989.<br>• Fracture Mechanics of Rock / ed. by Barry Kean Atkinson. - [Reprinted with corrections 1989]. - London [etc.] : Academic Press, 1989.<br>• Concrete design based on fracture mechanics / editors Walter Gerstle, Zdenek P. Bažant. - Detroit : American Concrete Institute, 1992.<br>• Mehanika loma : zbrano gradivo / Maks Oblak. - 1. izd. - Maribor : Fakulteta za strojništvo, 1995.<br>• Fracture mechanics of concrete : material characterization and testing / ed. by A. Carpinteri, A.R. Ingraffea. - The Hague : Martinus Nijhoff Publishers, 1984.<br>• Numerical fracture mechanics / by M. H. Aliabadi and D. P. Rooke. - Dordrecht : Kluwer Academic Publishers ; Southampton ; Boston : Computational Mechanics Publications, 1991.<br>• Computational methods in the mechanics of fracture / edited by Satya N. Atluri. – Amsterdam : North-Holland, 1986. |

| Course: MODELING OF BUILDINGS | | Status: optional | Code: MK-625 |
|---|---|---|---|

**Lecturer: Ivica Kožar**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | Application of computational modeling methods in analysis of structures under complicated conditions. |
| **Topics** | Modeling of multiphysics problems in structural analysis:<br>Influence of heat and humidity on structural durability.<br>Structure – soil interaction.<br>Structure – fluid (water) interaction.<br>Structure – loading interaction (vehicle speed influence).<br>Contact problems in some types of structures.<br>Multilevel structural modeling.<br>Examples of various isoparametric FE, problems with isoparametric elements, reduced integration, incompatible modes. Formulation of geometrically nonlinear problems.<br>Formulation of materially nonlinear problems. FE in dynamic analysis. |
| **Student obligations** | An assignment to be done with software by prof. I.Kožar and programs MathCAD and MatLab. |
| **Exam** | An assignment and oral examination. |
| **Assessment** | Assignment represent 80% and oral examination 20% of points. Minimum required points is 70% (70% - 79% = good, 81% - 90% = very good, > 91% = excellent). |
| **Literature** | **Essential:**<br>- Wilson E.L. „Three-Dimensional Static and Dynamic Analysis of Structures", CSI, Berkeley, California, 2003.<br>- Zienkiewitz, O.C., Taylor, R.L.: The Finite Element Method Vol. I i II, McGraw-Hill 1989. i 1991.<br>- Cook, R.D., Malkus, D.S., Plesha, M.E., Witt, R.J., Concepts and Applications of Finite Element Analysis, Wiley, 2002.<br>- Sorić J. „Metoda konačnih elemenata", Golden marketing – Tehnička knjiga 2004.<br>**Recommended:**<br>- Štimac I, Meštrović D, Kožar I 2004, 'Analiza mostovnih konstrukcija pobuđenih pokretnim opterećenjem', *GRAĐEVINAR* vol. 56, no. 6, p. 347-353<br>- Ožbolt J, Kožar I, Eligehausen R, Periškić G 2005, 'Three-dimensional FE analysis of headed stud anchors exposed to fire', *Computers and Concrete*, vol. 2, no. 4, p. 249-266.<br>- Lozzi-Kožar D, Kožar I, Holjević D 2005, 'Djelovanje topline na zid bujice', *GRAĐEVINAR*, vol. 57, no.11, p. 879 – 887.<br>- Ožbolt J, Meštrović D, Kožar I 2006, 'Tridimenzijski proračun prearmiranih betonskih greda, *GRAĐEVINAR*, vol. 58, no.2, p. 95 – 101. |

| Course: EARTHQUAKE ENGINEERING | Status: optional | Code: MK-626 |
|---|---|---|

**Lecturer: Mehmed Čaušević**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4 | 1.5 | | | |

**ECTS total:  6**

| | |
|---|---|
| **Course objectives** | The Eurocode 8 is based on science and its application is very complex. In Eurocode 8 method of structural analysis based on nonlinear inelastic behaviour of structures is given, together with the classical linear elastic modal analysis procedure. The designers in Croatia do not have necessary knowledge for using the method of inelastic nonlinear spectral analysis in the structural design.<br>Although the natural vibration modes of the elastic system are no longer uncoupled if the system responds in the inelastic range, modal coupling is week. This week coupling of modes permitted development of **the modal pushover analysis procedure** to include contributions of modes higher than the first mode in nonlinear static procedures for estimating seismic demands for inelastic systems. In such a way the seismic demand for inelastic system is possible to be established for the particular earthquake time history.<br>The structures should be resistant and stiff in case of moderate seismic event with short return periods, and have ductility and the ability for energy dissipation in case of stronger earthquakes with longer return periods. The energy dissipation is achieved through the non-linear behaviour of the structure. These inelastic deformations take place at those parts of the structure that were designed for this purpose. |
| **Topics** | - A nonlinear analysis methods for performance based seismic design (evaluation of modal pushover procedures using Strong - Motion records of buildings after Chopra & Goel; the N2 method: combination of nonlinear pushover analysis of MDOF model with the response spectrum analysis of an equivalent SDOF system   after Fajfar);<br>- Seismic analysis of bridges;<br>- Experimental and numeric analysis of models of steel frames with eccentric diagonals; |
| **Student obligations** | Obligatory attendance to the course |
| **Exam** | Written exam;  Independent work on the specific topic |
| **Assessment** | Results of the written exam and the quality of independent work |
| **Literature** | **Essential:**<br>1. Chopra, A. K., and Goel, R. K., 2002. A modal pushover analysis procedure for estimating seismic demands for buildings, *Earthquake Eng. Struct. Dyn.* **31** (3), 561-582<br>2. Goel, R. K., and Chopra, A. K., 2004. Evaluation of Modal and FEMA Pushover Analysis: SAC Buildings, *Earthquake Spectra,* **20**, (1), 225-254<br>3. Fajfar, P., 2000, A Nonlinear Method for Performance Based Seismic Design, *Earthquake Spectra,* **16**, (3), 573-592<br>4. Gupta, B., and Kunnath, S. K., 2000. Adaptive spectra – based pushover procedure for seismic evaluation of structures, *Earthquake Spectra* **16** (2), 367-392<br>5. Dusicka, P., Itani, A. M. and Buckle, I. G., Cyclic Behaviour of Shear Links and Tower Shaft Assembly of San Francisco-Oakland Bay Bridge Rower, *Report CCEER 02-06, Centre for Civil Engineering Earthquake Research*, University of Nevada, Reno, Nevada, 2002.<br>6. Čaušević, M., Zehentner, E., Nonlinear seismic analysis of structures according to EN 1998-1:2004, in Croatian, GRAĐEVINAR **59** (2007), 9.<br>7. Androić, B., Bulić, M., Čaušević, M., Reliability of seismic connection in steel frames with eccentric diagonals, in Croatian, GRAĐEVINAR **59** (2007), 8, 675-683. |

8. Čaušević, M., Fajfar, P., Fischinger, M., Isaković, T., Analysis of influence of seismic forces on viaducts according to Eurocode 8, GRAĐEVINAR **55** (2003) 3.

9. Mackie, K. and Stojadinovic, B., Seismic Demands for Performance-Based Design of Bridges, *PEER Report 2003/16,* Berkeley: Pacific Earthquake Engineering Centre, College of Engineering, University of California, Berkeley, 2003

10. Pinto, A. V., Pseudodynamic and Shaking Table Tests on R. C. Bridges, *Report No. 5,* ISPRA: The European Laboratory for Structural Assessment (ELSA), 1996.


**Recommended:**

1. Čaušević, M., 2005. *Dynamics of Structures*, in Croatian, Školska knjiga, Zagreb
2. Chopra, A. K., 2001. *Dynamics of Structures: Theory and Applications to Earthquake Engineering,* 2nd Edition, Prentice Hall, Englewood Cliffs, NJ

| Course: FUNDAMENTALS OF NON-LINEAR MECHANICS | Status: compulsory | Code: TM-641 |
|---|---|---|

**Lecturer: Gordan Jelenić**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 60 | | | 15 | | | |
| ECTS distribution | 2 | | | 2 | 8 | | |

**ECTS total: 12**

| | |
|---|---|
| **Course objectives** | - Learn about the rigorous approach to mechanics of deformable bodies and pinpoint the sources of the approximations in the second-order theory, linear mechanics and engineering theory of structures<br>- Learn about the coordinate-free tensorial description of the governing equations of mechanics of deformable bodies<br>- Acquire the additional knowledge needed for the numerical implementation<br>- Get introduced to the background and the methodology needed for the start of a more independent research in non-linear continuum mechanics |
| **Topics** | <u>Basic tensor theory.</u> Vector spaces. Change of co-ordinate basis. Cartesian tensors. Tensor product and contraction. Tensor algebra. Eigenanalysis of symmetric, skew-symmetric, and orthogonal second-order tensors. Contravariant and covariant components of vectors and tensors. Contravariant and covariant tensors. Tensor fields. Differential operators and their application to tensor fields.<br><u>Analysis of finite deformation.</u> Kinematic equations and descriptions. Physical quantities in different descriptions. Orientation of an observer. Change of physical quantities under a change of the observer. Deformation gradient. Left and right Cauchy-Green deformation tensors. Change of volume and area. Change of distance and angle. Polar decomposition of the deformation gradient. Different strain tensors.<br><u>Strong and weak form of equations of motion.</u> Kinetics of a deformable body. Conservation of mass. Equilibrium equations and Cauchy´s theorem. Cauchy´s equations of motion. Weak form of Cauchy´s equations of motion. Cauchy´s, Kirchhoff´s, first and second Piola—Kirchhoff´s stress tensors. Other stress tensors and conjugacy.<br><u>Constitutive equations of elasticity.</u> Noll´s axioms, simple materials, examples in fluids. Elastic materials, homogeneity and isotropy. Basic principles of Cauchy´s elasticity. Material symmetry, isotropy and anisotropy (eolotropy). Isotropic elastic deformable materials. Green´s elasticity (hyperelasticity). Saint Venant-Kirchhoff´s, Hencky´s, neo-Hookean, Mooney-Rivlin´s and Ogden´s material models.<br><u>Non-linear solution procedures.</u> Iterative Newton--Raphson method. Incremental/iterative solution procedure under load or displacement control. Arc-length method.<br><u>Examples of inelastic behaviour.</u> Fundamentals of the theory of plasticity. Yield limit and surface. |
| **Student obligations** | Six-part coursework (one part per each of the above headings) requiring about six-week full-time work. |
| **Exam** | Positively marked coursework and an oral exam including a discussion on the coursework. |
| **Assessment** | Based on the quality of the coursework and knowledge shown during the oral exam. |
| **Literature** | **Essential:**<br>R.W. Ogden, Non-linear Elastic Deformations, Dover, New York, 1997. ISBN 0-486-69648-0<br>T. Belytschko, W.K. Liu, B. Moran, Nonlinear Finite Elements for Continua and Structures, Wiley, Chichester, 2000, ISBN 0-471-98773-5, 0-471-98774-3<br>M.A. Crisfield, Non-linear Finite Element Analysis of Solids and Structures, Volumes 1 & 2, Wiley, Chichester, 1991, 1997, ISBN 0-471-97059-X, 0-471-95649-X<br>**Recommended:** |

| | J. Lubliner, Plasticity Theory, Macmillan, New York, 1990. ISBN 0-02-946307-6 |
| | J.C. Simo, T.J.R. Hughes, Computational inelasticity, Springer, New York, 1998. ISBN 0-387-97520-9 |
| | M. Saje, S. Srpčič, Osnove nelinearne mehanike trdnih teles, Univerza v Ljubljani, Fakulteta za gradbeništvo in geodezijo, Ljubljana, 1993. ISBN 86-80223-23-9 |
| | I. Alfirević, Uvod u tenzore i mehaniku kontinuuma, Golden marketing, Zagreb, 2003. |

| Course: Algorithmic preservation of mechanical properties | Status: optional | Code: TM-642 |
|---|---|---|

**Lecturer: Gordan Jelenić**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | Learn about basic problems in the selected topic in finite-element and time-stepping design in non-linear solid mechanics where the emphasis is put on the preservation of some of the fundamental mechanical properties. |
| **Topics** | 1. Shear locking in beam elements and how to reduce or avoid it through appropriate interpolation of displacements and rotations<br>2. Strain-invariance in finite elements with rotational degrees of freedom<br>3. Objectivity of the algorithmic solution based on the choice of reference surface, line or point in finite elements with rotational degrees of freedom<br>4. Importance of preservation of orbits of relative equilibria in stability of numerical solutions of equations of motion<br>5. Importance of exact solutions along the orbits of relative equilibria in the accuracy analysis of a numerical solution<br>6. Interaction between translational and rotational relative equilibria in 3D motion<br>7. Non-group numerical damping in mechanical systems with symmetries<br>8. Local and global accuracy of time-stepping schemes<br>9. Importance of numerical preservation of mechanical constants in time-stepping schemes<br>10. Time-stepping schemes for rigid-body dynamics |
| **Student obligations** | To prepare and present a seminar work. |
| **Exam** | By submission and presentation of the seminar. |
| **Assessment** | Based on the quality of the seminar, its presentation and discussion. |
| **Literature** | **Essential:**<br>1. Crisfield, M.A. and Jelenic, G., Objectivity of strain measures in geometrically exact 3D beam theory and its finite element implementation, Proc. R. Soc. Lond. A 455, 1125-1147 (1999)<br>2. Jelenić, G. and Crisfield, M.A., Problems associated with the use of Cayley transform and tangent scaling for conserving energy and momenta in the Reissner--Simo beam theory, Comm. Num. Meth. Eng. 18, 711-720 (2002)<br>3. Bottasso, C.L. and Borri, M., Integrating finite rotations, Comp. Meth. Appl. Mech. Eng. 164, 307-331 (1998)<br>8. Graham, E. and Jelenić, G., A general framework for conservative single-step time-integration schemes with higher-order accuracy for a central-force system, Comp. Meth. Appl. Mech. Eng. 192, 3585-3618 (2003)<br>**Recommended:**<br>1. Jelenic, G. and Crisfield, M.A., Interpolation of rotational variables in nonlinear dynamics of 3D beams, Int. J. Num. Meth. Eng. 43, 1193-1222 (1998)<br>2. Jeleni\c, G. and Crisfield, M.A., Geometrically exact 3D beam theory: Implementation of a strain-invariant finite element for statics and dynamics, Comp. Meth. Appl. Mech. Eng. 171, 141-171 (1999)<br>3. Graham, E., Jelenić, G. and Crisfield, M.A., A note on the equivalence of some recent time-integration schemes for N-body problems, Comm. Num. Meth. Eng. 18, 615-620 (2002)<br>4. Munoz, J.J., Jelenić, G. and Crisfield, M.A., Master--slave approach for the modelling of joints with dependent degrees of freedom in flexible mechanisms, Comm. Num. Meth. Eng. 19, 689-702 (2003) |

| Course:  MESHLESS NUMERICAL METHODS | **Status:** optional | **Code: TM-643** |
| --- | --- | --- |

**Lecturer:  VEDRANA KOZULIĆ**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Number of hours** | 15 | | - | 10 | | | |
| **ECTS distribution** | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
| --- | --- |
| **Course objectives** | Course objectives are introducing with numerical procedures for solving various phisical problems by meshless methods, and understanding the concept of adaptive technique in the numerical modeling. At the end of the course unit the student is expected to be able to use that knowledge in his own science-investigation work and to make parts of computational programs using an adaptive technique in the field of his special interest. |
| **Topics** | - Numerical solutions of desired accuracy<br>- The idea of R-functions<br>- Numerical modeling by the collocation method with smooth finite functions<br>- Adaptive technique for modeling of structures under the impulse loads (impact, explosion)<br>- Adaptive technique for modeling of wave processes<br>- Non-linear numerical structural analysis using an adaptive technique |
| **Student obligations** | Elaboration of seminar work of selected topic<br>Publication of obtained results in conferences and journals |
| **Exam** | Sitting for an examination is through the seminar work |
| **Assessment** | Assessment during the research work in the selected topic and through the presentation of obtained results |
| **Literature** | **Essential:**<br>1) Kozulić V., *Numerical modeling by the fragment method with  $R_{bf}$  functions*, Ph. D. Thesis, Faculty of civil engineering, University of Split, 1999.<br>2) Gotovac H., *Density driven flow and transport in aquifers*, Ms. Sc. Thesis, Faculty of civil engineering and architecture, University of Split, 2005.<br>**Recommended:**<br>1) Prenter P. M., *Splines and Variational Methods*, John Wiley & Sons, Inc., New York, 1989.<br>2) Rvachev V. L., *Theory of  R-functions and their application*, Naukova dumka, Kiev, 1982.<br>3) Čolak I., *Numerical modeling of bending thin plates of general shape*, Ph. D. Thesis, Faculty of civil engineering, University of Mostar, 2002. |

| Course: Plates and shells | | Status: optional | Code: TM-644 |
|---|---|---|---|

**Lecturer: Boštjan Brank**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | Present (a) theory of shell structures and (b) finite element procedures to solutions of structural shell problems |
| **Topics** | Theory:<br>　1.　Nonlinear shell theory<br>　2.　Dynamics of shells<br>Analytical solutions:<br>　3.　Analytical solutions to some linear plate and shell problems<br>Finite element formulations:<br>　4.　Finite element formulation of nonlinear shell theory<br>　5.　Finite element formulation for dynamic analysis of shells<br>Shell structures design:<br>　6.　Design of metal tanks according to Eurocode<br>　7.　Design of reinforced concrete shells<br>　8.　Finite element limit load analysis of reinforced concrete plates<br>Optimization:<br>　9.　Shape optimal design of shells<br>Finite element analysis codes:<br>　10.　Finite element analysis of shell problems with Feap<br>　11.　Finite element analysis of shell problems with Sap2000 Nonlinear<br>　12.　Finite element analysis of shell problems by using symbolic system AceGen |
| **Student obligations** | To do a seminar work |
| **Exam** | Presentation of the seminar work |
| **Assessment** | Based on the seminar work and the quality of its presentation and discussion. |
| **Literature** | **Essential:**<br>　1.　P.L. Gould, Analysis of shells and plates, Springer, 1988.<br>　2.　J.C. Simo, D.D. Fox, On a stress resultant geometrically exact shell model. Comp. Meth. Appl. Mech. Engng., 72, 267-304, 1989 &  73, 53-62, 1989 & 79, 21-70, 1990.<br>**Recommended:**<br>　1.　J. N. Reddy, Mechanics of laminated composite plates, Theory and analysis, CRC Press, 1997.<br>　2.　L. A. Samuelson, S. Eggwertz, Shell stability handbook, Elsevier, 1992.<br>　3.　J.N Reddy, Theory and analysis of elastic plates, CRC Press, 1999.<br>　4.　M. Farshad, Design and analysis of shell structures, Kluwer, 1992.<br>　5.　E. Ramm, A. Matzenmiller, Consistent linearization in elasto-plastic shell analysis, Eng. Comput., 5, 289-299, 1988.<br>　6.　A. Ibrahimbegović, F. Gruttmann, A consistent finite element formulation of nonlinear membrane shell theory with particular reference to elastic rubberlike material, Finite Elements in Analysis and Design, 12, 75-86, 1993.<br>　7.　B. Brank, J. Korelc, A. Ibrahimbegović, Dynamics and time-stepping schemes for elastic shells undergoing finite rotations, Computers and Structures, 81, 1193-1210, 2003. |

| Course: Structural reliability | | Status: optional | Code: TM-645 |
|---|---|---|---|

**Lecturer: Goran Turk**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | To learn basics of reliability of structures. |
| **Topics** | Probabilistic models of load and strength variables. |
| | Order statistics and extreme value theory – important probability distribution in structural analysis such as Gumbel, Weibull and Frechet distributions. |
| | Basic analysis of structural safety: the definition of characteristic values, safety factors, reliability index and probability of failure. |
| | Basic structural reliability problem: determination of probability of failure, i.e. probability that the load variable exceeds the resistance variable. |
| | First-order second-moment method (uncorrelated variables, correlated normally distributed variables, arbitrary multivariate distribution), Hasofer-Lind method, Rosenblatt transformation. |
| | Monte Carlo methods, basic (naive) simulations, variance reduction techniques, e.g. importance sampling, correlated variables, antithetic variables, etc. |
| | System reliability (serial and parallel systems), bounds on reliability of systems, first and second order bounds. |
| | Time-dependent reliability analysis, stochastic random process, stationary process, Poisson process, stochastic fields. |
| **Student obligations** | To prepare a term-paper. Term-paper includes explanantion of the problem, methods used, numerical examples, and conclusions. |
| **Exam** | Oral presentation/defence of the term-paper. |
| **Assessment** | |
| **Literature** | **Essential:**<br>1. R.E. Melchers, Structural reliability Analysis and Prediction, John Wiley and Sons, 1999.<br>2. P. Thoft-Christensen, M.J. Baker, Structural Reliability Theory and its Applications, Springer-Verlag, 1982.<br>3. J. Benjamin, C.A. Cornell, Probability, Statistics, and Decision for Civil Engineers, McGraw-Hill, 1970.<br>**Recommended:**<br>1. A. H.-S. Ang, W. Tang, Probability Concepts in Engineering Planning and Design, John Wiley and Sons, 1975.<br>2. R. Y. Rubinstein, Simulation and the Monte Carlo Method, John Wiley and Sons, 1981.<br>3. P. Thoft-Christensen, Y. Morotsu, Application of Structural Systems Reliability Theory, Springer-Verlag, 1986. |

| Course: ANALYSIS AND IMPROVEMENT OF TIMBER STRUCTURES | Status: optional | Code: NK-631 |
|---|---|---|

**Lecturer:** Adriana Bjelanović

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | To acquire advanced knowledge about timber structures. Scientific research and upgrading in this field could make possible improvement in design, construction and maintenance of special wooden structures and timber structures under special circumstances. |
| **Topics** | Spatial timber structures: parametrical studies, safety analysis<br>Safety analysis of elements and joints of timber structures: aspects of bearing capacity, serviceability, durability and fire - fighting safety<br>Modern variants of joints and strengthening of elements of timber structures: safety analysis<br>Safety analysis of elements and joints during dynamics loading: fatigue<br>Timber structures of special purpose: silos, reservoirs, telecommunication structures, timber columns foundations, supporting walls, sound barriers on highways, innovative structural systems of formworks and scaffolds<br>Timber structures in aggressive areas<br>Testing of timber structures using test loading "in situ"<br>Applications of AI techniques in design of timber structures: numerical models, expert systems, neural networks |
| **Student obligations** | Making of seminar paper based on chosen topics. |
| **Exam** | Seminar paper elaboration accompanied by a lecturer-student discussion. |
| **Assessment** | Results of grades of the seminar paper. |
| **Literature** | **Essential:**<br>Blass, H. J., Aune, P., Choo, B. S., Gorlacher, R., Griffits, D. R., Hilson, B. O., Racher, P., Steck, G.: Timber Engineering STEP 1, *Basis of design, Material properties, structural components and joints,* 1st, Edition, Centrum Hout, The Netherlands, 2004.<br>Blass, H. J., Aune, P., Choo, B. S., Gorlacher, R., Griffits, D. R., Hilson, B. O., Racher, P., Steck, G.: Timber Engineering STEP 2, *Design, Details and Structural Systems*, 1st, Edition, Centrum Hout, The Netherlands, 2004.<br>Götz, K., Hoor, D., Möhler, K., Natterer, J.: *Holzbau Atlas,* Institute für International Architecture - Dokumentation, GmbH, München, 1978.<br>**Recommended:**<br>Aune, P.: *Timber Structures Example,* Tapir Publisher, Trondheim, 1994.<br>Kordina, K., Mayer-Ottens, C.: *Holz Brandschutz Handbuch*, 1994.<br>Droge, G. : *Holzmastenbauart Kap. 20 aus Holzbau Tachenbuch, 8. Auflage, Band 1*, Verlag Ernst & Sohn, Berlin, 1986.<br>Stalnaker, J. J., Harris, E. C.: Structural Design in Wood, Van Nostrand Reinhold, 115 Fifth Avenue, NY, 1989.<br>Halas, R. Scheer, C.: *Holzbau-Tachenbuch*, IES, Verlag, Berlin, 2000. |

| Course: DYNAMICS OF BRIDGES | | Status: optional | Code: NK-632 |
|---|---|---|---|

**Lecturer: Darko Meštrović**

| Course delivery | lectures | progress meetings | seminars | | | | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | 10 | | | | | |
| ECTS distribution | 0.5 | 0.5 | 4.0 | | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | Acquisition of progressive knowledge in research, design, construction and maintenance of bridges. |
| **Topics** | Object and history of the dynamics of bridges; Vibrations induced by traffic; Theoretical bridge models; Modelling of vehicles – moving vertical forces; Mass elements, springs and damping elements; Influence of vehicle speed and mass on dynamic stresses of bridges; Mean wind load on bridge decks; Motion – induced wind load; Buffeting vibrations; Coupled flutter vibrations; Dynamic response to earthquakes, Bridge design on earthquake forces; Verification carrying capacity; Special rule of reinforcement of bars. |
| **Student obligations** | Seminar work. |
| **Exam** | Oral |
| **Assessment** | Seminar work and oral examination. |
| **Literature** | **Essential:** R.W. Clough, J. Penzien: Dynamics of structures, Mc Gran-Hill, 1993. E- Simiu, R.H., Scanlan: Windefect of structures, J. Wiley&Sons, 1996. A.K. Chopra, Dynamics of structures – Theory and applications to earthquake Engineering, Clifs, New Jersey, 1995. **Recommended:** C.M. Harris: Shock vibration, Mc Graw-Hill, 1988. C. Dyrbye, S.O. Hansen: Wind loads on structures, J. Wiley & Sons, 1997. Eurocode 8-2 |

| Course: Bearing and usability models for corrosion-affected concrete structures | Status: optional | Code: NK-633 |
|---|---|---|

**Lecturer: Darko Meštrović (collaborator Davor Grandić)**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
|---|---|---|---|---|---|---|---|
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4.0 | 1.5 | | | |

**ECTS total: 6**

| | |
|---|---|
| **Course objectives** | Assessment of residual bearing capacity and usability of a corrosion-affected concrete structure should be performed to determine residual service life of the structure and to estimate of timing for repairing or replacing of the structure or its element.<br>To provide systematic and sufficiently reliable assessment, appropriate models for assessment of residual bearing capacity and usability are used. Course objectives are to learn about current knowledge level in the area of corrosion-affected concrete structures research and to understand i models for assessment of residual bearing capacity and usability of such structures. Acquired knowledge is a base for student's further scientific research. |
| **Topics** | 11. About reinforcement steel corrosion and corrosion parameters<br>12. Corrosion progress over time<br>13. Concrete structure damage due to reinforcement steel corrosion<br>14. Introduction to assessment of residual service life of a corrosion-affected concrete structure<br>15. Overview of experiments and experimental results so far<br>16. Current procedures and models for assessment of residual bearing capacity and usability of a corrosion-affected concrete structure<br>17. Constitutive models of materials as a function of reinforcement steel corrosion level<br>18. Calculation procedures for boundary usability condition (deflection and crack) of a corrosion-affected concrete structure<br>19. Residual bearing capacity of a corrosion-affected concrete structure<br>20. Ductility of a corrosion-affected concrete structure |
| **Student obligations** | To prepare and present a seminar work. |
| **Exam** | By submission and presentation of the seminar. |
| **Assessment** | Based on the quality of the seminar, its presentation and discussion. |
| **Literature** | **Essential:**<br>1. CONTECVET, A validated users manual for assessing the residual life of concrete structures – Manual for assessing corrosion-affected concrete structures, Instituto Eduardo Toroja, EC innovation programme IN30902I, Madrid, 2000.<br>2. Service-Life Prediction – State-of-the-Art Report, ACI 365.R-00, ACI Committee 365, American Concrete Institute, 2000.<br>3. Broomfield, J. P.: Corrosion of Steel in Concrete, Understanding, Investigation and Repair, E&FN Spon, London, 1997.<br>4. CEB-FIP Model Code 1990 (MC-90), Design Code, Comité Euro-International du Béton (CEB), Thomas Telford Services Ltd., London, 1993.<br>5. CEB Design Manual on Cracking and Deformations, Bulletin D'Information N° 158E, Comité Euro-International du Béton (CEB), Laussanne 1985.<br>**Recommended:**<br>1. Li, C. Q.: Initiation of Chloride-Induced Reinforcement Corrosion in Concrete Structural Members–Experimentation, ACI Structural Journal, 98 (2001) 4, 502-510.<br>2. Mangat, S.P.; Elgarf, M.S.: Flexural Strength of Concrete Beams with Corroding Reinforcement, ACI Structural Journal 96 (1999) 1, 149-159. |

| | 3. Al-Sulaimani, G. J.; Kaleemullah, I. A.; Basunbul, I. A.; Rasheeduzzafar: Influence of Corrosion and Cracking on Bond Behaviour and Strength of Reinforced Concrete Members, ACI Structural Journal, 87 (1990) 2, 220-231. |
| | 4. Bjegović, D.; Durability design for reinforced concrete structures, sixth CANMET/ACI International Conference on Durability of Concrete / V.M. Malhotra (ur.), ACI Inernational, Greece, Thessaloniki, 2003, 737-75. |
| | 5. Shimomura, T.; Maruyama, K.: Constitutive models for prediction of performance of deteriorated concrete structures, 2nd International RILEM Workshop on Life Prediction and Aging Management of Concrete Structures, Paris, 2003, 3-12. |
| | 6. Cairns, J.; Plizzari, G. A.; Du, Y.; Law, D. W.; Franzoni, C.: Mechanical Properties of Corrosion-Damaged Reinforcement ACI, Materials Journal, 102 (2005) 4, 256-264. |
| | 7. Palsson, R.; Mirza, S.: Mechanical Response of Corroded Steel Reinforcement of Abandoned Concrete Bridge, ACI Structural Journal, 99 (2002) 2, 157-161. |
| | 8. Grandić, D.; Bjegović, D.; Banić, D. I.: Residual Structure Service Life Depending on Steel Corrosion Rate, Global Construction: Ultimate Concrete Opportunities, Application of Codes, Design and Regulations, Dundee, Scotland, 2005, 195-202. |
| | 9. Grandić, D., Bjegović, D.: Structural Deterioration due to Chloride-Induced Reinforcement Corrosion, Seventh CANMET/ACI International Conference on Durability of Concrete, Montreal, Canada 2006. |

| Course: Structural damage assessment using non-destructive methods | Status: optional | Code: NK-634 |
| --- | --- | --- |

**Lecturer: Ivica Kožar (collaborator Ivana Štimac)**

| Course delivery | lectures | exercises | seminars | progress meetings | coursework | preliminary exams | - |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Number of hours | 15 | | | 10 | | | |
| ECTS distribution | 0.5 | | 4 | 1.5 | | | |

**ECTS total: 6**

| | |
| --- | --- |
| **Course objectives** | Nondestructive damage detection (NDD) is an important subproblem of damage assessment and should form the basis of any decision to repair, rehabilitate, or replace a structure. The main course objectives are to give an insight into nondestructive methods for locating and evaluating damage severity and point out advantages and disadvantages of the methods. |
| **Topics** | 1. Nondestructive techniques and equipment for measuring static and dynamic parameters<br>2. Review of static and dynamic nondestructive damage detection methods<br>3. Assessment of defects in structures from measurements of natural frequencies (first-order perturbation of the eigenvalue problem)<br>4. Assessment of defects in structures from measurements of natural frequencies (nonlinear perturbation theory)<br>5. Structural damage detection using changes in the mode shapes<br>6. Structural damage detection strain energy damage detection method<br>7. Damage detection in structures from changes in flexibility<br>8. Damage detection in structures using frequency response function methods<br>9. Structural damage detection by static measurement<br>10. Structural Damage Assessment with Combined Data of Static and Modal Tests<br>11. Damage detection using deflection influence lines and deflection influence surfaces |
| **Student obligations** | To prepare and present a seminar work. |
| **Exam** | By submission and presentation of the seminar. |
| **Assessment** | Based on the quality of the seminar, its presentation and discussion. |
| **Literature** | **Essential:**<br>1. Cawley, P., Adams, R. D.; "The location of defects in structures from measurements of natural frequencies", Journal of Strain Analysis, Vol. 14, No 2, pp. 49-57, 1979.<br>2. Štimac, I., Uporaba utjecajnih linija progiba u otkrivanju oštećenja konstrukcija, Disertacija, Split, 2006.<br>3. Pandey, A. K., Biswas, M., Samman, M.: "Damage detection from changes in curvature mode shapes", Journal of Sound and Vibration, Vol. 145, No. 2, pp. 321-332, 1991.<br>4. Abdo, M. A.-B., Hori, M. "A numerical study of structural damage detection using changes in the rotation of mode shapes", Journal of Sound and Vibration, Vol. 251, No. 2, pp. 227-239, 2002.<br>5. Maia, N. M. M., i drugi, "Damage detection in structures: from mode shape frequency response function methods", Mechanical Systems and Signal Processing, Vol. 17, No. 3, pp. 489-498, 2003.<br>6. Cornwell, P, i drugi, "Application of the strain energy damage detection method to plate-like structures", Journal of Sound and Vibration, Vol. 224, No. 2, pp. 359-374, 1999.<br>7. Radić, J., Mekjavić, I.; "Identifikacija oštećenja mostova primjenom teorije nelinearne preturbacije", Građevinar, broj 57, str. 11-19, 2005.<br>**Recommended:**<br>1. Hassiotis, S., Jeong, G. D; "Assessment of Structural Damage From Natural Frequency Measurements", Computers & Structures, Vol. 49, No 4, pp. 679-691, 1993.<br>2. Bicanic, N., Chen, H. P.:"Damage identification in framed structures using natural frequencies ", International Numerical Methods in Engineering, Vol.40, No. 23, pp. 4451-4468, 1997.<br>3. Abdel Wahab, M. M., "Damage detection in bridges using modal curvatures: application to a real damage scenario", Journal of Sound and Vibration, Vol. 226, No. 2, pp. 217-235, 1999.<br>4. Bicanic, N., Chen, H. P.:"Damage identification in framed structures using natural frequencies ", |

| | International Numerical Methods in Engineering, Vol.40, No. 23, pp. 4451-4468, 1997. |
| | 5. Abdel Wahab, M. M., "Damage detection in bridges using modal curvatures: application to a real damage scenario", Journal of Sound and Vibration, Vol. 226, No. 2, pp. 217-235, 1999. |

### 3.4.2. Explanation of credits according to ECTS

It is envisaged that an academic year should consist of a total of 42 working weeks, each consisting of 40 working hours. During a full-time academic year the students (regardless of the programme of study) earn a minimum of 60 credits. The calculation of the number of hours that make one credit according to the afore-mentioned would be as follows:

1 credit = 42 (weeks) x 40 (working hours a week) / 60 credits = 1,680 hours / 60 credits = 28 hours

**1 credit is equivalent to the student workload of 28 hours.**

**The number of credits allocated to each particular course** is calculated in a manner that the complexity of the course programme and all general and specific student obligations related to successfully passing the course are taken into account:

- General obligations: time required for course attendance, preparation for exams, taking exams, consultations and the volume of required literature that must be studied to prepare for exams.
- Specific obligations: time required to prepare and take preliminary exams, creation of the programme of study, drawing up seminar papers, lab exercises, and other.

**The coefficient of course workload is defined in accordance with the share of the course workload in the total semester workload** in a manner that the student earns 30 credits during each semester. Research activities have also been measured in ECTS in the sense that any particular obligation in the research process is weighted in terms of its complexity in a manner defined in Section 3.3. In a similar way have been also treated the study activities related to teaching and knowledge transfer.

### 3.4.3. Method of monitoring the quality and effectiveness of course delivery

Continuous monitoring of the quality of course delivery is planned through various forms of evaluations and self-evaluations of both students and professors.

The evaluations of course delivery and professors will be conducted by course lecturers (professors) in cooperation with the Faculty body responsible for monitoring and promotion of the quality of the study programme.

**Various methods and procedures will be used to monitor and evaluate the quality of teaching and the effectiveness of course delivery:**

- **Surveys and interviews with students in regards to all aspects of the teaching process:**

    o **Regularity and organization of course units,**
    o **Literature,**
    o **Methods of improving the quality of teaching,**
    o **Exams,**
    o **Communication and cooperation with lecturers,**
    o **Course programme and methodology of delivery.**

- **Public presentation of results obtained on the basis of surveys and interviews,**
- **Analysis of the examination system (performance, transparency, objectivity, and similar).**

The evaluation of the quality of course delivery in respect of individual courses shall be carried out twice during one semester: 3-4 weeks after the beginning of the semester and during the last week of the semester. The results of the first evaluation can have a direct influence on the improvement of the teaching process in the following semester.

All surveys and interviews shall be conducted on the basis of forms prepared beforehand in which the course lecturers shall have an opportunity to adjust the questions to their specific course programme, methodology of teaching and other specific demands related to a particular course.

The course lecturer shall independently and/or in coordination with the responsible staff of the Faculty (and the relevant bodies responsible for monitoring and promotion of quality) draw up a plan of measures for improving the teaching and, therefore, learning quality in respect of each particular course.

## 3.5.    DYNAMICS OF THE STUDY PROGRAMME AND STUDENT OBLIGATIONS

### 3.5.1.   Dynamics of the study programme

The dynamics of the study programme is seen from the table given in Section 3.1. in which the schedule of study obligations for both full-time and half-time students is given.

### 3.5.2.   Student obligations

The obligations of students are defined on the basis of the existing rules and regulations, mainly on the basis of the University of Rijeka Study Regulations (see Appendix B), and the courses programmes as envisaged in the overall study programme (Section 3.4. entitled Course Descriptions). Special obligations shall be defined on the basis of the Faculty Study Regulations.

### 3.5.3.   Requirements for registration for next semester

| Semester | Registration requirements |
|---|---|
| 1 | – Enrolment requirements (Section 2.5.) |
| 2 | – |
| 3 | – All compulsory exams passed (30 credits) |
| 4 | – Successful defence of the previously registered dissertation topic (15+5 ECTS bodova)<br>– All optional exams passed (18 ECTS credits) |
| 5 | – Prepared and submitted dissertation (40 ECTS credits) |
| 6 | – Dissertation content passed by the Examination board and approved by the Faculty Council (10 ECTS credits)<br>– Published or accepted for publication an original scientific paper in a foreign periodical indexed in Current Contents, Science Citation Index or Science Citation Index Expanded in which the student is the main author (30 ECTS credits) |

NAPOMENA: To register for each new semester the student must verify the preceding semester.

| Dissertation defence | – All study obligations appart from the dissertation defence fulfilled (170 ECTS credits, of which at least 20 credits have been acquired on another university or research institution) |
|---|---|

## 3.6.  STUDENT COUNSELLING AND PROFESSIONAL GUIDANCE SYSTEM

At the enrolment in the study programme the student **chooses and registers a supervisor** from the list of professors of postgraduate educational studies, who is then appointed by the Postgraduate Studies Committee as the student's **counsellor**. Within the period of two semesters in the case of the full-time students, and no later than by the end of the fourth semester in the case of the half-time students, the Faculty Council must confirm the student's choice of **counsellor and supervisor** who takes upon himself/herself the responsibility of providing professional guidance to the students in the preparation of the doctoral dissertation.

In consultation with his/her counsellor, the student can propose to the Postgraduate Studies Committee another professor of postgraduate education or some other recognized expert outside the staff for the position of supervisor. At the suggestion of the Postgraduate Studies Committee, the Faculty Council must, within the period of two semesters in the case of the full-time students, and no later than by the end of the fourth semester in the case of the half-time students, **confirm** the student's choice of supervisor, and if the chosen professor does not belong to the Faculty's staff, the Faculty Council must appoint to the student a co-supervisor from the staff. The Faculty Council may appoint a co-supervisor to the student in other cases as well if it deems such an act beneficial for the student in the course of the study programme.

The counsellor helps the student create the programme of the doctoral study that is he/she plans the dynamics of taking exams from the first semester together with the student, instructs him/her how to choose the study obligations from the second semester in the case of the full-time students or for the second year of study in the case of the half-time students, and plans together with them the manner of fulfilling these obligations. The counsellor also advises the student to undertake self-study of relevant topics of particular graduate courses if they consider the student's knowledge not to be at the level necessary for unimpeded reception of the doctoral courses.

The supervisor directs the students to use appropriate literature and apply appropriate scientific research methods related to the mutual field of research. The supervisor also helps the student choose and precisely define the doctoral dissertation topic and is responsible for providing the student with professional guidance during the creation of the doctoral dissertation as well as to make contacts with the university and scientific institutions where the student must complete a part of his study obligations, as described in Section 3.1. Twice a year (January and July) the supervisor alone or with the help of the counsellor or counsellor alone (depending on the fact whether a supervisor has already been appointed to the student or the counsellor and supervisor are one and the same person) submits to the Dean or, in the case the Dean is the supervisor, to the Faculty Council the **Student Progress Report**. If the Faculty Council so decides, the student progress reports shall be submitted to the Dean at the session of the Postgraduate Studies Committee at the end of each semester. The report gives a concise evaluation of the student's work during the preceding six months, his/her progress in the framework of the overall study programme, and the estimated dynamics of the further course of study. The report should highlight the special achievements of the student or present his/her shortcomings together with the recommendations on how to improve the same, as well as possible instances of disloyalty or disregard of the University's Code of Ethics.

If the report is negative, the student should be made aware of that fact before the report is submitted to the Dean or the Faculty Council in order to have a chance to have a say in the matter. If the Dean or the Faculty Council receives a negative student progress report, the Vice-Dean for Postgraduate Studies is appointed to, in cooperation with the student's supervisor and counsellor, establish a three-member work

group for the purpose of creating a plan for the following six months and monitor the progress of the student within that period by holding regular monthly meetings between the members of the work group and the student. If the student's supervisor is at the same time his counsellor, the student's co-supervisor is appointed as the third member of the work group. If the co-supervisor had not been appointed yet, another member of the Postgraduate Studies Committee is appointed as the third member of the work group. The progress report that is made at the end of the monitored six months must be presented to the student in order to give him/her a chance to speak out on their behalf, and then submitted to the Faculty Council jointly by all members of the work group. If the Faculty Council receives at its session at the end of the semester yet another negative report, the termination of the process of earning a doctoral degree in the case of the particular student shall be initiated at once.

## 3.7.    LIST OF EXTERNAL COURSES

The optional courses of a maximum value of 18 credits can also be selected from the doctoral study programmes in respective branches of the scientific fields of Civil Engineering and Other Core Technical Sciences at other faculties with which the Faculty fosters cooperation in scientific research or educational activities. Among these there are the Technical Faculty of the University of Rijeka, the Faculty of Civil Engineering of the University of Zagreb and the Faculty of Civil and Geodetic Engineering of the University of Ljubljana. The students shall be offered a number of courses from other faculties as well as courses held by visiting professors after the course programmes of the same have been evaluated and approved.

## 3.8.    LIST OF COURSES AND FIELDS OF STUDY THAT CAN BE DELIVERED IN FOREIGN LANGUAGES

| NUMBER | CODE | COURSE | FOREIGN LANGUAGE |
|--------|------|--------|------------------|
| 1. | H-611 | Analysis and modelling of hydrological processes | English |
| 2. | H-612 | Modelling of hydrodynamic and transport processes in marine environment | English, Italian |
| 3. | H-613 | Coastal processes and engineering | English |
| 4. | H-617 | Modelling of aquatic eco-systems | English |
| 5. | H-618 | Modelling of transport and mixing processes | English, Italian |
| 6. | H-619 | Ecohydrology | English |
| 7. | M-671 | Applied higher mathematics | English |
| 8. | MK-621 | Numerical methods in engineering | English, German |
| 9. | MK-623 | Mechanics of quasi-brittle materials | English, German |
| 10. | MK-625 | Modelling of structures | English, German |
| 11. | TM-641 | Fundamentals of non-linear mechanics | English |
| 12. | TM-642 | Algorithmic preservation of material properties | English |
| 13. | TM-644 | Plates and shells | English |
| 14. | TM-645 | Structural reliability | English |

## 3.9.    CRITERIA AND CONDITIONS FOR TRANSFERRING CREDITS ACCORDING TO THE EUROPEAN CREDIT TRANSFER SYSTEM

The student who registers in the framework of the doctoral study programme for a course from a different postgraduate doctoral study programme within or outside the University and fulfils all his/her study obligations related to that course shall be allocated as many credits according to the European Credit

Transfer System as would a doctoral student of the institution in question be allocated under the same conditions.

## 3.10. COMPLETION OF THE STUDY PROGRAMME AND CONDITIONS FOR DOCTORAL DISSERTATION TOPIC REGISTRATION

The study program is completed when all exams are successfully passed, all other study obligations fulfilled and the doctoral dissertation written and publicly defended before the Doctoral Dissertation Defence Committee. The process of registering, evaluating and defending of the doctoral dissertation is regulated more precisely by the Statute of the University and the Study Regulations.

The student must submit an application for acceptance of the chosen dissertation topic, or a Letter of Intent, in consultation with his/her supervisor at the beginning of the third semester of the doctoral study programme. The application or the Letter of Intent must contain the title of the dissertation, a review of the scientific field the topic and field of research were taken from, the purpose and objectives of the proposed research, an elaboration of the working hypothesis and theses, the scientific methods that will be applied, a draft table of contents, expected contribution to the scientific thought, the way in which the results and findings of the research could be applied, a list of reference literature and other sources. The application should both in its form and content unequivocally demonstrate that the candidate is capable of an independent research basd on the scientific methodology.

The student must publicly defend the proposed topic of his/her doctoral dissertation before the relevant committee appointed by the Faculty Council, the supervisor and the Vice Dean for Postgraduate Studies. The committee has to make sure that (i) the proposed topic is at the level desired for the doctoral study both in its content and scope in such a way as to make an original research at the internationally accepted doctoral standards possible and (ii) that the particular candidate with their academic qualities and acquired knowledge is capable of carrying out this research under a suitable academic supervision. On the basis of the content of the Letter of Intent and the evaluation of the defence, the committee submits a report to the Faculty Council within three months from the date the Letter of Intent was submitted. Among other, the report must contain a conclusion stating the grade of the proposed topic and the defence of the same, as well as the arguments in favour of the given grade and a recommendation for the Faculty Council.

The Faculty Council is obligated to reach a decision concerning the proposed topic of the doctoral dissertation within six months since the day the Letter of Intent was submitted. At the suggestion of the Doctoral Dissertation Topic Evaluation Committee, the Faculty Council may request from the student to improve his/her Letter of Intent. If the Committee gives a negative grade to the proposed topic even after it has been improved and fine-tuned, the Faculty Council shall reach the decision on terminating the process of obtaining a doctoral degree in the case of the student in question, and inform him/her accordingly.

After the completion of the doctoral dissertation and fulfilling all other doctoral study obligations, the student submits a written application for evaluation of his/her doctoral dissertation to the Secretary for Postgraduate Studies. Together with the application the student must enclose his/her Letter of Intent, a written certificate issued by his/her supervisor confirming that the dissertation meets the prescribed criteria, three unbound copies of the doctoral dissertation, a CD with overall content of research conducted in the preparation of the doctoral dissertation, his/her curriculum vitae, the student's course and grade book, a short summary of the doctoral dissertation (20-30 lines), and a copy of the article thematically related to the topic of the doctoral dissertation published in one of the specialized journals. The article in which the student, as the chief editor, presents the results and findings of **his/her** entire

**research** conducted during the preparation of the doctoral dissertation or a part of it must be published (or approved to be published which must be verified by the publisher) in a foreign periodical indexed in Current Contents, Science Citation Index or Science Citation Index Expanded. The doctoral dissertation may be written in English or some other generally accepted language of communication in the chosen scientific research field. In accordance with article 63. of the University Study Regulations the dissertation may be submitted for examination in a traditional form or it may be based on the published scientific papers (Scandinavian model).

The doctoral dissertation is evaluated and graded by the Doctoral Dissertation Evaluation Committee comprised of an uneven number of members from the scientific or educational domains, recognized experts in the field from which the doctoral dissertation topic was taken, of whom at least one is from some other university or scientific institution. The Doctoral Dissertation Evaluation Committee is appointed by the Faculty Council. The Committee must submit its report and grade concerning the doctoral dissertation no later than within three months since it was received. The report made by the Committee must contain a conclusion in which the scientific contribution of the doctoral dissertation is clearly worded. If the Faculty Council considers that the report submitted by the Doctoral Dissertation Evaluation Committee does not give a sufficient basis for reaching a decision on the grade of the doctoral dissertation, it may appoint new members to the Doctoral Dissertation Evaluation Committee or form an entirely new Doctoral Dissertation Evaluation Committee that would then evaluate and grade the doctoral dissertation once more and submit a new report. At the suggestion of the Doctoral Dissertation Evaluation Committee the Faculty Council may request from the student to improve and fine-tune his/her dissertation. If the Faculty Council receives yet another negative report even after the dissertation has been improved and fine-tuned, it then reaches a decision on terminating the process of obtaining a doctoral degree in the case of the student in question and informs him/her accordingly. When the Faculty Council receives a positive report on the doctorate dissertation at its session, it appoints a Doctoral Dissertation Defence Committee that consists of the members elected under the same conditions as in the case of the members of the Doctoral Dissertation Evaluation Committee.

The defence of the doctoral dissertation is held no later than within two months from the day the dissertation was accepted by the Faculty Council. The doctoral dissertation must be made available to the public at least fifteen days prior to defence of the same, and published at least eight days before. The defence of the doctoral dissertation is also public. After the doctoral dissertation has been defended, the Doctoral Dissertation Defence Committee reaches a decision on the results of the doctoral dissertation defence which is publicly announced and contains a reference stating whether the student has successfully defended his/her doctoral dissertation on the basis of a unanimous decision by the committee or a majority of votes, or whether he/she has failed in defending the doctoral dissertation. Doctoral dissertations can be defended only once.

### 3.11. CONDITIONS FOR OBTAINING PERMISSION TO CONTINUE THE STUDY PROGRAMME IN THE CASE OF FORMER STUDENTS

The students who terminated the doctoral study programme are allowed to reapply provided that they accepts all the changes that occurred in the programme of study during their absence. All successfully passed exams, completed courses and obligations prior to termination of the doctoral study programme that correspond to those of the current programme of study shall be recognized. The Postgraduate Studies Committee decides which courses and obligations correspond to the currently valid programme.

### 3.12. CONDITIONS FOR OBTAINING A CERTIFICATE FOR SUCCESSFULLY COMPLETED COMPONENT(S) OF THE DOCTORAL PROGRAMME

A doctoral student has the right to obtain a certificate for the successfully completed component(s) of the doctoral study programme, as part of the lifelong learning process. The request for issuing such a certificate that states the specific component of study programme for which the certificate is needed and the student's course and grade book are submitted to the Secretary for Postgraduate Studies or the person responsible for secretarial work. On the basis of the insight into the degree of fulfilled obligations related to the request, the Secretary or some other relevant person, prepares a decision that is passed onto the Postgraduate Studies Committee at the session where the certificate is confirmed. The certificate contains a list of fulfilled study obligations and a number of credits earned. In the case the fulfilled study obligations create a logical whole, a completed study programme component, the certificate for the completed component of the doctoral programme may include the name of the completed component in its title and wording.

### 3.13.    CONDITIONS FOR EARNING A DOCTORAL DEGREE WITHOUT ATTENDING COURSES

The candidates with scientific achievements of a significance equivalent to the conditions for the scientific election according to the Regulations of the conditions for scientific election (NN 84/05), including at least three papers in scientific or scientific-professional periodicals thematically linked to the candidate's doctoral study programme, and which have spent at least one semester at a domestic or a foreign scientific institution and have attended at least two international scientific conferences, may be freed from attending the lectures and taking the exams on the basis of the relevant decision of the Faculty Council pending an approval of the University Senate. Such candidates thus start the study programme with granted ECTS 48.

### 3.14.    MAXIMUM DURATION OF STUDY

The student who has enrolled in the full-time doctoral study programme loses the status of a student if he/she does not fulfil the study obligations within six years since the day of enrolment. The student who has enrolled in the part-time doctoral study programme loses his/her status of a student if he/she does not fulfil the study obligations within ten years since the day of enrolment.

# 4. REQUIREMENTS FOR SUCCESSFUL DELIVERY OF THE PROPOSED STUDY PROGRAMME

## 4.1. REQUIRED FACILITIES

The Faculty of Civil Engineering of the University of Rijeka has a space in the building at 5 Viktor Car Emin St. in Rijeka, where the courses and activities envisaged in the proposed programme are to be held. It is envisaged that the Faculty moves to new facilities (approx 10,000 sq m) in January 2008 by which time the planned campus of the University of Rijeka shall be built on the premises of the former military base on Trsat.

## 4.2. INFORMATION ABOUT REQUIRED FACILITIES AND EQUIPMENT

**The Faculty of Civil Engineering in Rijeka has a space in the building at 5 Viktor Car Emin St. in Rijeka, where most of its activities and operations take place. The building of the Faculty was thoroughly renovated in 2003.**

The Faculty has **a new library** with a spacious reading room equipped with networked computers.
The **special computer laboratory** is equipped with new computers, which makes possible the delivery of educational activities in special laboratories.
The building also includes the **necessary and additional teaching equipment**. All classrooms are equipped with fixed projectors, which facilitates teaching (especially lecturing) with the help of computers. The students and professors may also use the photocopying service.
The Faculty also has the necessary sanitary facilities and a student mass, ensuring that the students have everything they need for an undisturbed study.
The curricular activities (exercises in the framework of certain courses) are partly held in the laboratories of the Croatian Institute of Civil Engineering in Rijeka and Zagreb, and the Faculty of Civil Engineering in Zagreb on the basis of long-term cooperation agreements. This enables better use of equipment and more favourable financial results. The laboratories are equipped with new, sophisticated devices.
There are in total 12 modernly equipped classrooms within the building (for 25-130 students) and a computer room with 30 working stations equipped with computers. The computer programs are regularly updated.
In numerical terms, and according to the current condition, there are 4 sq m per student (the total surface area of the building is 2,435 sq m).

**According to the University development plans and projects it is envisaged that all activities of the Faculty be moved to new facilities of 10,000 sq m in size, ensuring an optimum number of classrooms, laboratories and computer rooms to deliver the proposed programme, set within the University Campus on Trsat which shall be built by the academic year 2007/08.**

The orientation of the faculty is to equip own laboratories only for the economically and educationally viable activities, while for the other activities the laboratories of the partner institutions should be used. In this way equipment and staff are utilized in an economically sound way, the costs of maintenance are minimized and the bonds between research and industry are strengthened. The faculty is very well equipped for field-work in hydraulic engineering (with "small", "large" and induction-type hydrometric wings and a multiparameter device for measurement of the main indicators of the water quality) and can easily conduct high-quality "in situ" measurements as a basis for future investigation in the course of doctoral activities. When it comes to providing the necessary data, the faculty has an established

collaboratin with a variety of relevant institutions – the State Hydrometeorological Institute, the State Hydrographic Institute, the Croatian Geological Institute, the Oceanographic Institute etc.

### 4.3. LIST OF SCIENTIFIC AND DEVELOPMENT PROJECTS THE PROPOSED PROGRAMME IS BASED ON

The postgraduate study programme is based on scientific and development research conducted by the teaching staff that will teach the courses envisaged in the postgraduate study programme. The account of the relevant research projects is given in the curriculum vitae of each professor. Considering that certain projects were still in process at the moment of proposing this programme, the postgraduate study programme is based on the following scientific and development projects:

### 4.3.1 Scientific projects conducted by the Ministry of Science and Technology with professors of postgraduate education in the role of project leaders

**Teachers from the Faculty**

Čedomir Benac: Assessment, reduction and management of geologic hazard in the Kvarner region (scientific  project MZOS No. 114-0822695-2568)
Mehmed Čaušević: Development of structures with higher reliability in earthquakes (scientific  project MZOS No. 114-0821466-1470)
Gordan Jelenić: Improvement of accuracy of non-linear beams with finite 3D rotations(scientific  project MZOS No. 114-0000000-3025)
Vedrana Kozulić, Adaptive meshless modelling in design of civil engineering structures (scientific  project MZOS No.  083-0831541-1534)
Ivica Kožar: Flexible long structures: non-linear modelling with visulaization (scientific  project MZOS No. 114-0982562-1460)
Nevenka Ožanić: Hydrology of sensitive water resources in karst (scientific  project MZOS No. 114-0982709-2549)
Joško Ožbolt: Numerical 3D chemo-hygro-thermo-mechanical model of concrete (scientific  project MZOS No. 114-0000000-3145)
Boris Podobnik: Investigation of correlations and stochastic modelling at the cell level (scientific  project MZOS No. 114-0352827-1370)
Ivan Vrkljan, Investigation of mechanical properties of sheets in seal barriers (scientific  project MZOS No. 110-0831529-1517)

**Visiting professors**

Julijan Dobrinić: Investigation of methods to suppress sea pollution from the marine technology (scientific project MZOS No. 069-0691668-3007)
Ognjen Bonacci: Investigation of extreme hydrological situations and water risks in karst (scientific project MZOS No. 083-0831510-1511)

### 4.3.2. Scientific projects conducted by the Ministry of Science and Technology with professors of postgraduate education in the role of associate experts

**Teachers from the Faculty**

Željko Arbanas, Investigation and modelling of improved soil and rock (scientific project MZOS No. 082-0822161-2187; project leader Meho-Saša Kovačević, Faculty of Civil Engineering of the University of Zagreb)

Gojko Balabanić: Flexible long structures: non-linear modelling with visulaization (scientific project MZOS No. 114-0982562-1460; project leader Ivica Kožar)

Gojko Balabanić: Numerical 3D chemo-hygro-thermo-mechanical model of concrete (scientific project MZOS No. 114-0000000-3145; project leader Joško Ožbolt)

Čedomir Benac: Erosion and landslides as a unique geohazardous event (scientific project MZOS No. 195-0000000-2233; project leader Vladimir Jurak, Faculty of mining and geology of the University of Zagreb)

Adriana Bjelanović: Composite systems timber-glass and timber-steel (scientific project MZOS No. 082-1491823-1463; project leader Vlatka Rajčić, Faculty of Civil Engineering of the University of Zagreb)

Mehmed Čaušević: Reliability of structures made from new materials (scientific project MZOS No. 082-0821466-1468; project leader Boris Androić, Faculty of Civil Engineering of the University of Zagreb)

Svjetlan Feretić: Discrete mathematics and applications (scientific project MZOS No. 037-0000000-2779; project leader Dragutin Svrtan, Faculty of Natural Sciences and Mathematics of the University of Zagreb)

Svjetlan Feretić: Discrete mathematical models in chemistry (scientific project MZOS No. 177-0000000-0884; project leader Damir Vukičević, Faculty of Natural Sciences, Mathematics and Kinesiology of the University of Split)

Barbara Karleuša: Hydrology of sensitive water resources in karst (scientific project MZOS No. 114-0982709-2549; project leader Nevenka Ožanić)

Ivica Kožar: Numerical 3D chemo-hygro-thermo-mechanical model of concrete (scientific project MZOS No. 114-0000000-3145; project leader Joško Ožbolt)

Leo Matešić: Assessment, reduction and management of geologic hazard in the Kvarner region (znanstveni scientific project MZOS No. 114-0822695-2568; project leader Čedomir Benac)

Leo Matešić: Development of system of management of geotechnical data to assess natural hazards (scientific project MZOS No. 195-1951825-1507; project leader Predrag Kvasnička, Faculty of mining and geology of the University of Zagreb)

Joško Ožbolt: Flexible long structures: non-linear modelling with visulaization (scientific project MZOS No. 114-0982562-1460; project leader Ivica Kožar)

Ivan Vrkljan: Underground pollution transport and risk assessment as a consequence of waste disposal (scientific project MZOS No. 083-0831529-1528; project leader Roko Andričević, Faculty of Civil Engineering and Architecture of the University of Split)

**Visiting professors**

Ognjen Bonacci: Water balance and drainage models in karst (scientific project MZOS No. 083-0831510-1513; project leader Vesna Denić-Jukić, Faculty of Civil Engineering and Architecture of the University of Split)

### 4.3.3. Development projects supported by local self-governmental bodies in cooperation with other ordering parties

Čedomir Benac: Condition of Natural Beaches in Primorsko-goranska County, Phase 1 (Beaches in the coastal region between the Žurkovo cove and the Klenovica community); municipality of Kostrena, Bakar, Kraljevica, Crikvenica and Novi Vinodolski; P-10 project of the Primorsko-goranska County.

### 4.3.4. Projects financed by other sources with professors of postgraduate education in the role of project leaders

Goran Turk, Associate Professor, Methods for Classification of Wooden Materials by Strength; Slovene Ministry of Education, Science and Sports; July 1, 2004 – June 30, 2007, L2-6147.

### 4.3.5. Projects financed by other sources with professors of postgraduate education in the role of associate experts

Boštjan Brank, Assistant Professor: E-Construction; Slovene Ministry of Education, Science and Sports; January 1, 2004 – December 31, 2008, P2-0210.
Zoran Ren, Associate Professor: *Programska raziskovalna skupina Inteligentno računalniško konstruiranje*; 2004-2009.

### 4.4. INSTITUTIONAL ADMINISTRATION OF THE DOCTORAL PROGRAMME

The main Faculty's body responsible for managing the proposed doctoral programme and controlling the quality of the same is the **Postgraduate Studies Committee**, the establishment of which is prescribed in Article 58 of the Study Regulations of the University of Rijeka (see Appendix B). A full-time position of a Secretary for Postgraduate Studies shall be formed.

The Postgraduate Studies Committee consists of the **Vice-Dean for Postgraduate Studies** who is also the chairman of the Committee responsible for convening and presiding the sessions of the Committee, the **Vice-Dean for Scientific and Research Activities**, and five professors of postgraduate education. At least two members of the Committee have to be from the ranks of the teachers holding courses in the subject area of hydraulics, two members of the Committee have to be from the ranks of the teachers holding courses in the subject area of geotechnics, and two members of the Committee have to be from the ranks of the teachers holding courses in the subject area of mechanics or structures. At the suggestion of the Dean the Faculty Council confirms the appointment of the committee members. The Committee convenes at least four times a year and, if necessary, invites the Dean or student supervisors to participate in the sessions. The recording secretary also attends the sessions of the Postgraduate Studies Committee and keeps minutes of the same.

Before the beginning of an academic year, the Postgraduate Studies Committee selects the candidates who meet the requirements for applying for the study programme on the basis of the provisions stated in Section 2.5, and make a further selection among them on the basis of the provisions of Section 2.6. At its sessions the Committee reviews the implementation of the programme and discusses problems related to the realization of the programme, which includes the planning of study visits of doctoral students to home or international university and scientific institutions. The Committee analyses the existing doctoral study programme on a continuous basis and presents the results of evaluations as well as the proposed changes that need to be made in the programme and how they should be introduced to the Faculty Council with a purpose of continuous improvement of the same (see Section 4.11). If the Faculty Council so decides, the supervisors may submit the regular reports to the Dean at the session of the Postgraduate Studies Committee at the end of each semester.

### 4.5. CONTRACTUAL RELATIONSHIP BETWEEN STUDENTS AND THE PROVIDER OF THE DOCTORAL STUDY PROGRAMME

After a candidate is granted to enrol in the postgraduate doctoral study programme, the Faculty of Civil Engineering of the University of Rijeka, as the provider and deliverer of the study programme, and the enrolled candidate sign a contract which regulates the relationship between the Faculty and the student. The provider of the study programme is responsible for drawing up of the contract proposal. The contract regulates the relationship between the provider of the study programme and the student in terms of their

rights and obligations (provider and deliverer of the programme: holding courses, appointing counsellors, supervisors, monitoring student progress throughout schooling, providing research opportunities, allocating the programme prescribed credits, making possible student study visits to other institutions and writing and defending of their doctoral dissertations etc.; the student: regular fulfilment of the prescribed obligations, working on earning the prescribed credits, fulfilment of financing obligations, obligations in accordance with the Study Regulations and the postgraduate study programme etc.). Full-time doctoral students who have signed a temporary work-study agreement with the Faculty in the capacity of assistants have all the rights and obligations that are prescribed to them on the basis of the Law and the legal acts of the University and Faculty.

A detailed content and type of contract shall be determined subsequently on the basis of the Regulations on the Postgraduate Student Contracts that shall be drawn up and adopted by the Faculty Council of the Faculty of Civil Engineering of the University of Rijeka.

## 4.6. NAMES OF PROFESSORS AND COLLABORATORS ENGAGED IN THE PROPOSED STUDY PROGRAMME

| Number | Professor/Course Lecturer | Course | Collaborator |
|---|---|---|---|
| 1. | Željko Arbanas | **Advanced theoretical soil mechanics,** Observational methods in geotechnical engineering | |
| 2. | Gojko Balabanić | Transport processes in concrete | |
| 3. | Prof. Čedomir Benac | Geotechnical aspects of waste disposal, Hazard in geotechnical engineering | |
| 4. | Adriana Bjelanović | Analysis and improvement of timber structures | |
| 5. | Ognjen Bonacci* | Eco-hydrology | |
| 6. | Boštjan Brank* | Plates and shells | |
| 7. | Julijan Dobrinić | Methodology of science and research | |
| 8. | Mehmed Čaušević | Earthquake engineering | |
| 9. | Svjetlan Feretić | **Applied higher mathematics (1/2)** | |
| 10. | Suzana Ilić* | Coastal processes and engineering | |
| 11. | Gordan Jelenić | **Fundamentals of nonlinear mechanics,** Algorithmic preservation of mechanical properties | |
| 12. | Barbara Karleuša | Contemporary approaches in water management | |
| 13. | Boris Kompare* | Modelling of aquatic eco-systems | |
| 14. | Zorko Kos | Karst hydrology, Management of hydro-melioration systems | Josip Rubinić |
| 15. | Vedrana Kozulić | Meshless numerical methods | |
| 16. | Ivica Kožar | **Numerical methods in engineering,** Modelling of buildings, Structural damage assessment using non-destructive methods | Ivana Štimac |
| 17. | Janko Logar* | Soil consolidation and creep | |
| 18. | Leo Matešić | Geotechnical modelling, Geotechnical aspects of earthquake engineering | |
| 19. | Darko Meštrović | Dynamics of bridges, Bearing and usability models for corrosion-affected concrete structures | Davor Grandić |
| 20. | Nevenka Ožanić | **Analysis and modelling of hydrological processes,** Application of remote sensing | Dražen Galić |
| 21. | Joško Ožbolt | Mechanics of quasi-brittle materials | |
| 22. | Boris Podobnik | **Applied higher mathematics (1/2)** | |
| 23. | Nenad Ravlić* | Modelling of hydrodynamical and transport processes in marine environment | |
| 24. | Zoran Ren* | Fracture mechanics | |
| 25. | Goran Turk* | Reliability of structures | |
| 26. | Ivan Vrkljan | Advanced soil mechanics | |

* External associate (statements and approvals in Appendix A).

| Name of teacher: | Željko Arbanas |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br>01.12.2002 |
|---|---|

| Title:<br>Since:<br>In: | Assistant Professor<br>11.06.2002<br>Geotechnical Engineering |
|---|---|

| e-mail address, web page | zarbanas@gradri.hr |
|---|---|

| Knowledge of foreign languages: | English, German |
|---|---|

| Qualifications | - **date of birth, nationality:** 20.07.1959, Republic of Croatia<br>- **First degree obtained at:** University of Rijeka, Department of Civil Engineering<br>- **Master degre obtained at:** University of Zagreb, Department of Civil Engineering<br>- **Ph.D. degree obtained at:** University of Zagreb, Department of Civil Engineering<br>- **additional education:**<br>- **previous employments:** Cesta Rijeka 1983-1986, University of Rijeka, Department of Civil Engineering 1986-2001, Civil Engineering Institute of Croatia, 1991-2005 |
|---|---|

| List of papers published in scientific journals | Arbanas, Ž., Benac, Č., Jardas, B., Marković, A.: "Geotehnički problemi proširenja Riječke luke", Zbornik radova I međ. konf. o složenim sustavima Luka kao složeni sustav, Suvremeni promet, Vol.14., No. 5-6., Zagreb, (1994), pp. 204-208.<br>Pavlovec, E., Benac, Č., Arbanas, Ž.: "Slijeganja priobalnog dijela grada Rijeke", Građevinar, 50, 4, (1998), pp. 203-208.<br>Arbanas, Ž.: "Izvedba građevne jame Zagrad u Rijeci", Građevinar 55 (2003) 10, pp. 591-597. |
|---|---|

| List of publications which serve as a proof of teaching qualifications | Benac, Č., Arbanas, Ž.: "Sedimentacija u području ušća Rječine", Pomorski zbornik, Vol.28., Rijeka, (1990), pp. 593-609.<br>Benac, Č., Arbanas, Ž., Pavlovec, E.: "Postanak i geotehničke osobitosti doline i zaljeva Raše", Pomorski zbornik, Vol.29., Rijeka, (1991), pp. 475-492.<br>Pavlovec, E., Arbanas, Ž., Galić, D., Benac, Č.: "Sedimentacijske i deformacijske značajke platoa južno od Starog grada u Rijeci", Pomorski zbornik, Vol.30., Rijeka, (1992), pp. 655-677.<br>Arbanas, Ž., Benac, Č., Jardas, B.: "Geotehničke značajke priobalnog područja grada Rijeke", Pomorski zbornik, Vol.32., Rijeka, (1992), pp. 467-480.<br>Pavlovec, E., Arbanas, Ž.: "Složene potporne konstrukcije na Lujzinoj cesti", Zbornik radova Građevinskog fakulteta u Rijeci, Vol. IX., Rijeka, (1992), 39-49.<br>Benac, Č., Arbanas, Ž. Jardas, B.: The morphogenesis and the evolution of the river mouths in the Kvarner area", Proc. Int. Symp. Geomorphology and Sea, Zagreb, (1992), pp. 37-45.<br>Arbanas, Ž., Benac, Č., Jardas, B.: "Utjecaj morfoloških, geoloških i geotehničkih osobitosti na prostorno planiranje i razvitak Općine Crikvenica", Vinodolski zbornik, No. VII., Crikvenica, (1993), pp. 77-85.<br>Plišić, I., Arbanas, Ž., Pilko, J., Mikuličić, J.: "Optimalizacija smještaja uređaja za pročišćavanje otpadnih voda u primorju", Zbornik radova kongresa Energija i zaštita okoliša, Vol. 2., Opatija, (1994), pp. 153-164.<br>Benac, Č., Jardas, B., Arbanas, Ž., Ilić, S.: "Zaštita žala na području Kvarnera", 14. Biennal International Congres, 2, Opatija, (1998), pp. 647-656.<br>Jardas, B., Ilić, S., Benac, Č., Arbanas, Ž.: "Beach Protection and Beach Recherge Design in Rijeka Bay (Croatia)", Proceedings of International Symposium on Water Menagement and Hydraulic Engineering, Dubrovnik 1998, 2; Zagreb, (1998), pp. 271-281.<br>Benac, Č., Arbanas, Ž., Jardas, B., Kasapović, S., Jurak, V.: "Složeno klizanje u dolini Rječine", Rudarsko-geološko-naftni zbornik 11, Zagreb, (1999), pp. 81-90.<br>Benac, Č., Arbanas, Ž., Jurak, V., Kasapović, S., Dujmić, D., Jardas, B., Pavletić, Lj.: "Klizište Grohovo - složeno klizanje u dolini Rječine", Zbornik radova 2. hrvatskog geološkog kongresa, Cavtat – Dubrovnik, Zagreb, (2000), pp. 517-525.<br>Arko-Pijevac, M., Benac, Č., Gržančić, Ž., Kovačić, M., Kirinčić, M., Arbanas, Ž.: "Initial Study on Proposed Protected Marine Area in the Municipality of Kostrena, Primorsko-Goranska County", Responsible Coastal Zone Menagement-The Challange of the 21th Century, Cavtat, (2000), Periodicum Biologorum, 102 (1), |
|---|---|

(2000), pp. 705.

Benac, Č., Jardas, B., Arbanas, Ž.: "Geotechnical Risk and Physical Planning on the Krk island", Proceedings of VII International Symposium on Water Menagement and Hydraulic Engineering, Miedzybrodzie Žywieckie, 10.-12.09., Poland, (2001), pp. 249-254.

Benac, Č., Arbanas, Ž., Jardas, B., Jurak, V., Kovačević, M.S.,: "Complex landslide in the Rječina River valley (Croatia): results and monitoring", In: Landslides, J.Ribar, J.Stemberk, & P.Wagner, eds., Proceedings of the 1th European Conference on Landslides, Prague, june 2002, A.A.Balkema, (2002), Lisse-Abingdon-Exton-Tokyo, pp 487-492.

Arbanas, Ž., Kovačević, M.S. and Jardas, B.: "Reinforcement Systems in Construction of Open Pit Zagrad in Rijeka, Croatia", Proc. XIII European Conf. on Soil Mech. and Geotech. Eng. Geotechnical Problems with Man-made and Man Influenced Grounds, Prague, Vol. 2., (2003), pp. 23-28.

Arbanas, Ž., Jardas, B., Kovačević,M.J.: "Excavation of Open Pit Zagrad in Rijeka, Croatia, A Case History", Proc. V. Int. Conf. on Case Histories in Geotechnical Engineering, New York 2004, Paper No. 5.64, (2004), pp. 1-6.

Arbanas, Ž., Benac, Č., Rubinić, J.: "The Geotechnical Properties of Sediment Body in the Estuary of the Raša River, Croatia", Proc. of Int. Conf. of Coastal Environment V, incorporating Oil Spill Studies, Alicante 2004, Spain, Ed. C.A. Brebbia, J.M. Saval Perez & L. Garcia Andion, WIT Press, Southampton, (2004),pp. 209-218.

Arbanas, Ž., Benac, Č., Jardas, B.: "Landslides in The Čabranka River Valley, Croatia", Proc. IX International Symposium on Landslides, Rio de Janeiro, Brasil, June 28–July 2, (2004).

Arbanas, Ž., Kovačević, M.S., Jardas, B.: "Geotechnical investigations on the Zagrad location in Rijeka, Croatia", Proc. ISC-2 on Geotechnical and Geophysical Site Characterization, Porto 2004, Portugal, Ed. A. Viana da Fonseca & P.W. Mayne, Millpress, Roterdam, Vol. 2, (2004), pp. 1415-1420.

| Leader of the following research projects | |
|---|---|

| Participant in the following research projects | 1. Monitoring podzemnih građevina; 2002-2005.<br>2. Željko Arbanas, Investigation and modelling of improved soil and rock (scientific project MZOS No. 082-0822161-2187; project leader Meho-Saša Kovačević, Faculty of Civil Engineering of the University of Zagreb) |
|---|---|

| Supervision of MSc theses | 0 |
|---|---|

| Supervision of PhD theses | 0 |
|---|---|

| Examination of MSc theses | 0 |
|---|---|

| Examination of PhD theses | 0 |
|---|---|

| Name of teacher: | Gojko Balabanić |
|---|---|

| Employed at: | University of Rijeka, Department of Civil Engineering |
|---|---|
| Since: | 1991. |

| Title: | Full professor |
|---|---|
| Since: | 2004 |
| In: | Materials |

| e-mail address, web page | gojko@gradri.hr, www.gradri.hr |
|---|---|

| Knowledge of foreign languages: | English, Italian, Russian |
|---|---|

| Qualifications | - **date of birth, nationality:** 13.11.1952., Republic of Croatia<br>- **First degree obtained at:** University of Zagreb, Department of Natural Sciences and Mathematics, 1975<br>- **Master degre obtained at:** University of Zagreb, Department of Natural Sciences and Mathematics, 1989<br>- **Ph.D. degree obtained at:** University of Zagreb, Department of Civil Engineering, 1993<br>- **additional education:**<br>- **previous employments:** Civil Engineering Institute Zagreb 1978 -1984. Civil Engineering Institute Rijeka 1984 -1991. |
|---|---|

| List of papers published in scientific journals | 1. Kostrenčić, Z., Bjegović, D., Balabanić, G.: Mathematical evaluation of the quality of repairs on concrete specimens, *Cement, Concrete and Aggregates*, **2** (1984) 177-182.<br>2. Mikulić, D., Ukrainczyk, V., Balabanić, G.: Dvostepena metoda za ocjenu tlačne čvrstoće betona u konstrukciji, *Tehnika - Naše građevinarstvo*, **38** (1984) 614-619.<br>3. Balabanić, G., Sokolić, F., Milčić, Rubčić, A.: Structure of liquids near solid interface determined by Monte Carlo simulation, *Farmaceutski Vestnik*, **38**(3) (1987) 187-194.<br>4. Balabanić, G., Borštnik, B., Milčić, R., Rubčić, A., Sokolić, F.: Monte Carlo simulation of a Lennard-Jones fluid near a hard and soft wall, *Static and Dynamic Properties of Liquids*, Springer Proceedings in Physics, Vol. 40., Eds.: M. Davidović and K. Soper, Heidelberg 1989, 70 - 76.<br>5. Balabanić, G., Borštnik, B., Milčić, R., Rubčić, A., Sokolić, F.: Study of solid-liquid interface by computer simulation, *Croatica Chemica Acta*, **4** (1989) 829-847.<br>6. Balabanić, G., Bićanić, N.: Modeliranje kretanja vode u betonskom uzorku, *Građevinar*, **46**(7) (1994) 389-393.<br>7. Balabanić, G., Bićanić, N., Đureković, A.: Matematičko modeliranje penetracije klorida kroz beton, *Kemija u industriji*, **44**(5) (1995) 211-217.<br>8. Balabanić, G., Bićanić, N., Đureković, A.: Numerical analysis of corrosion cell in concrete, *International Journal for Engineering Modelling*, **8**(1-2) (1995) 1-5.<br>9. Balabanić, G., Bićanić, N., Đureković, A.: The influence of w/c ratio, concrete cover thickness and degree of water saturation on the corrosion rate of reinforcing steel in concrete, *Cement and Concrete Research*, **26**(5) (1996) 761 - 769.<br>10. Balabanić, G., Bićanić, N., Đureković, A.: Mathematical modeling of electrochemical steel corrosion in concrete, *Journal of Engineering Mechanics*, **122**(12) (1996) 1113 - 1122.<br>11. Zhang, B., Bićanić, N., Pearce, C. J., Balabanić, G.: Residual fracture properties of normal and high strength concrete subject to elevated temperatures, *Magazine of Concrete Research*, **52**(2)(2000) 123-136.<br>12. Zhang, B., Bićanić, N., Pearce, C. J., Balabanić, G.: Assessment of Toughness of Concrete Subject to Elevated Temperatures from Complete Load – Displacement Curve – Part I: General Introduction, ACI *Materials Journal*, **97**(5)(2000) 550 –555.<br>13. Zhang, B., Bićanić, N., Pearce, C. J., Balabanić, G.: Assessment of Toughness of Concrete Subject to Elevated Temperatures from Complete Load – Displacement Curve – Part II: Experimental Investigations, ACI *Materials Journal*, **97**(5)(2000) 556 –566.<br>14. Zhang, B., Bićanić, N., Pearce, C. J., Balabanić, G.: Residual fracture properties of normal and high strength concrete subject to elevated temperatures, Discussion on paper, *Magazine of Concrete Research*, **53**(3)(2001) 221-224. |
|---|---|

| List of | 1. Balabanić, G., Bićanić, N.: Modeliranje kretanja vode u betonskom uzorku, *Građevinar*, **46**(7) (1994) 389- |
|---|---|

| publications which serve as a proof of teaching qualifications | 393. <br> 2. Balabanić, G., Bićanić, N., Đureković, A.: Matematičko modeliranje penetracije klorida kroz beton, *Kemija u industriji*, **44**(5) (1995) 211-217. <br> 3. Balabanić, G., Bićanić, N., Đureković, A.: Numerical analysis of corrosion cell in concrete, *International Journal for Engineering Modelling*, **8**(1-2) (1995) 1-5. <br> 4. Balabanić, G., Bićanić, N., Đureković, A.: The influence of w/c ratio, concrete cover thickness and degree of water saturation on the corrosion rate of reinforcing steel in concrete, *Cement and Concrete Research*, **26**(5) (1996) 761 - 769. <br> 5. Balabanić, G., Bićanić, N., Đureković, A.: Mathematical modeling of electrochemical steel corrosion in concrete, *Journal of Engineering Mechanics*, **122**(12) (1996) 1113 - 1122. |
|---|---|

| Leader of the following research projects | |
|---|---|

| Participant in the following research projects | 1. Ispitivanje poboljšanja svojstava betona i mortova <br> 2. Trajnost betona u kemijski agresivnim sredinama <br> 3. Matematički model projektiranja smjese betona bez aditiva <br> 4. Matematički model za naknadno utvrđivanje čvrstoće betona u konstrukciji <br> 5. Mehanika sloma lakoagregatnog betona <br> 6. Modeliranje utjecaja zagađenja i razvoj ekspertnog sistema riječkog zaljeva <br> 7. Optimalizacija projektiranja svojstava specijalnih betona <br> 8. Investigation of Damage Evolution in Continuum Modelling of Quasibrittle Materials <br> 9. Modeliranje nastajanja i širenja oštećenja u inženjerskim materijalima <br> 10. Numeričko modeliranje kvazi-krtih materijala <br> 11. Gojko Balabanić: Flexible long structures: non-linear modelling with visulaization (scientific project MZOS No. 114-0982562-1460; project leader Ivica Kožar) <br> 12. Gojko Balabanić: Numerical 3D chemo-hygro-thermo-mechanical model of concrete (scientific project MZOS No. 114-0000000-3145; project leader Joško Ožbolt) |
|---|---|

| Supervision of MSc theses | |
|---|---|

| Supervision of PhD theses | |
|---|---|

| Examination of MSc theses | 3 |
|---|---|

| Examination of PhD theses | 2 |
|---|---|

| Name of teacher: | Čedomir Benac |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Departmet of Civil Engineering<br>1.03.1990. |
|---|---|

| Title:<br>Since:<br>In: | Full Professor<br>20.02.2004 |
|---|---|

| e-mail address, web page | benac@gradri.hr |
|---|---|

| Knowledge of foreign languages: | English, Italian |
|---|---|

| Qualifications | - **date of birth, nationality:** 09.06.1950. Bakarac, Republic of Croatia<br>- **First degree obtained at:** University of Zagreb, Department of mining, oil exploitation and geology, 1974<br>- **Master degre obtained at:** University of Zagreb, Centre for postgraduate studies, 1981<br>- **Ph.D. degree obtained at:** University of Zagreb, Department of mining, oil exploitation and geology, 1995<br>- **additional education:**<br>- **previous employments:** 1974-1975 Industrija građevinskog materijala Tounj<br>1975-1979 Port of Rijeka<br>1979-1990 Rijekaprojekt Rijeka<br>1990-2001 Institute of Civil Engineering Rijeka<br>2001- University of Rijeka, Departmet of Civil Engineering |
|---|---|

| List of papers published in scientific journals | BENAC, Č. & ŠEGOTA, T. (1990): Potopljena ris-virmska abrazijska terasa u podmorju ispred Rijeke. - Geološki vjesnik, 43, 43-52, Zagreb.<br>BENAC, Č. & ARBANAS, Ž. (1990): Sedimentacija u području ušća Rječine. -Pomorski zbornik, 28, 593-609, Rijeka.<br>BENAC, Č., ARBANAS, Ž. & PAVLOVEC, E. (1991): Postanak i geotehničke osobitosti doline i zaljeva Raše. -Pomorski zbornik, 29, 475-492, Rijeka.<br>MAGDALENIĆ, A., JURAK, V. & BENAC, Č. (1992): Inženjerskogeološka problematika izgradnje luke u jugoistočnom dijelu Bakarskog zaljeva. -Pomorski zbornik, 30, 633-654, Rijeka.<br>PAVLOVEC, E., ARBANAS, Ž., BENAC, Č. & GALIĆ, D. (1992): Sedimentacijske i deformacijske značajke platoa južno od Starog grada u Rijeci. -Pomorski zbornik, 30, 655-677, Rijeka.<br>BENAC, Č. (1992): Recentni geomorfološki procesi i oblici u području Riječkog zaljeva. -Geografski glasnik, 54, 1-18, Zagreb.<br>ARBANAS, Ž., BENAC, Č. & JARDAS, B. (1994): Geotehničke značajke priobalnog područja grada Rijeke. - Pomorski zbornik 32, 467-480, Rijeka.<br>BENAC, Č. & HREŠIĆ, D. (1995): Geotehničko istraživanje jadranskog podmorja. -Pomorski zbornik, 33, 283-303, Rijeka.<br>BENAC, Č. (1996): Rast morske razine i promjene na obalama Kvarnera. -Pomorski zbornik, 34, 345-359, Rijeka.<br>BENAC, Č. (1996): Morfološka evolucija Riječkog zaljeva: utjecaj klimatskih i glacioeustatičkih promjena. - Acta Geographica Croatica, 31, 69-84, Zagreb.<br>**BENAC, Č. & DURN, G. (1997): Terra rosa in the Kvarner area - geomorphological conditions of formation. -Acta Geographica Croatica 32, 7-19, Zagreb.**<br>PAVLOVEC, E., BENAC, Č. & ARBANAS, Ž. (1998): Slijeganje priobalnog područja grada Rijeke. - Građevinar 50, 203-208, Zagreb.<br>JURAČIĆ, M., CRMARIĆ, R. & BENAC, Č. (1998): Holocenski sedimenti i sedimentacija u Riječkom zaljevu. -Prirodoslovna istraživanja riječkog područja (M.Arko-Pijevac, M.Kovačić & D.Crnković, eds.). Prirodoslovna biblioteka 1, 333-338. Prirodoslovni muzej Rijeka.<br>BENAC, Č. & JURAČIĆ, M. (1998): Geomorphological indicators of the sea level changes during Upper Pleistocene (Wuerm) and Holocene in the Kvarner region. Acta Geographica Croatica 33, 27-45.<br>BENAC, Č., ARBANAS, Ž., JARDAS, B., KASAPOVIĆ, S. & JURAK, V. (1999): Složeno klizište u dolini Rječine. -Rudarsko-geološko-naftni zbornik 11, 81-90.<br>JURAČIĆ, M., BENAC, Č., CRMARIĆ, R. (1999): Seabeded and surface sediments map of the Kvarer Bay, Adriatic Sea, Croatia. -Geologica Croatica 52, 131-140, Zagreb. |
|---|---|

| | |
|---|---|
| | ARKO-PIJEVAC, M., BENAC, Č., KOVAČIĆ, M. & KIRINČIĆ, M. (2001): A submarine cave at the Island of Krk (North Adriatic Sea). -Natura Croatica 10(3), 163-184, Zagreb.<br><br>BENAC, Č., RUBINIĆ, J. & OŽANIĆ, N. (2003): The Origine and Evolution of coastal and submarine springs in Bakar Bay. Acta Carsologica, 32/1, 157-171, Ljubljana.<br><br>BENAC, Č., RUBINIĆ, J., KARLEUŠA, B., JARDAS, B. & OŠTRIĆ, M. (2003): Changes of hydrogeological condition provoked by construction in the coastal zone of Rijeka. - RMZ - Materials and Geoenvironment (Groundwater in Geological Engineering), 50 (1), 21-24, Ljubljana.<br><br>BENAC, Č., JURAČIĆ, M. & BAKRAN-PETRICIOLI, T. (2004): Submerged tidal notches in the Rijeka Bay NE Adriatic Sea: Indicators of relative sea-level change and of recent tectonic movements. –Marine Geology 212, 21-33.<br><br>BENAC, Č., JURAK, V. OŠTRIĆ, M. (2005): Qualitative assessment of geohazard in Rječina Valley, Croatia. Geophysical Research Abstract, Vol. 7, 08943, 1-6, 2005. |
| **List of publications which serve as a proof of teaching qualifications** | Autocesta Rijeka-Trst: dionica Diračje-Matulji. Rijekaprojekt, 1989. (koordinator geotehničkih istraživanja i autor inženjerskogeološkog dijela elaborata)<br><br>Jadranska autocesta: dionica Orehovica-Draga-Sv.Kuzam.Geotehnički elaborat za glavni projekt objekata. IGH PC Rijeka, 1991. (koordinator geotehničkih istraživanja i autor inženjerskogeološkog dijela elaborata)<br><br>Jadranska autocesta: dionica Sv.Kuzam-Križišće. Geotehnički elaborat za idejni projekt objekata. IGH PC Rijeka, 1992. (koordinator geotehničkih istraživanja)<br><br>Magistralna cesta GMC-105 u Rijeci: dionica B-F. Geotehnički izvještaj za glavni projekt. IGH PC Rijeka, 1995. (koordinator geotehničkih istraživanja i autor inženjerskogeološkog dijela elaborata)<br><br>Prostorni plan Županije primorsko-goranske. Prirodna osnova: Geološke i inženjerskogeološke osobitosti. IGH PC Rijeka, 1996. (koordinator i koautor studije)<br><br>Prostorni plan Županije primorsko-goranske. Prirodna osnova: Stanje i namjena mora. IGH PC Rijeka, 1996. (koautor studije)<br><br>World Trade Center Rijeka. Geotehnički izvještaj za glavni projekt. IGH PC Rijeka, 1997. (koautor geotehničkog izvještaja)<br><br>Sanacija klizišta uz korito Rječine (I faza istraživačkih radova). IGH PC Rijeka, 1998. (koordinator geotehničkih istraživanja i koautor geotehničkog izvještaja)<br><br>Kanalizacijski sustav Split/Solin, I etapa. IGH PC Rijeka-Split, 1999. (koordinator geotehničkih istraživanja)<br><br>Sanacija klizišta uz korito Rječine (II faza istraživačkih radova). IGH PC Rijeka, 1999. (koordinator geotehničkih istraživanja i koautor geotehničkog elaborata)<br><br>Prostorni plan Primorsko-goranske županije. Osnove razvoja i zaštite, knjige 1, 2, 3. Zavod za razvoj, prostorno planiranje i zaštitu čovjekovog okoliša u Rijeci, Rijeka, 1998, 1999, 2000. (koautor i koordinator obrade prirodnih sustava i zaštite okoliša)<br><br>**Prostorni plan područja posebnih obilježja Vinodolske doline. Županijski zavod za održivi razvoj u Rijeci. Rijeka, 2002. (koautor)**<br><br>Klizište Sopatje na županijskoj cesti ŽC 5031, dionica Čabar-Zamost. Geotehnički istražni radovi-II faza istraživanja. IGH PC Rijeka, 2003. (koautor) |
| **Leader of the following research projects** | 1. Stanje prirodnih žala u Primorsko-goranskoj županiji, 1. faza (žali na obali između uvale Žurkovo i naselja Klenovica. općina Kostrena, gradovi Bakar, Kraljevica, Crikvenica i Novi Vinodolski) Projekt P-10 Primorsko-goranska županija.<br>2. Čedomir Benac: Assessment, reduction and management of geologic hazard in the Kvarner region (scientific project MZOS No. 114-0822695-2568) |
| **Participant in the following research projects** | 1984.-1986. "Istraživanje fliša Kvarnera u cilju racionalnijeg i ekonomičnijeg građenja" (Komitet za znanost RH)<br>1987. -1990. "Kompleksno inženjerskogeološko istraživanje ravničarskih i krških terena" (Komitet za znanost RH)<br>1990. -1995. "Hidrodinamička stabilnost obalne crte Jadranskog mora" (Ministarstvo ZT RH)<br>1990 -1995. "Fizičkogeološki procesi u priobalju i podmorju Jadrana". (Ministarstvo ZT RH)<br>1998. -2002. "Sedimenti Jadrana. Znanstvene osnove geološkog kartiranja" (Ministarstvo ZT RH)<br>od 2002. "Sedimenti jadranskog podmorja i priobalja" (Ministarstvo ZOŠ RH)<br>od 2002."Znanstvene osnove za razvoj natapanja u Republici Hrvatskoj" (Ministarstvo ZOŠ RH)<br>0d 2007. Čedomir Benac: Erosion and landslides as a unique geohazardous event (scientific project MZOS No. 195-0000000-2233; project leader Vladimir Jurak, Faculty of mining and geology of the University of |

| | Zagreb) |
|---|---|

| **Supervision of MSc theses** | - |
|---|---|

| **Supervision of PhD theses** | - |
|---|---|

| **Examination of MSc theses** | - |
|---|---|

| **Examination of PhD theses** | - |
|---|---|

| Name of teacher: | Adriana Bjelanović |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br>08.10.2003. |
|---|---|

| Title:<br>Since:<br>In: | Assistant Professor<br>07.10.2003.<br>Structural Engineering |
|---|---|

| e-mail address, web page | adriana.bjelanović@gradri.hr   http://www.gradri.hr/~adriana/ |
|---|---|
| Knowledge of foreign languages: | English |

| Qualifications | - **date of birth, nationality:** 14.10.1962, Šibenik, Croatia, Republic of Croatia<br>- **First degree obtained at:** University of Zagreb, Department of Civil Engineering<br>- **Master degre obtained at:** University of Zagreb, Department of Civil Engineering<br>- **Ph.D. degree obtained at:** University of Zagreb, Department of Civil Engineering<br>- **additional education:**<br>- **previous employments:** University of Zagreb, Department of Civil Engineering |
|---|---|

| List of papers published in scientific journals | 1. V. Rajčić, A. Bjelanović, M. Rak: "Nosivost ulijepljenih navijenih čeličnih šipki u elementima od hrastovine" Građevinar 56 (2004) 3, Ožujak, 2004, Zagreb, str. 155-161. |
|---|---|

| List of publications which serve as a proof of teaching qualifications | 2. A.Bjelanović, V.Rajčić; "Timber Structural Design based on NN Application and FE 3D parametric Modelling", 7th IC on the Application of AI to Civil and Structural Engineering, September 02-04.,2003, Egmond aan Zee, The Netherlands, Proceedings, 159-163.<br>3. V.Rajčić, A.Bjelanović; FEA Model of the Edge Crack under Tensile Stresses", 2nd IC of the ESWM, May, 25-28,2003, Stockholm, Sweden, Proceedings, 355-360.<br>4. A.Bjelanović, V.Rajčić; "AI Environment for Classification and Design of Structural Timber Elements", IC on Innovation in AEC, 18-20, July, 2001, Burleight Court ICC, Loughborough Univ., UK, Proceedings, 193-204<br>5. A.Bjelanović; "Stabilnost glavnog nosača - Modeliranje problema u ES-u" IV simpozij "Modeliranje u znanosti, tehnici i društvu", CROSS, HATZ, TF Sveučilišta u Rijeci, Lipanj, 2000, Zbornik radova, 309-317<br>6. V.Rajčić, A.Bjelanović; M. Rak: "Experimental Test of Glued Bolt Joint using Threaded Steel Bars", 8th WCTE, June, 14-17,2004, Lahti, Finland, Proceedings, 317-320.<br>7. V. Rajčić, A. Bjelanović, M. Rak: "Nosivost ulijepljenih navijenih čeličnih šipki u elementima od hrastovine" Građevinar 56 (2004) 3, Ožujak, 2004, Zagreb, str. 155-161. |
|---|---|

| Leader of the following research projects | |
|---|---|

| Participant in the following research projects | 1. "Ekspertni sustavi u dizajnu drvenih konstrukcija", University of Zagreb, Department of Civil Engineering (MZT RH) research project (1-02-024) project leader Z.Žagar, 06/1992.-05/2000.<br>2. "Studije sigurnosti i nosivosti drvenih konstrukcija", University of Zagreb, Department of Civil Engineering (MZT RH) research project (082017) project leader Z.Žagar, 02/2001.-07/2001.<br>3. "Analize sigurnosti i unapređenje drvenih konstrukcija", University of Zagreb, Department of Civil Engineering (MZT RH) research project (0082202) project leader M.Haiman, 08/2001.-12/2003.<br>4. Adriana Bjelanović: Composite systems timber-glass and timber-steel (scientific project MZOS No. 082-1491823-1463; project leader Vlatka Rajčić, Faculty of Civil Engineering of the University of Zagreb) |
|---|---|

| **Supervision of MSc theses** | - |
|---|---|

| **Supervision of PhD theses** | - |
|---|---|

| **Examination of MSc theses** | - |
|---|---|

| **Examination of PhD theses** | - |
|---|---|

| Name of teacher: | Ognjen Bonacci |
|---|---|

| Employed at:<br>Since: | University of Split, Department of Civil Engineering and Architecture<br>1. 11. 1976. |
|---|---|

| Title:<br>Since:<br>In: | Full professor<br>25. I. 1996.<br>Hydraulics |
|---|---|

| e-mail address, web page | obonacci@gradst.hr |
|---|---|

| Knowledge of foreign languages: | English, Russian, French |
|---|---|

| Qualifications | **- date of birth, nationality:** 24. VII. 1942., Republic of Croatia<br>**- First degree obtained at:** University of Zagreb, Department of Civil Engineering<br>**- Master degre obtained at:** University of Zagreb, Department of Mechanical Engineering and Naval Architecture<br>**- Ph.D. degree obtained at:** University of Zagreb, Department of Civil Engineering<br>**- additional education:**<br>**- previous employments:** 1965.-1969. Sava Utility, Zagrebu; 1970.-1976. Institute for hydrometeorology, Zagreb |
|---|---|

| List of papers published in scientific journals | 1. Bonacci, Ognjen.<br>**Hazards caused by natural and anthropogenic changes of catchment area in karst**. // *Natural Hazards and Earth System Sciences*. **4** (2004) , 5; 655-661<br>2. Bonacci, Ognjen; Roje-Bonacci, Tanja.<br>**The influence of hydroelectrical development on the flow regime of the karstic river Cetina**. // *Hydrological Processes*. **17** (2003) , 1; 1-15<br>3. Bonacci, Ognjen.<br>**Analysis of the maximum discharge of karst springs**. // *Hydrogeology Journal*. **9** (2001) , 4; 328-338<br>4. Bonacci, Ognjen.<br>**Monthly and annual effective infiltration coefficients in Dinaric karst : example of the Gradole karst spring catchment**. // *Hydrological Sciences  Journal*. **46** (2001) , 2; 287-299<br>5. Bonacci, Ognjen; Roje-Bonacci, Tanja.<br>**Interpretation of groundwater level monitoring results in karst aquifers: examples from the Dinaric karst** . // *Hydrological Processes*. **Volume 14** ( 2000. ) , 14; 2423-2438<br>6. Bonacci, Ognjen.<br>**Water circulation in Karst and Determination of catchment areas: Example of the Zrmanja River**. // *Hydrological Sciences Journal*. **44** (1999) , 3; 373-386<br>7. Bonacci, Ognjen; Matešan, Domagoj.<br>**Analysis of precipitation appearance in time**. // *Hydrological Processes*. **13** (1999) , 6; 1683-1690<br>8. Bonacci, Ognjen; Kerovec, Mladen; Mrakovčić, Milorad; Roje-Bonacci, Tanja; Plenković Moraj, Anđelka.<br>**Ecologically acceptable flows definition for the Žrnovnica river (Croatia)**. // *Regulated Rivers : Research and Management*. **14** (1998) , 3; 245-256<br>9. Bonacci, Ognjen; Roje-Bonacci, Tanja.<br>**Sea water intrusion in coastal karst springs: example of the Blaz Spring (Croatia)**. // *Hydrological Sciences Journal*. **42** (1997) , 1; 89-100<br>10. Bonacci, Ognjen.<br>**Ground water behaviour in karst: example of the Ombla Spring (Croatia)**. // *Journal of Hydrology*. **165** (1995) , 165; 113-134<br>11. Bonacci, Ognjen; Fritz, Franjo; Denić, Vesna .<br>**Hydrogeology of Slanac Spring**. // *Hydrogeology Journal*. **3** (1995) , 3; 31-40<br>12. Bonacci, Ognjen.<br>**Karst springs hydrographs as indicators of karst aquifers**. // *Hydrological Sciences Journal*. **38** (1993) , 1, 2; 51-62<br>13. Bonacci, Ognjen.<br>**The Vrana lake hydrology (Island of Cres - Croatia)**. // *Water Resources Bulletin American Water Resources Association*. **29** (1993) , 3; 407-414 |
|---|---|

| | 14. Bonacci, Ognjen. |
|---|---|
| | **Hydrological identification of drought**. // *Hydrological Processes*. **7** (1993) , 7; 249-262 |
| | 15. Bonacci, Ognjen; Magdalenić, Antun. |
| | **The catchment area of the Sv. Ivan karst spring in Istria (Croatia)**. // *Ground Water*. **31** (1993) , 5; 767-773 |
| | 16. Bonacci, Ognjen; Živaljević, Ratomir. |
| | **Hydrological explanation of the flow in karst: example of the Crnojevića spring**. // *Journal of Hydrology*. **146** (1993) , 1; 405-419 |

| List of publications which serve as a proof of teaching qualifications | Bonacci, O. Ekohidrologija vodnih resursa i otvorenih vodtoka. Građevinsko-arhitektonski fakultet Split, 2003. <br> Bonacci, O., Kerovec, M., Mrakovčić, M., Roje-Bonacci, T., Plenković Moraj, A. <br> **Ecologically acceptable flows definition for the Žrnovnica river (Croatia)**. *Regulated Rivers : Research and Management*. **14** (1998) , 3; 245-256 |
|---|---|

| Leader of the following research projects | 1. Analiza hidroloških i ekoloških karakteristika suša i poplava u kršu <br> 2. Hidroekološka istraživanja sustava krških ponornica i vodonosnika u kršu (Joint Croatian-Slovenian project) <br> 3. Ognjen Bonacci: Investigation of extreme hydrological situations and water risks in karst (scientific project MZOS No. 083-0831510-1511) |
|---|---|

| Participant in the following research projects | 1. Modelling of erosion, transport and sedimentation processes in the Danube River and its major tributaries <br> 2. Inventory of the main hydraulic structures in the Danube basin <br> 3. Ognjen Bonacci:  Water balance and drainage models in karst (scientific project MZOS No. 083-0831510-1513; project leader Vesna Denić-Jukić, Faculty of Civil Engineering and Architecture of the University of Split) |
|---|---|

| Supervision of MSc theses | 18 |
|---|---|

| Supervision of PhD theses | 7 |
|---|---|

| Examination of MSc theses | 28 |
|---|---|

| Examination of PhD theses | 17 |
|---|---|

| Name of teacher: | Boštjan Brank |
|---|---|

| Employed at: Since: | University of Ljubljana, Department of Civil Engineering and Geodesy 1.10.1999 |
|---|---|

| Title: Since: In: | Assistant Professor 5.7.2004 Engineering Mechanics |
|---|---|

| e-mail address, web page | bbrank@ikpir.fgg.uni-lj.si |
|---|---|

| Knowledge of foreign languages: | English |
|---|---|

| Qualifications | **- date of birth, nationality:** 1963, Republic of Slovenia<br>**- First degree obtained at:** 1987, University of Ljubljana, Department of Civil Engineering and Geodesy<br>**- Master degre obtained at:** 1991, University of of Ljubljana, Department of Civil Engineering and Geodesy<br>**- Ph.D. degree obtained at:** 1994, University of Ljubljana, Department of Civil Engineering and Geodesy<br>**- additional education:** 1992, 1993, University of Wales Swansea<br>1995, 1996, Universita degli studi di Padova<br>1998, Politecnico di Torino<br>**- previous employments:** 1987-88, Engineering bureau Elektroprojekt<br>1996-2000, Institute for Civil Engineering of Slovenia |
|---|---|

| List of papers published in scientific journals | 1. BRANK, Boštjan, PERIĆ, Djordje, DAMJANIĆ, Frano. On implementation of a nonlinear four node shell finite element for thin multilayered elastic shells. *Comput. mech.*, 1995, vol. 16, no 5, str. 341-359.<br>2. BRANK, Boštjan, PERIĆ, Djordje, DAMJANIĆ, Frano. On large deformations of thin elasto-plastic shells: implementation of a finite rotation model for quadrilateral shell element. *Int. j. numer. methods eng.*, 1997, vol. 40, str. 689-726.<br>3. BRANK, Boštjan, BRISEGHELLA, Lamberto, TONELLO, Nicola, DAMJANIĆ, Frano. On non-linear dynamics of shells : implementation of energy-momentum conserving algorithm for a finite rotation shell model. *Int. j. numer. methods eng.*, 1998, vol. 42, str. 409-442.<br>4. SHIFRIN, Efim I., BRANK, Boštjan, SURACE, Giuseppe. Analytical-numerical solution of elliptical interface crack problem. *Int. j. fract.*, 1998, vol. 94, no 1-4, str. 201-215.<br>5. BRANK, Boštjan, CARRERA, Erasmo. A family of shear-deformable shell finite elements for composite structures. *Comput. struct.*. [Print ed.], 2000, vol. 76, str. 287-297.<br>6. BRANK, Boštjan, CARRERA, Erasmo. Multilayered shell finite element with interlaminar continuous shear stresses : a refinement of the Reissner-Mindlin formulation. *Int. j. numer. methods eng.*, 2000, vol. 48, n. 6, str. 843-874.<br>7. SHIFRIN, Efim I., BRANK, Boštjan. On solution of elliptical interface crack problem. Fields Institute Communication Series, 2000, vol. 25, str. 485-496.<br>8. BRANK, Boštjan, IBRAHIMBEGOVIĆ, Adnan. On the relation between different parametrizations of finite rotations for shells. *Eng. comput.*, 2001, vol. 18, n. 7, str. 950-973.<br>9. IBRAHIMBEGOVIĆ, Adnan, BRANK, Boštjan, COURTOIS, Pierre. Stress resultant geometrically exact form of classical shell model and vector-like parameterization of constrained finite rotations. *Int. j. numer. methods eng.*, 2001, vol. 52, issue 11, str. 1235-1252.<br>10. BRANK, Boštjan. On composite shell models with a piecewise linear warping function. *Compos. struct.*. [Print ed.], 2002, vol. 59, str. 163-171.<br>11. BRANK, Boštjan. An energy conserving non-linear dynamic finite element formulation for flexible composite laminates. *Comput. struct.*. [Print ed.], 2002, vol. 80, n. 7/8, str. 677-689.]<br>12. BRANK, Boštjan, KORELC, Jože, IBRAHIMBEGOVIĆ, Adnan. Nonlinear shell problem formulation accounting for through-the-tickness stretching and its finite element implementation. *Comput. struct.*. [Print ed.], 2002, vol. 80, n. 9/10, str. 699-717.<br>13. BRANK, Boštjan, KORELC, Jože, IBRAHIMBEGOVIĆ, Adnan. Dynamic and time-stepping schemes for elastic shells undergoing finite rotations. *Comput. struct.*. [Print ed.], 2003, vol. 81, issue 12, str. 1193-1210.<br>14. REBEC, Andrej, PLEŠEC, Primož, BRANK, Boštjan. Simulation of the behaviour of the aluminium structures subjected to high temperatures. *Gradb. vestn.*, 2003, letn. 52, št. 6, str. 126-136. |
|---|---|

| | 15. BRANK, Boštjan. Nonlinear shell models with seven kinematic parameters. *Comput. methods appl. mech. eng..* [Print ed.], 2005, letn. 194, str. 2336-2362. |
|---|---|

| **List of publications which serve as a proof of teaching qualifications** | |
|---|---|

| **Leader of the following research projects** | 1. J2-0646, Optimization of laminated composite structures, Slovenian Ministry of Science and Technology, 1.7.1998-30.6.2001 |
|---|---|
| | 2. Proteus 98011, Razvoj računalniškega modela lupin za industrijske aplikacije / Modélisation numérique des coques et développement des modeles raffinés pour les problemes industriels, Slovenian-France bilateral research project, 1988-2000 |

| **Participant in the following research projects** | 1. L2-1185, Durability of high-strength and convenctional concrete, Slovenian Ministry of Science and Technology , 1.1.1999-30.6.2000 |
|---|---|
| | 2. L2-1657, Analiza mehanosorptivnega lezenja lesenih lepljenih lameliranih elementov, Ministrstvo za znanost in tehnologijo Republike Slovenije, 1.1.1999-30.6.2001 |
| | 3. P0-0506-0792, Structures and Construction Information Technology, Slovenian Ministry of Science and Technology, 1.1.1999-31.12.2003 |
| | 4. P2-0210, E-Construction, Slovenian Ministry of Education, Science and Sport, 1.1.2004-31.12.2008 |

| **Supervision of MSc theses** | 0 |
|---|---|

| **Supervision of PhD theses** | 2 |
|---|---|

| **Examination of MSc theses** | 2 |
|---|---|

| **Examination of PhD theses** | 2 |
|---|---|

| Name of teacher: | Mehmed Čaušević |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br>01.04.1993 |
|---|---|

| Title:<br>Since:<br>In: | Full Professor<br>05. 05. 1998<br>Engineering Mechanics |
|---|---|

| e-mail address, web page | mehmed.causevic@gradri.hr ; www.gradri.hr |
|---|---|

| Knowledge of foreign languages: | English, German |
|---|---|

| Qualifications | - **date of birth, nationality:** 10. 08. 1945, Republic of Croatia<br>- **First degree obtained at:** University of Belgrade, Department of Civil Engineering, 1969<br>- **Master degre obtained at:** University of Belgrade, Department of Civil Engineering, 1973<br>- **Ph.D. degree obtained at:** University of Ljubljana, Department of Civil Engineering and Geodesy, 1978<br>- **additional education:** post-doctoral research, University of California, Berkeley, 1982., „Earthquake Engineering"<br>- **previous employments:** University of Split, Department of Civil Engineering, Civil Engineering Institute Banjaluka, Energoprojekt Beograd, |
|---|---|

| List of papers published in scientific journals | 1. Čaušević, M., Fajfar, P., Fischinger, M., Isaković, T., *Proračun vijadukta na djelovanje sila potresa prema Eurokodu 8/2*, GRAĐEVINAR **55** (2003) 3, 143-153.<br>2. Čaušević, M., Repac, D., *Proračun čelične konstrukcije prema europskim prednormama ENV*, časopis Građevinar **54** (2002)2, Zagreb, 79-86.<br>3. Čaušević, M., *State-of-the-art on aerodynamics of steel long-span bridges at the end of the second millennium*, INFORMATOLOGIA, 34, 2001, 3-4, Zagreb, pp. 252-258. |
|---|---|

| List of publications which serve as a proof of teaching qualifications | 1. Čaušević, M., Bulić, M., *Seismic Retrofitting of Short-to-Medium-Span Hyghway Concrete Bridges*, Proceedings of the International Symposium organized by Croatian Society of Structural Engineers (CSSE) and Austrian Society for Concrete and Construction Technology (ASCCT), Dubrovnik, 2004. pp. 651-659.<br>2. Čaušević, M., Bulić, M., *Čelične građevinske konstrukcije u potresnim područjima prema konačnoj verziji Eurokoda 8*, Zbornik radova savjetovanja HRVATSKA NORMIZACIJA I SRODNE DJELATNOSTI, Brijuni, 2004, str. 403-410.<br>3. Čaušević, M., *Upoređenje seizmičkih opterećenja dobivenih prema eurokodu 8, američkoj normi UBC i hrvatskom pravilniku*, Zborni radova savjetovanja HRVATSKA NORMIZACIJA I SRODNE DJELATNOSTI, Cavtat 2003, str. 539-549<br>4. Wasik, K., Čaušević, M., *Structural design using new release of Robot Millennium structural software package*, Zbornik radova Petog općeg sabora Hrvatskog društva građevinskih konstruktora, Urednik J. Radić, Brijuni, 2001., pp. 593-600.<br>5. Čaušević, M., *Kombinacija opterećenja prema Eurokodu 1 i PBAB za proračun konstrukcija prema graničnom stanju nosivosti*, Zbornik radova Sabora hrvatskih graditelja, Cavtat, 2000. str. 365-373.<br>6. Čaušević, M., *Statika i Stabilnost konstrukcija – Geometrijska nelinearnost,* Sveučilišni udžbenik, Školska knjiga, Zagreb, 2003., str. 240.<br>7. Čaušević, M., *Potresno inženjerstvo*, Sveučilišni udžbenik, Školska knjiga, Zagreb, 2001.,str. 252.<br>8. Čaušević, M., *Tehnička mehanika - Kinematika,* Sveučilišni udžbenik, Školska knjiga, Zagreb, 2000., str. 210. |
|---|---|

| Leader of the following research projects | 1. Građevinske konstrukcije u seizmičkim područjima Hrvatske, Znanstveni projekt pri MZOS od 2000.-2005, 0114006<br>2. Mehmed Čaušević: Development of structures with higher reliability in earthquakes (scientific project MZOS No. 114-0821466-1470) |
|---|---|

| Participant in the following | Mehmed Čaušević: Reliability of structures made from new materials (scientific project MZOS No. 082-0821466-1468; project leader Boris Androić, Faculty of Civil Engineering of the University of Zagreb) |
|---|---|

| **research projects** | |
|---|---|

| **Supervision of MSc theses** | 2 |
|---|---|

| **Supervision of PhD theses** | - |
|---|---|

| **Examination of MSc theses** | 2 |
|---|---|

| **Examination of PhD theses** | - |
|---|---|

| Name of teacher: | JULIJAN DOBRINIĆ |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Faculty of Engineering<br>1972 |
|---|---|

| Title:<br>Since:<br>In: | Full professor<br>17.11.2000.<br>Fundamental technical sciences |
|---|---|

| e-mail address, web page | julijan.dobrinic@riteh.hr |
|---|---|
| Knowledge of foreign languages: | English, German |

| Qualifications | - date of birth, nationality:     7.11.1945, Republic of Croatia<br>- First degree obtained at:<br>- Master degre obtained at:     Centre for Postgraduate Studies (1977)<br>- Ph.D. degree obtained at:     Institute Ruđer Bošković (1989)<br>- additional education:<br>- previous employments:     Engineering high school Rijeka (1968-1969)<br>    Maritime high school Bakar (1969-1971) |
|---|---|

| List of papers published in scientific journals | 1. J. Dobrinić, M. Kunić, Z. Ciganj: Primjena spektroskopijskih metoda kod analize opasnog otpada, Goriva i maziva, 39, 1 : 25-34, 2000.<br>2. J. Dobrinić, N. Fafandjel, S. Car Haidinger: Tanker Effluents Pollution Degree Monitoring Equipment, Zbornik radova XIV. Simpozija Teorija i praksa brodogradnje SORTA 2000, Rijeka (2000.) 305.-312.<br>3. J. Dobrinić, B. Čalić, N. Fafandjel: Pollution Analysis in Ocean Engineering, Proceedings of the Fifth International Symposium and Exhibition on Environmental Contamination in Central and Eastern Europe, Prague (2000) CD ROM.<br>4. J. Dobrinić, N. Fafandjel: The Role of Scientific and Engineering Aspects of Sea Protection in Development of Shipbuilding and Marine Technology, Međunarodni kongres Energija i okoliš 2000, Opatija (2000) 327.-332.<br>5. N. Fafandjel, J. Dobrinić, S. Car Haidinger: Some methods for monitoring of ships effluents pollution degree, Proceedings of the II. International Conference Safe Navigation Beyond 2000, Gdynia (2000) 49-56<br>6. N. Fafandjel, J. Dobrinić, M. Hadjina: Criteria for Evaluating Work Content and Production Costs of Ship Design Alternatives, Proceedings of the 11th International DAAAM Symposium, Opatija (2000) 139-140<br>7. J. Dobrinić, N. Fafandjel: Ship Equipment Proposal for Metal Elements Control, Proceedings of the 11th International DAAAM Symposium, Opatija (2000) 123-124.<br>8. J. Dobrinić: Onečišćenje mora uljima i elementima u tragovima, Pomorski zbornik, Rijeka (2000) 333.-348.<br>9. N. Fafandjel, J. Dobrinić, M. Hadjina: Production costs implementation concept for preliminary design evaluation, Proceeding of the IMAM (International Maritime Associatiation of the Mediterranean) 2002, Rethymno, Crete, Hellas, 2002, CD ROM<br>10. J. Dobrinić, N. Fafandjel: Possible Consequences From Oil Transport Within Kvarner Bay - Some Solutions For Oil Monitoring And New Konstruction Of Ships, Proceedings of the Sixth International Symposium and Exhibition on Environmental Contamination in Central and Eastern Europe and the Commonwealth of Independent States, Prague (2003), CD ROM.<br>11. J. Dobrinić, A. Ljubičić, D. A. Bradley: Nuclear excitation in $^{111}$Cd by positron-electron annihilation process, Radiation Physics and Chemistry, 69 (2004) 189-192<br>12. J. Dobrinić, M. Kunić: Determination of heavy metals concentrations in marine oils and estimation of their influence on sea environment, Knjiga sažetaka skupa 11. Ružičkini dani, Vukovar, 2004, P-32 |
|---|---|

|  | 13. J. Dobrinić, N. Orlić, Z. Kaliman: Trace elements in environmental samples determined by X-ray spectroscopy, Radiation Physics and Chemistry 71 (2004) 801-802 |
|---|---|

| **List of publications which serve as a proof of teaching qualifications** | 1. J. Dobrinić, L. Mandić: Zbirka riješenih primjera iz Fizike I., Teh. fakultet Sveučilišta u Rijeci, Rijeka, 2001.<br>2. J. Bonato, J. Dobrinić: Zbirka odabranih riješenih primjera iz fizike, VPŠ u Rijeci, Rijeka, 2001.<br>3. J. Dobrinić, L. Mandić: Fizika 1, Tehnički fakultet, Rijeka, 2002.<br>4. N. Glavan, L. Mandić, J. Dobrinić: Zbirka riješenih primjera iz Fizike II., Tehnički fakultet Sveučilišta u Rijeci, Rijeka, 2004. |
|---|---|

| **Leader of the following research projects** | Project No: 07/ 0069,  Development of Mössbauer's spectroscopy - application in nuclear physics and engineering, Research agency of SR Croatia<br>Project No: 2 - 09 - 012, Interaction of maritime technology object with environment, Ministry of Science of Republic of Croatia (1991.-1996.)<br>Project No: 069018, Ecology of objects of maritime technology, Ministry of Science and Technology of Republic of Croatia (1997.-2000.)<br>Project No: 0069018, Influence of objects of maritime technology on environment, Ministry of Science and Technology of Republic of Croatia (2001.-2006.)<br>Julijan Dobrinić: Investigation of methods to suppress sea pollution from the marine technology (scientific  project MZOS No. 069-0691668-3007) |
|---|---|

| **Participant in the following research projects** | Project No 2-08-373 System of collection, treatment and neutralisation of waste fluids from ships and sea, (1992-94) |
|---|---|

| **Supervision of MSc theses** | - |
|---|---|

| **Supervision of PhD theses** | - |
|---|---|

| **Examination of MSc theses** | - |
|---|---|

| **Examination of PhD theses** | - |
|---|---|

| Name of teacher: | Svjetlan Feretić |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br>1. 10. 1999 |
|---|---|

| Title:<br>Since:<br>In: | Associate Professor<br>21. 12. 2004<br>Mathematics |
|---|---|

| e-mail address, web page | svjetlan.feretic@gradri.hr; www.gradri.hr |
|---|---|

| Knowledge of foreign languages: | English, Italian, Russian |
|---|---|

| Qualifications | - **date of birth, nationality:** 22. 6. 1961, Republic of Croatia<br>- **First degree obtained at:** University of Zagreb, Faculty of Mathematics and Natural Sciences<br>- **Master degre obtained at:** University of Zagreb, Faculty of Mathematics and Natural Sciences<br>- **Ph.D. degree obtained at:** University of Zagreb, Faculty of Mathematics and Natural Sciences<br>- **additional education:**<br>- **previous employments:** University of Rijeka |
|---|---|

| List of papers published in scientific journals | 1. S. Feretić, An alternative method for q-counting directed column-convex polyominoes, Discrete Math. 210 (2000), 55-70.<br>2. S. Feretić, A q-enumeration of directed diagonally convex polyominoes, Discrete Math. 246 (2002), 99-109.<br>3. E. Deutsch, S. Feretić i M. Noy, Diagonally convex directed polyominoes and even trees: a bijection and related issues, Discrete Math. 256 (2002), 645-654.<br>4. S. Feretić, A bijective perimeter enumeration of directed convex polyominoes, J. Statist. Plann. Inference 101 (2002), 81-94.<br>S. Feretić, A q-enumeration of convex polyominoes by the festoon approach, Theoret. Comput. Sci. 319 (2004), 333-356. |
|---|---|

| List of publications which serve as a proof of teaching qualifications | 1. D. Car-Pušić, S. Feretić i N. Turina, Planning of deadlines and costs in civil engineering projects, u: M. Radujković i<br> M. Katavić (ur.), knjiga sažetaka Druge SENET konferencije o project managementu, Cavtat, 2002, str. 20. |
|---|---|

| Leader of the following research projects | |
|---|---|

| Participant in the following research projects | Svjetlan Feretić: Discrete mathematics and applications (scientific  project MZOS No. 037-0000000-2779; project leader Dragutin Svrtan, Faculty of Natural Sciences and Mathematics of the University of Zagreb)<br>Svjetlan Feretić: Discrete mathematical models in chemistry (scientific  project MZOS No. 177-0000000-0884; project leader Damir Vukičević, Faculty of Natural Sciences, Mathematics and Kinesiology of the University of Split) |
|---|---|

| Supervision of MSc theses | 0 |
|---|---|

| Supervision of PhD theses | 0 |
|---|---|

| Examination of MSc theses | 0 |
|---|---|

| Examination of PhD theses | 0 |
| --- | --- |

| Name of teacher: | Suzana Ilić |
|---|---|

| **Employed at:** | Lancaster University, United Kingdom |
|---|---|
| **Since:** | 1/09/1999 |

| **Title:** | Assistant Professor |
|---|---|
| **Since:** | 1/09/1999 |
| **In:** | Hydraulic Engineering |

| **e-mail address, web page** | s.ilic@lancaster.ac.uk |
|---|---|
| **Knowledge of foreign languages:** | English, German, French, Italian |

| | |
|---|---|
| **Qualifications** | **- date of birth, nationality:** 08/02/1961, Republic of Croatia <br> **- First degree obtained at:** University of Rijeka, Department of Civil Engineering <br> **- Master degre obtained at:** Computational Hydraulics, International Institute for Hydraulic and Environmental Engineering, Delft, the Netherlands <br> **- Ph.D. degree obtained at:** Coastal Engineering, School of Civil and Structural Engineering, University of Plymouth, United Kingdom <br> **- additional education: 1991,** Postgraduate diploma in Hydraulic Engineering, International Institute for Hydraulic and Environmental Engineering, Delft, the Netherlands <br> **- previous employments:**. <br> 1996 - 1999 **University of Plymouth, School of Civil and Structural Engineering** Research Fellow for collaborative project between University of Plymouth, University of Liverpool and Halcrow - "A Study of Offshore Breakwaters Using the CRF and the Elmer Field Data". <br> 1993 - 1996 **University of Plymouth, School of Civil and Structural Engineering** Research Assistant for the project "The Role of Offshore Breakwaters in Coastal Defence". <br> 1993 **University of Brighton, Department of Civil Engineering** Research Officer for the project "The Role of Offshore Breakwaters in Coastal Defence". Moved to Plymouth with the project. <br> 1992 - 1993 **University of Rijeka, Department of Civil Engineering,** Teaching Assistant in Fluid Mechanics and Hydrology <br> 1991 - 1992 **Institute for Hydraulic and Environmental Engineering,** Delft, The Netherlands Assistant lecturer in Environmental Hydraulics and Environmental modelling classes (u zamjenu za skolarinu) <br> 1985 - 1990 **University of Rijeka, Department of Civil Engineering,** |

| | |
|---|---|
| **List of papers published in scientific journals** | **Journal Papers:** <br> Erduran, K., **Ilic**, S., Kutija, V. 2004, Hybrid Finite-Volume Finite-Difference Scheme for the Solution of Boussinesq Equations, International Journal Numerical Methods in Fluids *(in press)* <br> **Ilic**, S., Chadwick, A.J., Helm-Petersen, J., 2000, An Evaluation of Directional Analysis Techniques for Multidirectional, Partially Reflected Waves: Part 1 Numerical Investigations, *Journal of Hydraulic Research*, Vol 38, No 4, pp 243-253 <br> Chadwick, A.J., **Ilic**, S., Helm-Petersen, J., 2000, An Evaluation of Directional Analysis Techniques for Multidirectional, Partially Reflected Waves: Part 2 Application to Field Data, *Journal of Hydraulic Research*, Vol 38, No 4, pp 253-259 <br> Chadwick, A.J., Pope, D.J., Borges, J., **Ilic**, S., 1995, Shoreline Directional Wave Spectra. Part 1. An Investigation of Spectral and Directional Analysis Techniques, *Proc Instn Civ Engrs, Water Maritime and Energy*, Vol 112, Issue 3 <br> Chadwick, A.J., Pope, D.J., Borges, J., **Ilic**, S., 1995, Shoreline Directional Wave Spectra. Part 2. Instrumentation and Field Measurements, *Proc Instn Civ Engrs, Water Maritime and Energy*, Vol 112, Issue 3 |

| List of publications which serve as a proof of teaching qualifications | •   'Certificate in Learning and Teaching in Higher Education (CiLTHE) programme' Stage 1 and Stage 2 at Lancaster University.<br>Stage 1: Essay – It made me think what to do rather than just doing it (6132 words)<br>Stage 2: Portfolio ( 25767 words) containing<br>    P1.  Background and Context  (470 words)<br>    P2.  Mapping Document (503 words)<br>    P3.  Scheme of Work (9514 words)<br>    P4.  Research Report - 'Approaches to Learning and Learning Styles for a Geography student group taking Coastal Processes course' (11351 words)<br>    P5.  Synthesis (1333 words)<br>    P6.  Evaluative Report (2596 words)<br>•   'Workshop for New and Recently Appointed Teaching Staff: Designing and Delivering Courses/Modules in Geography, Earth and Environmental Sciences'. |
|---|---|

| Leader of the following research projects | 2005        Wyre Borough Council, Cleveleys Video Monitoring Project, ugovor na potpisu<br>2002        EPSRC, Beach Processes Network (CI)<br>2002-2003    EPSRC, Finite-Volumes Numerical Models for Prediction of Nearshore Currents (PI) |
|---|---|

| Participant in the following research projects | 1996 - 1999   **University of Plymouth, School of Civil and Structural Engineering**<br>Research Fellow for collaborative project between University of Plymouth, University of Liverpool and Halcrow - "A Study of Offshore Breakwaters Using the CRF and the Elmer Field Data".<br>1993 - 1996   **University of Plymouth, School of Civil and Structural Engineering**<br>Research Assistant for the project "The Role of Offshore Breakwaters in Coastal Defence". |
|---|---|

| **Supervision of MSc theses** | 3 |
|---|---|

| **Supervision of PhD theses** | 1 |
|---|---|

| **Examination of MSc theses** | 0 |
|---|---|

| **Examination of PhD theses** | 0 |
|---|---|

| Name of teacher: | Gordan Jelenić |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br>1 March 2004 |
|---|---|

| Title:<br>Since:<br>In: | Assistant Professor<br>10 April 2003<br>Engineering Mechanics |
|---|---|

| e-mail address, web page | gordan@gradri.hr |
|---|---|

| Knowledge of foreign languages: | English, Slovenian, Italian, Russian |
|---|---|

| Qualifications | - **date of birth, nationality:** 12 July 1962, Republic of Croatia<br>- **First degree obtained at:** University of Rijeka, Department of Civil Engineering<br>- **Master degre obtained at:** University of Ljubljana, Department of Civil Engineering and Geodesy<br>- **Ph.D. degree obtained at:** University of Ljubljana, Department of Civil Engineering and Geodesy<br>- **additional education:** Research associate (1993-1998), Research Fellow (1999-2003)<br>- **previous employments:** Građevno-projektni zavod Rijeka (1987-1990), University of Ljubljana, Department of Civil Engineering and Geodesy (1990-1993), Aeronautics Department, Imperial College London (1993-2003) |
|---|---|

| List of papers published in scientific journals | 1. Saje, M. and Jelenic, G., Finite element formulation of hyperelastic plane frames subjected to nonconservative loads, Comput. Struct. 50, 177-189 (1994)<br>2. Jelenic, G. and Saje, M., Finite deformations of linear elastic space beams, Z. Angew. Math. Mech. 74, T298-T300 (1994)<br>3. Jelenic, G. and Saje, M., A kinematically exact space finite strain beam model -- finite element formulation by generalized virtual work principle, Comp. Meth. Appl. Mech. Eng. 129, 131-161 (1995)<br>4. Crisfield, M.A., Moita, G.F., Jelenic, G. and Lyons, L.P.R., Enhanced lower-order element formulations for large strains, Computat. Mech. 17, 62-73 (1995)<br>5. Jelenic, G. and Crisfield, M.A., Non-linear 'master--slave' relationships for joints in 3-D beams with large rotations, Comp. Meth. Appl. Mech. Eng. 135, 211-228 (1996)<br>6. Crisfield, M.A., Jelenic, G., Mi, Y., Zhong, H-G. and Fan, Z., Some aspects of the non-linear finite element method, Finite Elem. Anal. Design 27, 19-40 (1997)<br>7. Crisfield, M.A., Galvanetto, U. and Jelenic, G., Dynamics of 3-D co-rotational beams, Computat. Mech. 20, 507-519 (1997)<br>8. Jelenic, G. and Crisfield, M.A., Interpolation of rotational variables in nonlinear dynamics of 3D beams, Int. J. Num. Meth. Eng. 43, 1193-1222 (1998)<br>9. Crisfield, M.A., Jeleni\c, G. and Galvanetto, U., Finite elements with nonlinear statics and dynamics, Solid Mechanics and its Applications 68, 91-98 (1999)<br>10. Crisfield, M.A. and Jelenic, G., Objectivity of strain measures in geometrically exact 3D beam theory and its finite element implementation, Proc. R. Soc. Lond. A 455, 1125-1147 (1999)<br>11. Jeleni\c, G. and Crisfield, M.A., Geometrically exact 3D beam theory: Implementation of a strain-invariant finite element for statics and dynamics, Comp. Meth. Appl. Mech. Eng. 171, 141-171 (1999)<br>12. Crisfield, M.A. and Jelenic, G., Finite element analysis and deployable structures, Solid Mechanics and its Applications 80, 87-96 (2000)<br>13. Jelenić, G. and Crisfield, M.A., Dynamic analysis of 3D beams with joints in presence of large rotations, Comp. Meth. Appl. Mech. Eng. 190, 4195-4230 (2001)<br>14. Crisfield, M.A. and Jelenić, G., Energy/momentum conserving time integration procedures with finite elements and large rotations, NATO Science Series Sub Series III Computer and Systems Sciences, 179, 121-140 (2001)<br>15. Graham, E., Jelenić, G. and Crisfield, M.A., A note on the equivalence of some recent time-integration schemes for N-body problems, Comm. Num. Meth. Eng. 18, 615-620 (2002)<br>16. Jelenić, G. and Crisfield, M.A., Problems associated with the use of Cayley transform and tangent scaling for conserving energy and momenta in the Reissner--Simo beam theory, Comm. Num. Meth. Eng. 18, 711-720 (2002)<br>17. Munoz, J.J., Jelenić, G. and Crisfield, M.A., Master--slave approach for the modelling of joints with dependent degrees of freedom in flexible mechanisms, Comm. Num. Meth. Eng. 19, 689-702 (2003) |
|---|---|

| | |
|---|---|
| | 18. Graham, E. and Jelenić, G., A general framework for conservative single-step time-integration schemes with higher-order accuracy for a central-force system, Comp. Meth. Appl. Mech. Eng. 192, 3585-3618 (2003) 19. Munoz, J.J. and Jelenić, G., Sliding contact conditions using the master--slave approach with application on geometrically non-linear beams, Int. J. Solids Struct. 41, 6963-6992 (2004) |

| | |
|---|---|
| **List of publications which serve as a proof of teaching qualifications** | 1. Jelenić, G. and Crisfield, M.A., Dynamic analysis of 3D beams with joints in presence of large rotations, Comp. Meth. Appl. Mech. Eng. 190, 4195-4230 (2001) 2. Crisfield, M.A. and Jelenić, G., Energy/momentum conserving time integration procedures with finite elements and large rotations, NATO Science Series Sub Series III Computer and Systems Sciences, 179, 121-140 (2001) 3. Graham, E., Jelenić, G. and Crisfield, M.A., A note on the equivalence of some recent time-integration schemes for N-body problems, Comm. Num. Meth. Eng. 18, 615-620 (2002) 4. Jelenić, G. and Crisfield, M.A., Problems associated with the use of Cayley transform and tangent scaling for conserving energy and momenta in the Reissner--Simo beam theory, Comm. Num. Meth. Eng. 18, 711-720 (2002) 5. Munoz, J.J., Jelenić, G. and Crisfield, M.A., Master--slave approach for the modelling of joints with dependent degrees of freedom in flexible mechanisms, Comm. Num. Meth. Eng. 19, 689-702 (2003) 6. Graham, E. and Jelenić, G., A general framework for conservative single-step time-integration schemes with higher-order accuracy for a central-force system, Comp. Meth. Appl. Mech. Eng. 192, 3585-3618 (2003) 7. Munoz, J.J. and Jelenić, G., Sliding contact conditions using the master--slave approach with application on geometrically non-linear beams, Int. J. Solids Struct. 41, 6963-6992 (2004) |

| | |
|---|---|
| **Leader of the following research projects** | 1. Advanced Research Fellowship 'Nonlinear finite element method for mechanical problems with spatial rotations' sponsored by Engineering and Physical Sciences Research Council of Great Britain (EPSRC), 1.1.1999-31.12.2003 2. EPSRC research project ´Non-linear finite-element techniques for the design of flexible mechanisms´, PhD student collaborator: Jose Munoz, 1.1.2001-31.12.2003 3. EPSRC CASE studentship, PhD student collaborator: Edward Graham, 1.10.1999-30.9.2002 4. Gordan Jelenić: Improvement of accuracy of non-linear beams with finite 3D rotations(scientific project MZOS No. 114-0000000-3025) |

| | |
|---|---|
| **Participant in the following research projects** | 1. EPSRC research project ´Finite element techniques for rigid and flexible mechanical systems´ supervised by Prof. M.A. Crisfield, 8.10.1994-7.10.1997 2. EPSRC research project ´Finite elements in nonlinear dynamics´ supervised by Prof. M.A. Crisfield, 8.10.1997-7.4.1998 |

| | |
|---|---|
| **Supervision of MSc theses** | 0 |

| | |
|---|---|
| **Supervision of PhD theses** | 2 |

| | |
|---|---|
| **Examination of MSc theses** | 0 |

| | |
|---|---|
| **Examination of PhD theses** | 0 |

| Name of teacher: | BARBARA KARLEUŠA |
|---|---|

| Employed at:<br>Since: | Faculty of Civil Engineering at University of Rijeka<br>02.07.1997. |
|---|---|

| Title:<br>Since:<br>In: | Assistant professor<br>01.07.2006.<br>Hydraulic Engineering and Water Resources Management, Civil Engineering,<br>Technical Sciences |
|---|---|

| e-mail address, web page | barbara.karleusa@gradri.hr; http://www.gradri.hr/?rijeka=staff,65 |
|---|---|
| Knowledge of foreign languages: | English, Italian |
| | |

| Qualifications | - date of birth, nationality: 02.05.1973., Rijeka, Croatian<br>- First degree obtained at: Faculty of Civil Engineering at University of Rijeka, 24.09.1996.<br>- Master degre obtained at: Faculty of Civil Engineering at University of Zagreb, thesis: **Use of Multicriteria Optimisation Methods in Water Management**, 08.04.2002.<br>- Ph.D. degree obtained at: Faculty of Civil Engineering at University of Zagreb, thesis: **Water Management on the Expert System Basis**, 22.11.2005.<br>- additional education:<br>- previous employments: |
|---|---|

| List of papers published in scientific journals | 1. Tadić, Lidija; Ožanić, Nevenka; Tadić, Zdenko; Karleuša, Barbara; Đuroković, Zoran. **Razlike u pristupima izradi planova navodnjavanja u području kontinentalnog i priobalnog dijela Hrvatske**. // Hrvatske vode, Casopis za vodno gospodarstvo. 15 (2007.) , 60; 201-212 (review article).<br>2. Poletan Jugović, Tanja; Baričević, Hrvoje; Karleuša, Barbara. **Višekriterijska optimizacija konkurentnosti paneuropskog koridora Vb**. // Promet - Traffic & Transportation. 18 (2006) , 3; 189-195(review article).<br>3. Karleuša, Barbara; Beraković, Boris; Ožanić, Nevenka. **Primjena ELECTRE TRI metode na izbor varijante navodnjavanja**. // Građevinar : časopis Hrvatskog saveza građevinskih inženjera. 57 (2005) , 1; 21-28 (preliminary note).<br>4. Benac, Čedomir; Rubinić, Josip; Karleuša, Barbara; Jardas, Branka; Oštrić, Maja. **Changes of Hydrogeological Conditions Provoced by Construction in the Coastal Zone of Rijeka.** // RMZ-Material and Geoenvironment. 50 (2003) , 1; 21-24 (journal article).<br>5. Karleuša, Barbara; Deluka-Tibljaš, Aleksandra; Benigar, Milivoj. **Mogućnosti primjene postupaka višekriterijske optimizacije u prometnom planiranju i projektiranju**. // Suvremeni promet. 23 (2003) , 1-2; 104-107 (preliminary note). |
|---|---|

| List of publications which serve as a proof of teaching qualifications | Book chapters:<br>1. Karleuša, Barbara; **Suvremene metode upravljanja sustavima za navodnjavanje** // Knj. 3 : Vodnogospodarski aspekti razvoja navodnjavanja u priobalju i krškom zaleđu Hrvatske / Ožanić, Nevenka (editor). Rijeka : Građevinski fakultet, 2007. Str. 287-320.<br>2. Karleuša, Barbara: **Priprema podloga za primjenu višekriterijske analize u planiranju hidromelioracijskih sustava** // Priručnik za hidrotehničke melioracije, III kolo, knjiga 2, Elementi planiranja sustava za navodnjavanje / Ožanić, Nevenka (editor), Rijeka : Liber, 2005. Str. 11-32.<br>3. Karleuša, Barbara: **Primjena postupaka višekriterijske optimalizacije pri izboru sustava akumulacija za navodnjavanje poljoprivrednih površina u Istri** // Priručnik za hidrotehničke melioracije, Suvremeni pristupi i metode planiranja i upravljanja hidromelioracijskim sustavima / Ožanić, Nevenka (editor), Rijeka : Građevinski Fakultet Sveučilišta u Rijeci, 2003. Str. 269-335.<br>Papers in journals:<br>4. Poletan Jugović, Tanja; Baričević, Hrvoje; Karleuša, Barbara: **Višekriterijska optimizacija konkurentnosti paneuropskog koridora Vb.** // Promet - Traffic & Transportation. 18 (2006), 3; 189-195 (preliminary note).<br>5. Karleuša, Barbara; Beraković, Boris; Ožanić, Nevenka: **Primjena ELECTRE TRI metode na izbor varijante navodnjavanja**. // Građevinar : časopis Hrvatskog saveza građevinskih inženjera. 57 (2005) , |
|---|---|

1; 21-28 (preliminary note).

6. Karleuša, Barbara; Deluka-Tibljaš, Aleksandra; Benigar, Milivoj: **Mogućnosti primjene postupaka višekriterijske optimizacije u prometnom planiranju i projektiranju.** // Suvremeni promet. 23 (2003) , 1-2; 104-107 (preliminary note).

Conference papers with international peer-review:

7. Poletan Jugović, Tanja; Jugović, Alen; Karleuša, Barbara: **Solution Valuating in Transport Planning by Implementation of the Multicriteria Optimisation** // Transportation And Globalization / Zanne, Marinna ; Fabjan, Daša ; Jenček, Peter (editors). Portorož : Fakulteta za pomorstvo in promet, 2006. 32 (international peer-review).

8. Karleuša, Barbara; Beraković, Boris:**The Public Participation in the Water Resources Management on the Expert System Basis** // IX International Symposium on Water Management and Hydraulic Eengineering : Proceedins / Nachtnebel, H.P. ; Jugović, C.J. (editors). Beč, Austrija : BOKU - University of Natural Resources and Applied Life Sciences, 2005. 35-42 (international peer-review).

9. Karleuša, Barbara; Benigar, Milivoj; Deluka-Tibljaš, Aleksandra: **Use of AHP Multicriteria Optimisation Method for the Optimisation of Garage Facility DOK 3 in Rijeka** // 11th International Symposium on Electronics in Traffic ISEP 2003, Proceedings / Anžek, Mario (editor). Ljubljana : Electrotechnical Society of Slovenia, 2003. U6 (international peer-review).

10. Karleuša, Barbara; Beraković, Boris; Ožanić, Nevenka: **Multi-criteria Optimization Methods in Water Management** // Proceedings of the VIII. International Symposium on Water Management and Hydraulic Engineering / Šoltesz, Andrej (editor). Bratislava : Faculty of Civil Engineering, Slovak University of Technology in Bratislava, 2003. 177-185 (international peer-review).

11. Beraković, Boris; Pletikapić, Zlatko; Mahmutović, Zdenko; Karleuša, Barbara: **Prijedlog valorizacije izgradnje objekata i njihovog utjecaja na okoliš** // Hydropower in the New Millenium / Honningsvag, Midttomme, Repp, Vaskinn, Westeren (editors). Bergen : A.A. Balkema, Swets & Zeitlinger, 2001. 173-179 (international peer-review).

Other conference papers:

12. Karleuša, Barbara; Beraković, Boris; Ožanić, Nevenka: **Primjena ekspertnih sustava u gospodarenju vodama** // Hrvatske vode i Europska unija - izazovi i mogućnosti / Gereš, Dragutin (editor). Zagreb: Hrvatske vode, 2007. 937-945.

| Leader of the following research projects | - |
|---|---|

| Participant in the following research projects | **-** Participated in the scientific research project of the Faculty of Civil Engineering University of Rijeka, financed by the MSES RH (form 1997. to 2007. ): **Scientific basis for irrigation in RH**<br>- Participates in the scientific research project of the Faculty of Civil Engineering University of Rijeka, financed by the MSES RH (form 2007.): Hydrology of sensitive water resources in karst (scientific  project MZOS No. 114-0982709-2549; project leader Nevenka Ožanić) |
|---|---|

| **Supervision of MSc theses** | - |
|---|---|

| **Supervision of PhD theses** | - |
|---|---|

| **Examination of MSc theses** | - |
|---|---|

| **Examination of PhD theses** | - |
|---|---|

| Name of teacher: | Boris Kompare |
|---|---|

| Employed at:<br>Since: | University of Ljubljana, Department of Civil Engineering and Geodesy<br>06.06.1980 |
|---|---|

| Title:<br>Since:<br>In: | Associate Professor<br>05.06.2002<br>Sanitary Engineering |
|---|---|

| e-mail address, web page | e-mail: bkompare@fgg.uni-lj.si; www: http://www.fgg.uni-lj.si/izh/ |
|---|---|

| Knowledge of foreign languages: | Croatian, English, Italian |
|---|---|

| Qualifications | **- date of birth, nationality:** 17.06.1956, Republic of Slovenia<br>**- First degree obtained at:** University of Ljubljana, Department of Civil Engineering and Geodesy<br>**- Master degre obtained at:** University of Ljubljana, Department of Civil Engineering and Geodesy<br>**- Ph.D. degree obtained at:** Royal Danish School of Pharmacy, Universitetsparken 2, Copenhagen, Denmark<br>**- additional education:**<br>**- previous employments:** -2000 director of the Institute for hydraulic research |
|---|---|

| List of papers published in scientific journals | **1.** KOMPARE, Boris. O napačnem zbiranju in rabi podatkov v vodarstvu. *Ujma (Ljublj.)*, 1993, št. 7, str. 91-94, ilustr. [COBISS.SI-ID 53866496]<br>**2.** KOMPARE, Boris, BRATKO, Ivan, STEINMAN, Franci, DŽEROSKI, Sašo. Using machine learning techniques in the construction of models. *Ecol. model.*. [Print ed.], 1994, vol. 75/76, str. 617-628. [COBISS.SI-ID 9215783]<br>**3.** KRIŽMAN, Viljem, DŽEROSKI, Sašo, KOMPARE, Boris. Discovering dynamics from measured data. *Elektroteh. vestn.*, 1995, let. 62, št. št.3/4, str. 191-198, ilustr. [COBISS.SI-ID 202337]<br>**4.** DŽEROSKI, Sašo, GRBOVIĆ, Jasna, WALLEY, William J., KOMPARE, Boris. Using machine learning techniques in the construction of models. 2, Data analysis with rule induction. *Ecol. model.*. [Print ed.], 1997, let. 95, št. 1, str. 95-111. [COBISS.SI-ID 205153]<br>**5.** TODOROVSKI, Ljupčo, DŽEROSKI, Sašo, KOMPARE, Boris. Modelling and prediction of phytoplankton growth with equation discovery. *Ecol. model.*. [Print ed.], 1998, letn. 113, str. 71-81. [COBISS.SI-ID 9343961]<br>**6.** KOMPARE, Boris. Estimating environmental pollution by xenobiotic chemicals using QSAR (QSBR) models based on artificial intelligence. *Water sci. technol.*, 1998, vol. 37, no. 8, str. 9-18, graf. prikazi. [COBISS.SI-ID 454497]<br>**7.** DALAKA, Anastasia, KOMPARE, Boris, ROBNIK ŠIKONJA, Marko, SGARDELIS, Stefanos P. Modelling the effects of environmental conditions on apparent photosynthesis of Stipa bromoides by machine learning tools. *Ecol. model.*. [Print ed.], 2000, vol. 129, no. 2/3, str. 245-257, graf. prikazi. [COBISS.SI-ID 2130772]<br>**8.** KOMPARE, Boris, TODOROVSKI, Ljupčo, DŽEROSKI, Sašo. Modeling and prediction of phytoplankton growth with equation discovery : case study - Lake Glunso, Denmark. *Verh. - Int. Ver. Theor. Angew. Limnol.*, 2001, vol. 27, str. 3626-3631. [COBISS.SI-ID 16580135]<br>**9.** ATANASOVA, Nataša, KOMPARE, Boris. Uporaba odločitvenih dreves pri modeliranju čistilne naprave za odpadno vodo = The use of decision trees in the modelling of a wastewater treatment plant. *Acta hydrotech.*, 2002, let. 20, št. 33, str. 351-370, ilustr. [COBISS.SI-ID 1852769]<br>**10.** ATANASOVA, Nataša, KOMPARE, Boris. Uporaba odločitvenih dreves pri modeliranju čistilne naprave za odpadno vodo = The use of decision trees in the modelling of a wastewater treatment plant. *Acta hydrotech. (Online)*. [Online ed.], 2002, let. 20, št. 33, str. 351-370, ilustr. http://ksh.fgg.uni-lj.si/KSH/acta/index.htm. [COBISS.SI-ID 1853025]<br>**11.** URŠIČ, Matej, KOMPARE, Boris. Izboljšava obrazcev za račun hidravličnih trenjskih izgub za tok pod tlakom v ceveh krožnega prereza = Improvement of the hydraulic friction losses equations for flow under pressure in circular pipes. *Acta hydrotech.*, 2003, vol. 21, št. 34, str. 57-74, ilustr. [COBISS.SI-ID 2569825]<br>**12.** URŠIČ, Matej, KOMPARE, Boris. Izboljšava obrazcev za račun hidravličnih trenjskih izgub za tok pod tlakom v ceveh krožnega prereza = Improvement of the hydraulic friction losses equations for flow under pressure in circular pipes. *Acta hydrotech. (Online)*. [Online ed.], 2003, vol. 21, št. 34, str. 57-74, ilustr. ftp://ksh.fgg.uni-lj. si/acta/a34mu.pdf. [COBISS.SI-ID 2414945]<br>**13.** DŽEROSKI, Sašo, BLOCKEEL, Hendrik, KOMPARE, Boris, KRAMER, Stefan, PFAHRINGER, |
|---|---|

| | Bernhard, VAN LAER, Wim. Experiments in predicting biodegradability. *Appl. artif. intell.*, 2004, vol. 18, str. 157-181. [COBISS.SI-ID 18198567] |
|---|---|

| | |
|---|---|
| **List of publications which serve as a proof of teaching qualifications** | **1.** KOMPARE, Boris. *Modeliranje deževnega odtoka iz urbaniziranih povodij*. Ljubljana: Fakulteta za arhitekturo, gradbeništvo in geodezijo, VTOZD Gradbeništvo in geodezija, Inštitut za zdravstveno hidrotehniko, 1991. 509, 12 str., ilustr. ISBN 86-80233-14-5. [COBISS.SI-ID 22789888]<br>**2.** KOMPARE, Boris, BRATKO, Ivan, STEINMAN, Franci, DŽEROSKI, Sašo. Using machine learning techniques in the construction of models. *Ecol. model.*. [Print ed.], 1994, vol. 75/76, str. 617-628. [COBISS.SI-ID 9215783]<br>**3.** KRIŽMAN, Viljem, DŽEROSKI, Sašo, KOMPARE, Boris. Discovering dynamics from measured data. *Elektroteh. vestn.*, 1995, let. 62, št. št.3/4, str. 191-198, ilustr. [COBISS.SI-ID 202337]<br>**4.** DŽEROSKI, Sašo, GRBOVIĆ, Jasna, WALLEY, William J., KOMPARE, Boris. Using machine learning techniques in the construction of models. 2, Data analysis with rule induction. *Ecol. model.*. [Print ed.], 1997, let. 95, št. 1, str. 95-111. [COBISS.SI-ID 205153]<br>**5.** TODOROVSKI, Ljupčo, DŽEROSKI, Sašo, KOMPARE, Boris. Modelling and prediction of phytoplankton growth with equation discovery. *Ecol. model.*. [Print ed.], 1998, letn. 113, str. 71-81. [COBISS.SI-ID 9343961]<br>**6.** KOMPARE, Boris. Estimating environmental pollution by xenobiotic chemicals using QSAR (QSBR) models based on artificial intelligence. *Water sci. technol.*, 1998, vol. 37, no. 8, str. 9-18, graf. prikazi. [COBISS.SI-ID 454497]<br>**7.** DALAKA, Anastasia, KOMPARE, Boris, ROBNIK ŠIKONJA, Marko, SGARDELIS, Stefanos P. Modelling the effects of environmental conditions on apparent photosynthesis of Stipa bromoides by machine learning tools. *Ecol. model.*. [Print ed.], 2000, vol. 129, no. 2/3, str. 245-257, graf. prikazi. [COBISS.SI-ID 2130772]<br>**8.** KOMPARE, Boris, TODOROVSKI, Ljupčo, DŽEROSKI, Sašo. Modeling and prediction of phytoplankton growth with equation discovery : case study - Lake Glunso, Denmark. *Verh. - Int. Ver. Theor. Angew. Limnol.*, 2001, vol. 27, str. 3626-3631. [COBISS.SI-ID 16580135]<br>**9.** ATANASOVA, Nataša, KOMPARE, Boris. Uporaba odločitvenih dreves pri modeliranju čistilne naprave za odpadno vodo = The use of decision trees in the modelling of a wastewater treatment plant. *Acta hydrotech.*, 2002, let. 20, št. 33, str. 351-370, ilustr. [COBISS.SI-ID 1852769]<br>**10.** ATANASOVA, Nataša, KOMPARE, Boris. Uporaba odločitvenih dreves pri modeliranju čistilne naprave za odpadno vodo = The use of decision trees in the modelling of a wastewater treatment plant. *Acta hydrotech. (Online)*. [Online ed.], 2002, let. 20, št. 33, str. 351-370, ilustr. http://ksh.fgg.uni-lj. si/KSH/acta/index.htm. [COBISS.SI-ID 1853025]<br>**11.** URŠIČ, Matej, KOMPARE, Boris. Izboljšava obrazcev za račun hidravličnih trenjskih izgub za tok pod tlakom v ceveh krožnega prereza = Improvement of the hydraulic friction losses equations for flow under pressure in circular pipes. *Acta hydrotech.*, 2003, vol. 21, št. 34, str. 57-74, ilustr. [COBISS.SI-ID 2569825]<br>**12.** URŠIČ, Matej, KOMPARE, Boris. Izboljšava obrazcev za račun hidravličnih trenjskih izgub za tok pod tlakom v ceveh krožnega prereza = Improvement of the hydraulic friction losses equations for flow under pressure in circular pipes. *Acta hydrotech. (Online)*. [Online ed.], 2003, vol. 21, št. 34, str. 57-74, ilustr. ftp://ksh.fgg.uni-lj. si/acta/a34mu.pdf. [COBISS.SI-ID 2414945]<br>**13.** DŽEROSKI, Sašo, BLOCKEEL, Hendrik, KOMPARE, Boris, KRAMER, Stefan, PFAHRINGER, Bernhard, VAN LAER, Wim. Experiments in predicting biodegradability. *Appl. artif. intell.*, 2004, vol. 18, str. 157-181. [COBISS.SI-ID 18198567] |

| | |
|---|---|
| **Leader of the following research projects** | Development of a groundwater protection policy for agricultural regions in the Drava River Basin (PHARE B5-98-019), 7/1999-5/2000, Slovenian leader |

| | |
|---|---|
| **Participant in the following research projects** | Sewerage And Waste Water Treatment in the Adriatic Coastal Area (INTERREG III B CADSES SAWWTACA), 12/2003 - 11/2006 |

| | |
|---|---|
| **Supervision of MSc theses** | 3 |

| | |
|---|---|
| **Supervision of PhD theses** | 2 |

| **Examination of MSc theses** | 3 |
|---|---|

| **Examination of PhD theses** | 6 |
|---|---|

| Name of teacher: | Zorko Kos |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br>01.09.1976 |
|---|---|

| Title:<br>Since:<br>In: | Professor emeritus<br>05.10.2001.<br>Hydraulic engineering |
|---|---|

| e-mail address, web page | |
|---|---|

| Knowledge of foreign languages: | English, Italian, French |
|---|---|

| Qualifications | **- date of birth, nationality:** 02.02.1930, Republic of Croatia<br>**- First degree obtained at:** University of Zagreb, Department of Civil Engineering<br>**- Master degre obtained at:**<br>**- Ph.D. degree obtained at:** University of Zagreb, Department of Civil Engineering<br>**- additional education:** spcialisation in melioration; 1959 (Italiy), 1977 (USA)<br>**- previous employments:** 1956-61. Istrian water utility – director; 1962-65. Ministry of agriculture of Libya – irrigation advisor; 1966-76. General water management company for the litoral and Istrian catchment areas - director |
|---|---|

| List of papers published in scientific journals | Kos, Z. Conjunctive Use of Surface and Underground Waters in the Istra Peninsula, Yugoslavia, Water International, Urbana, II. 3 (1981, 122-125.<br>Kos, Z. Long-Term Water Resources Plan for Istra Peninsula, Yugoslavia. Water International, Urbana, II. (1986), 175-184.<br>Kos, Z. Conjunctibe Use of Water for Irrigation, Municipal and Industrial Water Supply in Istra, Yugoslavia. Agricultural Water Management. Elcevier Science Publishers. Amsterdam, 13 (1988), 211-224.<br>Kos, Z. Upotreba visokomineralizirane vode za potrebe navodnjavanja. Građevinar, 16 (1964.) 8, 286-294.<br>Kos, Z. Proračun odvodne melioracione mreže. Građevinar, 19 (1967.) 2, 42-54.<br>Kos, Z. Tehničke i hidrauličke karakteristike kapalica i natapanja kapanjem. Građevinar, 5 (1977.), 174-182.<br>Kos, Z. Simuliranje otjecanja pomoću hidrološkog modela sliva. Građevinar, 5 (1978.), 175-182.<br>Kos, Z. Proračun potrebne količine vode za navodnjavanje metodom Blaney-Criddle. Građevinar, 11 (1978.), 467-478.<br>Kos, Z. Vodoprivredni sustavi. Građevinar, 7 (1981.), 291-298.<br>Kos, Z. Dugoročni razvoj vodoprivrede u Istri. Građevinar, 35 (1983.) 4, 169-175.<br>Kos, Z. Vodoprivredni plan Istre. vodoprivreda, 57-61 (1979.), 215-219.<br>Kos, Z. Fizičke i kemijske osobine natapne vode. Vodoprivreda, 20, 111-112 (1988/1-2), 39-50.<br>Kos, Z. Razvoj i stanje standarda za upotrebu otpadnih voda za natapanje. Vodoprivreda 20, 113-114, (1988/3-4), 151-157.<br>Kos, Z. Iskustva i standardi nekih zemalja u korištenju voda niže kvalitete za natapanje. Vodoprivreda 20, 116 (1988.) 6, 317-325.<br>Kos, Z.; Kos, E. Značajni zahvati podzemne vode u kršu Riječke regije. Vodoprivreda, 21, 117-118- (1989/1-2), 117-127.<br>Kos, Z. Potreba, principi i načini održavanja odvodnih hidromelioracijskih sustava. Vodoprivreda, 23, 129-130 (1991/1-2), 61-74.<br>Kos, Z. Kvaliteta vode za stočarstvo i ribogojstvo. vodoprivreda, 22, 125-126 (1990/1-2), 381-386.<br>Tomić, F.; Kos, Z.; Mađar, S. Navodnjavanje – dio suvremene proizvodnje. Poljoprivredne aktualnosti, Vol. 39, 3-4/91., 339-404.<br>Kos, Z. Vodoprivreda u budućnosti. Hrvatske vode, 1 (1993.) 1, 17-24.<br>Kos, Z. Vodoprivreda u budućnosti, II dio. Hrvatske vode, 1 (1993.) 3, 165-173. |
|---|---|

| List of publications which serve as a proof of teaching qualifications | **Kos, Z. Hidrotehničke melioracije tla. Navodnjavanje. Zagreb. Školska knjiga, 1987., 216 str.**<br>Kos, Z. Hidrotehničke melioracije tla. Odvodnjavanje. Zagreb. Školska knjiga, 1989., 156 str.<br>Kos, Z. Hidrotehničke melioracije tla. Kvaliteta vode za navodnjavanje. Zagreb. Školska knjiga, 1991., 115 str.<br>Vodoprivreda gornjeg Jadrana. Povijest razvoja vodnog graditeljstva na vodnom području Primorsko-istarskih slivova. Izdavač: Adamić, Rijeka (u tisku).<br>Kos, Z. Vodoprivreda gornjeg Jadrana 1864-1974. Monografija. Poglavlja: Uvodno, Historijat i Zaključno. Opće vodoprivredno poduzeće rijeka, 1974., 6-18.<br>Kos, Z. Razvoj i stanje hidromelioracija u Jugoslaviji i u nekim europskim zemljama. Priručnik za hidrotehničke melioracije I. kolo, knjiga 1. Društvo za odvodnjavanje i navodnjavanje Hrvatske (DONH), Zagreb, 1983., 19-50.<br>Kos, Z.; Ekl, B. Povijesni pregled razvoja vodoprivrede u SR Hrvatskoj. Priručnik za hidrotehničke melioracije, I. kolo, |
|---|---|

| | |
|---|---|
| | knjiga 1. DONH, Zagreb, 1983., 51-115.<br>Kos, Z. Potreba vode kulturnog bilja. Priručnik za hidrotehničke melioracije, I. kolo, knjiga 2. DONH, Zagreb, 1984., 154-184.<br>Kos, Z. Osnovni principi planiranja vodoprivrednih, posebno odvodnih sustava. Priručnik za hidrotehničke melioracije, I. kolo, knjiga 3. DONH, Zagreb, 19854., 7-29.<br>Kos, Z. Združeno dimenzioniranje osnovne i detaljne otvorene odvodne mreže. Priručnik za hidrotehničke melioracije, I. kolo, knjiga 4. DONH, Zagreb, 1987., 7-28.<br>Kos, Z.; Marušić, J. Tipske građevine i materijali drenskih mreža. priručnik za hidrotehničke melioracije, I. kolo, knjiga 4. DONH, Zagreb, 1987., 147-167.<br>Kos, . Potreba, principi i načini održavanja odvodnih hidromelioracijskih sustava. Priručnik za hidrotehničke melioracije, I. kolo, knjiga 6. DONH, Zagreb, 1991., 1-23.<br>Kos, Z. Povijesni pregled razvoja navodnjavanja. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 1. Građevinski fakultet Rijeka, 1992., 1-60.<br>Kos, Z. Uvod. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 2. Građevinski fakultet Rijeka, 1993., 1-11.<br>Kos, Z. Direktne metode određivanja evapotranspiracije. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 2. Građevinski fakultet Rijeka, 1993., 12-22.<br>Kos, Z.; Tomić, F.; Plišić, I. Izbor koeficijenta usjeva Kc. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 2. Građevinski fakultet Rijeka, 1993., 91-103.<br>Kos, Z. Analiza utjecajnih faktora na ET usjeva. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 2. Građevinski fakultet Rijeka, 1993., 105-122.<br>Kos, Z.; Tomić, F.; Plišić, I. Proračun potreba za vodom. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 2. Građevinski fakultet Rijeka, 1993., 123-158.<br>Kos, Z.; Plišić, I. Natapanje prelijevanjem. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 3. Građevinski fakultet Rijeka, 1994., 29-54.<br>Kos, Z. Natapanje potapanjem. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 3. Građevinski fakultet Rijeka, 1994., 63-80.<br>Kos, Z. Natapanje infiltracijom. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 3. Građevinski fakultet Rijeka, 1994., 93-116.<br>Kos, Z. Lokalizirano natapanje. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 3. Građevinski fakultet Rijeka, 1994., 185-197.<br>Kos, Z. Natapni sustavi. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 4. Građevinski fakultet Rijeka, 1995., 5-13.<br>Kos, Z. Glavne građevine sustava za natapanje. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 4. Građevinski fakultet Rijeka, 1995., 63-115.<br>Kos, Z. Oprema za površinske načine. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 4. Građevinski fakultet Rijeka, 1995., 169-175.<br>Kos, Z. Uvod. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 5. Građevinski fakultet Rijeka, 1996., 1-6.<br>Kos, Z. Osnovne podloge za planiranje natapnih sustava. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 5. Građevinski fakultet Rijeka, 1996., 7-25.<br>Kos, Z. Projektiranje i optimalizacija mreža pod tlakom. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 5. Građevinski fakultet Rijeka, 1996., 51-86.<br>Kos, Z. Organizacija i održavanje natapnih sustava. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 5. Građevinski fakultet Rijeka, 1996., 207-246.<br>Kos, Z. Uvod. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 6. Građevinski fakultet Rijeka, 1997., 1-4.<br>Kos, Z. Kriteriji kvalitete vode za natapanje. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 6. Građevinski fakultet Rijeka, 1997., 5-68.<br>Kos, Z. Kriteriji kvalitete vode za stočarstvo i ribogojstvo. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 6. Građevinski fakultet Rijeka, 1997., 79-91.<br>Kos, Z. Upotreba otpadne vode za natapanje. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 6. Građevinski fakultet Rijeka, 1997., 155-194.<br>Kos, Z. Iskustva i standardi nekih zemalja u korištenju voda niže kvalitete za natapanje. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 6. Građevinski fakultet Rijeka, 1997., 209-232.<br>Kos, Z. Uvod. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 7. Građevinski fakultet Rijeka, 1999., 1-4.<br>Kos, Z. Mehanizacija i oprema za natapanje kišenjem. Priručnik za hidrotehničke melioracije, II. kolo, knjiga 7. Građevinski fakultet Sveučilišta u Rijeci, 1999., 15-75. |
| **Leader of the following research projects** | UNDP/FAO projekt YUG/73/009 Water Resoruces Planning and their Exploitation in Istra, Yugoslavia, voditelj (direktor) projekta od početka do kraja (1972-1986.).<br>1981-85. Tema 26/1. Introdukcija navodnjavanja u obalnom pojasu gornjeg Jadrana, financijer: SIZ-III (znanosti).<br>1981-85. Tema 26/2. Introdukcija novih metoda odvodnjavanja na području Istre s posebnim osvrtom na uvođenje cijevne drenaže, financijer: SIZ-III (znanosti).<br>1986-90. Zadatak 01.04.06.02.001. Postupci i metode za optimalizaciju građevina i sustava u području |

| | |
|---|---|
| | hidrotehničkih melioracija, financijer: SIZ-III (znanosti). |
| | 1990-95. Projekt 2-11-059. Znanstvene osnove za razvoj navodnjavanja u Hrvatskoj., financijer: Ministarstvo znanosti RH |
| | 1985-90. Koordinator svih znanstvenih projekata iz područja hidrotehnike u Građevinskom institutu. |
| | 1981-85. Član Projektnog savjeta "Istraživanja građevinskog materijala mineralnog porijekla i građevinsko tehnologije" |

| | |
|---|---|
| **Participant in the following research projects** | |

| | |
|---|---|
| **Supervision of MSc theses** | 5 |

| | |
|---|---|
| **Supervision of PhD theses** | 3 |

| | |
|---|---|
| **Examination of MSc theses** | 10 |

| | |
|---|---|
| **Examination of PhD theses** | 6 |

| Name of teacher: | VEDRANA KOZULIĆ |
|---|---|

| Employed at: | University of Rijeka, Department of Civil Engineering |
|---|---|
| Since: | 1. 04. 2002 |

| Title: | Assistant Professor |
|---|---|
| Since: | 27. 02. 2002 |
| In: | Engineering Mechanics |

| e-mail address, web page | Vedrana.Kozulic@gradst.hr |
|---|---|

| Knowledge of foreign languages: | English |
|---|---|

| Qualifications | - **date of birth, nationality:** 13. 01. 1962, Republic of Croatia <br> - **First degree obtained at:** University of Split, Department of Civil Engineering <br> - **Master degre obtained at:** University of Split, Department of Civil Engineering <br> - **Ph.D. degree obtained at:** University of Split, Department of Civil Engineering <br> - **additional education:** <br> - **previous employments:** 1. 09. 1990. - 1. 04. 2002. University of Split, Department of Civil Engineering |
|---|---|

| List of papers published in scientific journals | 1) B. Gotovac, V. Kozulić: "Numerical analysis of engineering structures composed of surface and line elements", International Journal for Engineering Modelling, Vol. 7, No. 3-4, pp. 97-108, 1994 <br> 2) B. Gotovac and V. Kozulić: "On a selection of basis functions in numerical analyses of engineering problems", International Journal for Engineering Modelling, Vol. 12, No. 1-4, pp. 25-41, 1999. <br> 3) V. Kozulić and B. Gotovac: "Numerical analyses of 2D problems using $Fup_n(x,y)$ basis functions", International Journal for Engineering Modelling, Vol. 13, No. 1-2, pp. 7-18, 2000. <br> 4) B. Gotovac and V. Kozulić: "Numerical solving of initial-value problems by $R_{bf}$ basis functions", Int. J. Structural Engineering and Mechanics, Vol. 14, No. 3, pp. 263-285, 2002. <br> 5) H. Gotovac, R. Andričević, B. Gotovac, V. Kozulić, M. Vranješ: "An improved collocation method for solving the Henry problem", Journal of Contaminant Hydrology, **64** (2003), 1-2; pp. 129-149, 2003. |
|---|---|

| List of publications which serve as a proof of teaching qualifications | 1) B. Gotovac and V. Kozulić: "On a selection of basis functions in numerical analyses of engineering problems", International Journal for Engineering Modelling, Vol. 12, No. 1-4, pp. 25-41, 1999. <br> 2) V. Kozulić and B. Gotovac: "Numerical analyses of 2D problems using $Fup_n(x,y)$ basis functions", International Journal for Engineering Modelling, Vol. 13, No. 1-2, pp. 7-18, 2000. <br> 3) V. Kozulić and B. Gotovac: "Hierarchic generation of the solutions of non-linear problems", European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2000), CD-Rom Proceedings, pp. 1-18, Barcelona, 2000. <br> 4) B. Gotovac, V. Kozulić: "FFCM in elasto-plastic analysis of the torsion of prismatic bars", VIIIth International Conference Numerical Methods in Continuum Mechanics (NMCM 2000), CD-Rom Proceedings, Paper No. 024, pp. 1-16, Liptovský Ján, Slovak Republic, 2000. <br> 5) B. Gotovac, V. Kozulić: "Analyses of Thin Plate Bending by Fup Fragment Collocation Method", Proceedings of the Euroconference on Computational Mechanics and Engineering Practice (COMEP 2001), pp. 156-161, Szczyrk, Poland, 2001. <br> 6) B. Gotovac and V. Kozulić: "Numerical solving of initial-value problems by $R_{bf}$ basis functions", Int. J. Structural Engineering and Mechanics, Vol. 14, No. 3, pp. 263-285, 2002. <br> 7) H. Gotovac, R. Andričević, B. Gotovac, V. Kozulić, M. Vranješ: "An improved collocation method for solving the Henry problem", Journal of Contaminant Hydrology, **64** (2003), 1-2; pp. 129-149, 2003. |
|---|---|

| Leader of the | Vedrana Kozulić, Adaptive meshless modelling in design of civil engineering structures (scientific |
|---|---|

| following research projects | project MZOS No.  083-0831541-1534) |
|---|---|

| Participant in the following research projects | **Nelinearno numeričko modeliranje građevinskih konstrukcija**, 1991-1995.<br>**Numeričko modeliranje inženjerskih konstrukcija**, 1997-2000.<br>**Numeričko modeliranje prostornih inženjerskih konstrukcija**, 2000-2002.<br>**Suvremeno numeričko modeliranje tunela i podzemnih građevina**, 2002-2005<br>**Numeričko modeliranje kvazi-krtih materijala**, 2002-2005 |
|---|---|

| Supervision of MSc theses | 0 |
|---|---|

| Supervision of PhD theses | 0 |
|---|---|

| Examination of MSc theses | 0 |
|---|---|

| Examination of PhD theses | 1 |
|---|---|

| Name of teacher: | Ivica Kožar |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br>May 1985 |
|---|---|

| Title:<br>Since:<br>In: | Full Professor<br>October 2001<br>Engineering Mechanics |
|---|---|

| e-mail address, web page | ivicak@gradri.hr, www.gradri.hr/~ivicak, www.gradri.hr/~modeliranje |
|---|---|

| Knowledge of foreign languages: | English, German, Italian |
|---|---|

| Qualifications | **- date of birth, nationality:** 22.08.1959. Republic of Croatia<br>**- First degree obtained at:** University of Rijeka, Department of Civil Engineering<br>**- Master degre obtained at:**<br>**- Ph.D. degree obtained at:** University of Zagreb, Department of Civil Engineering<br>**- additional education:**<br>**1)** postdoctoral research (15.01.1994-15.07.1994) at Ecole Polytechnique Federale de Lausanne, DGC, LSC, CH-1015 Lausanne, Switzerland<br>**2)** visiting researcher (01.10.1994-31.03.1995 and 1.01.1996-31.03.1996) at Universitat Stuttgart, Institut fur Werkstoffe im Bauwesen, Pfaffenwaldring 4, 70550 Stuttgart, Deutschland<br><br>**- previous employments:** |
|---|---|

| List of papers published in scientific journals | - Kožar, I. and Ibrahimbegović, A.: The Finite Element Formulation of a Finite Rotation Solid Element, Finite Elements in Analysis and Design (0168-874X), Nostran Van Holland, 1995 (20) p.101-126<br>- Ibrahimbegović, A., Kožar, I. and Frey, F.: Computational Aspects of Vector-like Parameterization of Three-Dimensional Finite Rotations, International Journal for Numerical Methods in Engineering (0029-5981), 1995 (38) p.1-15<br>- Ibrahimbegović, A. and Kožar, I.: Nonlinear Wilson's Brick Element for Finite Elastic Deformation of Three-Dimensional Solids, Communications in Numerical Methods in Engineering (0748-8025), 1995 (11) p.655-664<br>- Kožar, Ivica, Novaković, M., Pavlovec, E.: Analysis of Plate on Elastic Foundation using 8-node Serendipity Element, Int.J.Engineering Modelling, (8) , No.3-4, 1995, ISSN 1330 1365, p.65-70<br>- Ožbolt, Joško, Y.-J. Li and Kožar, Ivica: Microplane Model for Concrete with Relaxed Kinematic Constraint, International Journal of Solids and Structures, 2001(38/16), p. 2683-2711<br>- Štimac, I., Meštrović, D., Kožar, I.: Analysis of bridge structures excited by moveable load (in Croatian), GRAĐEVINAR (0350-2465) **56** (2004), 6; 347-353<br>- Ožbolt, J., Kožar, I., Eligehausen, R., and Periškić, G., (2005). "Instationäres 3D Thermo-mechanisches Modell für Beton," *Beton und Stahlbetonbau*, (0005-9900) **100** (2005),1; 39-51. |
|---|---|

| List of publications which serve as a proof of teaching qualifications | Software:<br>- Program za linearni i dinamički izračun ravninskih konstrukcija metodom konačnih elemenata<br>- Program za linearni i dinamički izračun osno simetričnih ljuski<br>- Program za nelinearni izračun prostornih ljuski<br>- Program za nelinearni izračun prostornih betonskih konstrukcija (u suradnji s IWB Uni. Stuttgart)<br>- Program za dimenzioniranje armiranobetonskih konstrukcija<br>- Program za izračun fizike zgrade objekata visokogradnje<br>- Program za procjenu zvučnih otpora objekata visokogradnje<br>- Program za izračun i crtanje uzdužnih profila vodovoda i kanalizacije<br>- Program za dinamičku analizu 2D konstrukcija pobuđenih prolaskom vozila ( http://www.gradri.hr/~modeliranje<br>- Program za 3D nestacionarnu analizu raspodjele topline za Institut für Werkstoffe im Bauwesen Universität Stuttgart |
|---|---|

| | |
|---|---|
| **Leader of the following research projects** | - Joint research project with Germany, Instütut für Werkstoffe im Bauwesen, Universität Stuttgart: "Erstellung eines 3D FE Programms für die Ermittlung der Temperatur- und Feuchteverteilung", 2003<br>- Joint research project with Slovenia: "Modeliranje nastajanja i širenja oštećenja u inženjerskim materijalima", 1998-2000, 2001-2003<br>- Joint research project with Great Britain: "Investigation of Damage Evolution in Continuum Modelling of Quasibrittle Materials", 1998-2000<br>- Technical project TP-02/0114-02: "Utjecaj pokretnog opterećenja na konstrukcije"<br>- Research project 0114002: "Numeričko modeliranjue kvazi-krtih materijala", 2002-2004<br>- Research project 114102: "Numerička analiza kvazi-krtih materijala", 1997-2001.<br>- Research project 2-11-449: "Dinamička analiza lameliranih ploča pod udarnim opterećenjem", 1993-1996.<br>- Ivica Kožar: Flexible long structures: non-linear modelling with visulaization (scientific  project MZOS No. 114-0982562-1460) |

| | |
|---|---|
| **Participant in the following research projects** | Ivica Kožar: Numerical 3D chemo-hygro-thermo-mechanical model of concrete (scientific  project MZOS No. 114-0000000-3145; project leader Joško Ožbolt) |

| | |
|---|---|
| **Supervision of MSc theses** | 1 |

| | |
|---|---|
| **Supervision of PhD theses** | 0 |

| | |
|---|---|
| **Examination of MSc theses** | 5 |

| | |
|---|---|
| **Examination of PhD theses** | 1 |

| Name of teacher: | Janko Logar |
|---|---|

| Employed at:<br>Since: | University of Ljubljana, Department of Civil Engineering and Geodesy<br>1.1.1986 |
|---|---|

| Title:<br>Since:<br>In: | Assistant Professor<br>4.2.2004<br>Geotechnical Engineering |
|---|---|

| e-mail address, web page | jlogar@fgg.uni-lj.si |
|---|---|
| Knowledge of foreign languages: | English, Italian, Spanish, German |

| Qualifications | - **date of birth, nationality:** 14.6.1962, Republic of Slovenia<br>- **First degree obtained at:** University of Ljubljana, Department of Civil Engineering and Geodesy<br>- **Master degre obtained at:** University of Ljubljana, Department of Civil Engineering and Geodesy<br>- **Ph.D. degree obtained at:** University of Ljubljana, Department of Civil Engineering and Geodesy<br>- **additional education:** Workshops in rock mechanics (prof. Hoek, prof. Hudson) and tunnel structures (prof. Schubert)<br>- **previous employments:** |
|---|---|

| List of papers published in scientific journals | LOGAR, Janko, TURK, Goran. Neural network as a constitutive model of soil. Z. angew. Math. Mech., 1997, vol. 77, suppl. 1, str. 195-196, graf. prikazi. [COBISS.SI-ID 258657]<br><br>TURK, Goran, LOGAR, Janko, MAJES, Bojan. Modelling soil behaviour in uniaxial strain conditions by neural networks. Adv. eng. softw. (1992). [Print ed.], 2001, vol. 32, str. 805-812, graf. prikazi. [COBISS.SI-ID 1475681]<br><br>MAJES, Bojan, PETKOVŠEK, Ana, LOGAR, Janko. Primerjava materialnih lastnosti drobirskih tokov iz plazov Stože, Slano blato in Strug = The comparisson of material properties of debries flows from Stože, Slano blato and Strug landslides. Geologija, 2002, let. 45, št. 2, str. 457-463. [COBISS.SI-ID 922197]<br>KLOPČIČ, Jure, ŠTIMULAK, Andrej, AJDIČ, Igor, LOGAR, Janko. Računalniško podprta analiza meritev v predoru = Computer supported analysis of displacement monitoring data in tunneling. Gradb. vestn., oktober 2004, letn. 53, št. 10, str. 246-255, graf. prikazi. [COBISS.SI-ID 2517345] |
|---|---|

| List of publications which serve as a proof of teaching qualifications | LOGAR, Janko. Študijsko gradivo za predmet Zemeljska dela na Univerzitetnem študiju gradbeništva. Objavljeno na spletnem naslovu: http://www.fgg.uni-lj.si/kmtal/GR-UNI/ZD/ZD%20-%20skripta.htm<br><br>LOGAR, Janko. Študijsko gradivo za predmet Zemeljska dela na Univerzitetnem študiju vodarstva in komunalnega inženirstva. Objavljeno na spletnem naslovu: http://www.fgg.uni-lj.si/kmtal/VKI-UNI/ZD/ZD%20VKI%20-%20skripta.htm<br><br>LOGAR, Janko. Študijsko gradivo za predmet Geotehnične gradnje na Visokošolskem strokovnem študiju gradbeništva. Objavljeno na spletnem naslovu: http://www.fgg.uni-lj.si/kmtal/GR_VSS/GG/GG%20-%20skripta.htm<br><br>LOGAR, Janko. Študijsko gradivo za predmet Geotehnika prometnic na Visokošolskem strokovnem študiju gradbeništva. Objavljeno na spletnem naslovu: http://www.fgg.uni-lj.si/kmtal/GR_VSS/GP/GP%20-%20skripta.htm |
|---|---|

| Leader of the following research projects | LOGAR, Janko, KUDER, Sebastjan, ROBAS, Alenka, MAJES, Bojan. Uvajanje presiometrskih raziskav v projektiranje in kontrolo kvalitete pri cestogradnji : raziskovalna naloga : končno poročilo. Ljubljana: UL, Fakulteta za gradbeništvo in geodezijo, 2002. Zv. 1 (70 str.), graf. prikazi. [COBISS.SI-ID 1950049]<br><br>LOGAR, Janko, MAJES, Bojan, PETKOVŠEK, Ana, PULKO, Boštjan, ROBAS, Alenka, JUVANC, Alojzij, RIJAVEC, Robert, ŽURA, Marijan, BOKAN-BOSILJKOV, Violeta, STOPAR, Bojan, AMBROŽIČ, Tomaž, ŽLENDER, Bojan, MACUH, Borut, LIKAR, Jakob, MARINKO, Anton, BRLEK, Simon, BORKO, Andrej. Izdelava strokovnih podlag za "Pravilnik o tehničnih normativih in pogojih za projektiranje cestnih predorov v Republiki Sloveniji" : strokovno razvojna naloga : končno poročilo dopolnjeno po pripomba h naročnika. Ljubljana: Fakulteta za gradbeništvo in goedezijo, Katedra za mehaniko tal z laboratorijem, 2003. 105 f., graf. prikazi. [COBISS.SI-ID 1992801] |
|---|---|

|  | LOGAR, Janko, PULKO, Boštjan, SELAN, Vanja, KUDER, Sebastjan. Racionalizacija pri uporabi trajnih geotehničnih sider : končno poročilo. Ljubljana: UL, Fakulteta za gradbeništvo in geodezijo, 2004. 127 str., ilustr., graf. prikazi. [COBISS.SI-ID 2359137 |
|---|---|

| **Participant in the following research projects** | PETKOVŠEK, Ana, LOGAR, Janko, ROBAS, Alenka. Kakovostno vgrajevanje in nadzorovanje vgrajevanja cevnih vodov v cestnem telesu : končno poročilo. Ljubljana: Gradbeni inštitut ZRMK: Univerza v Ljubljani, FGG, 2001. 46 str., pril., ilustr. [COBISS.SI-ID 862549] |
|---|---|

| **Supervision of MSc theses** | 3 |
|---|---|

| **Supervision of PhD theses** | 1 |
|---|---|

| **Examination of MSc theses** | 4 |
|---|---|

| **Examination of PhD theses** | 2 |
|---|---|

| Name of teacher: | Leo Matešić |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br>01.12.2002. |
|---|---|

| Title:<br>Since:<br>In: | Assistant Professor<br>11.06.2002.<br>Geotechnical Engineering |
|---|---|

| e-mail address, web page | leomat@gradri.hr |
|---|---|

| Knowledge of foreign languages: | English |
|---|---|

| Qualifications | **- date of birth, nationality:** 18.4.1968, Republic of Croatia<br>**- First degree obtained at:** University of Zagreb, Department of Civil Engineering<br>**- Master degre obtained at:** University of Zagreb, Department of Civil Engineering<br>**- Ph.D. degree obtained at:** University of Zagreb, Department of Civil Engineering<br>**- additional education:** 2003, Internal assesment of the system of quality management according to ISO 9001:2000 2002, Lab organisation according to HRN EN ISO 17025<br>**- previous employments:** 1993 - 2001University of Zagreb, Department of Civil Engineering; 2001 - 2002 University of Zagreb, Faculty of minig, gelogogy and petroleum engineering |
|---|---|

| List of papers published in scientific journals | 1. Kvasnička, P., Matešić, L., Skračić, S. (1998), Izrada geotehničkih podloga Zagreba primjenom GIS-a, *Građevinar*, Hrvatski savez građevinskih inženjera, Vol. 50 No. 1 pp 19-28, Zagreb 1998.<br>2. Čalogović, V., Matešić, L. i Kvasnička, P. (1998), Specifična propustljivost u nesaturiranim glinovitim tlima, *Građevinar*, Hrvatski savez građevinskih inženjera, Vol. 50 No. 7 pp 401-408, Zagreb 1998.<br>3. Heuze, F., Archuleta, R., Bonilla, F., Day, S. Doroudian, M., Elgamal, A., Hoehler, M., Lai, T., Lavallee, D., Lawrence, B., Liu, P-C., Martin, A., Matesic, L., Minster, B., Mellors, R., Oglesby, D., Park, S., Riemer, M., Steidl, J., Vernon, F., Vucetic, M., Wagoner, J., Yang, Z., (2004), Estimating Site-Specific Strong Earthquake Motions, Soil Dynamics and Earthquake Engineering Journal, Vol. 24, April 2004, 199-223<br>4. Matesic, L. i Vucetic, M. (2003): Strain-Rate Effect on Soil Secant Shear Modulus at Small Cyclic Strains, ASCE Journal of Geotechnical and Geoenvironmental Engineering, Vol. 129, No. 6, June 2003. pp. 536-549 |
|---|---|

| List of publications which serve as a proof of teaching qualifications | 1. Kvasnicka,P. i Matesic,L. (2001), Geotechnical data base for the City of Zagreb and its application in site response analysis, Fourth International Conference On Recent Advances In Geotechnical Earthquake Engineering And Soil Dynamics, ožujak 26-31, 2001 San Diego, CA<br>2. Matešić, L., (2002), Normalizirano ponašanje tla pri smicanju od vrlo malih deformacija do sloma, Disertacija, Građevinski fakultet Sveučilišta u Zagrebu, Zagreb 2002.<br>3. Matesic, L. i Vucetic, M. (2003): Strain-Rate Effect on Soil Secant Shear Modulus at Small Cyclic Strains, ASCE Journal of Geotechnical and Geoenvironmental Engineering, Vol. 129, No. 6, June 2003. pp. 536-549<br>4. Kvasnička, P., Kovačević Zelić, B., Znidarčić, D., Matešić, L. and Kavur, B. (2003): A case history of large strain consolidation, 13th European Conference on Soil Mechanics and Geotechnical Engineering, August 25 – 28 2003, Prag, Czech, Proceedings Vol. 1 pp 777-782<br>5. Matešić, L., Kvasnčka, P. i Vugrinec, R., (2003), A case history of consolidation of the Botonega Dam,  3rd International Conference and Exhibition HYDRO 2003, 3⬜6 November 2003, Cavtat, Croatia |
|---|---|

| Leader of the following research projects | |
|---|---|

| Participant in the following research projects | **Croatia**<br>195999  "*Mineralni brtveni slojevi za odlagališta otpada*",<br>082003  "*Poduporne konstrukcije u tlu: nove tehnologije u analizi i projektiranju*"<br>Leo Matešić: Assessment, reduction and management of geologic hazard in the Kvarner region (znanstveni scientific  project MZOS No. 114-0822695-2568; project leader Čedomir Benac)<br>Leo Matešić: Development of system of management of geotechnical data to assess natural hazards (scientific  project MZOS No. 195-1951825-1507; project leader Predrag Kvasnička, Faculty of mining and geology of the University of Zagreb)<br>**USA** |
|---|---|

|  | "*Estimation of the Ground Motion Exposure from Large Earthquakes at Four UC Campuses in Southern California*": Lawrence Livermore National Laboratory (LLNL) i četri UC kampusa - Los Angeles (UCLA), Riverside (UCR), San Diego (UCSD) and Santa Barbara (UCSB), "*G2 - Dynamic and Cylic Behaviour of Natural Menmade Soils Due to Large Near-Field Pulse*" : Pacific Earthquake Engineering Research Center . |
|---|---|

| **Supervision of MSc theses** | 0 |
|---|---|

| **Supervision of PhD theses** | 0 |
|---|---|

| **Examination of MSc theses** | 0 |
|---|---|

| **Examination of PhD theses** | 0 |
|---|---|

| Name of teacher: | Darko Meštrović |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br> 2003 |
|---|---|

| Title:<br>Since:<br>In: | Assistant Professor<br>07.06.2000<br>Structural Engineering |
|---|---|

| e-mail address, web page | dmestrovic@grad.hr |
|---|---|

| Knowledge of foreign languages: | English, French |
|---|---|

| Qualifications | - **date of birth, nationality:** 28.07.1953., Republic of Croatia<br>- **First degree obtained at:** University of Zagreb, Department of Civil Engineering<br>- **Master degre obtained at:** University of Zagreb, Department of Civil Engineering, 1987<br>- **Ph.D. degree obtained at:** University of Zagreb, Department of Civil Engineering, 1996<br>- additional education:<br>- previous employments: |
|---|---|

| List of papers published in scientific journals | Ožbolt, J.; Meštrović, D.; Li, Y.-J.; Eligehausen, R.: Compression Failure of Beams Made of Different Concrete Types and Sizes, Journal of structural engineering, ASCE, Volume 126 (2000) Number 2, 200-209.<br>Ožbolt, J.; Meštrović, D.; Eligehausen, R.: Druckversagen bei hochbewehrten Biegebalken, Bauingenieur Band 75(2000) Heft 2, 96-102.<br>Radić, Jure; Meštrović, Darko: Parametri za izbor modela vozila u dinamičkoj analizi mostova, Građevinar 40 (1988)3, str. 99-110.<br>Štimac, I., Meštrović, D., Kožar, I.: Analysis of bridge structures excited by moveable load, Građevinar 56, 2004., page 347-353. |
|---|---|

| List of publications which serve as a proof of teaching qualifications | A. Nizic, D. Meštrović, J. Radić: Seismic Protection of Bridges, Proceedings of the 18th Australasian Conference on the Mechanics of Structures and Materials, Swets & Zeitlinger Publishers, Perth, Western Australia, 2004., pp. 493-498.<br>Radić, Jure; Meštrović, Darko: Dinamički faktor i dinamička analiza grednih cestovnih mostova, Ceste i mostovi 34(1988)1, str. 15-23. (Izvorni znanstveni rad).<br>Radić, Jure; Meštrović, Darko: Parametri za izbor modela vozila u dinamičkoj analizi mostova, Građevinar 40(1988)3, str. 99-110. (Izvorni znanstveni rad).<br>Meštrović, Darko; Radić, Jure: Dinamička analiza drvenih mostova metodom konačnih elemenata, Zbornik radova simpozija Suvremene građevinske konstrukcije, seminar Drvene konstrukcije danas, DGKH, str. 392-410., Brijunski otoci, 1987. (Prethodno priopćenje)<br>Štimac, I., Meštrović, D., Kožar, I.: Analysis of bridge structures excited by moveable load, Građevinar 56, 2004., page 347-353 |
|---|---|

| Leader of the following research projects | |
|---|---|

| Participant in the following research projects | Projekt 2-11-1990. Modeliranje postojanosti mostova (project leader Jure Radić)<br>Projekt Z-116-13 Modeliranje trajnosti lučnih mostova (project leader Jure Radić) |
|---|---|

| Supervision of MSc theses | 2 |
|---|---|

| **Supervision of PhD theses** | |
| --- | --- |

| **Examination of MSc theses** | 2 |
| --- | --- |

| **Examination of PhD theses** | |
| --- | --- |

| Name of teacher: | NEVENKA OŽANIĆ |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br>01.04.2000 |
|---|---|

| Title:<br>Since:<br>In: | Associate Professor<br>11.06.2002<br>Hydraulic Engineering |
|---|---|

| e-mail address, web page | nozanic@gradri.hr; www.gradri.hr |
|---|---|

| Knowledge of foreign languages: | English, Italian |
|---|---|

| Qualifications | **- date of birth, nationality:** 20.04.1963, Republic of Croatia<br>**- First degree obtained at:** University of Rijeka, Department of Civil Engineering<br>**- Master degre obtained at:** University of Zagreb, Department of Civil Engineering<br>**- Ph.D. degree obtained at:** University of Split, Department of Civil Engineering<br>**- additional education:**<br>**- previous employments:** - 1986-2000:Hrvatske vode VGO Rijeka |
|---|---|

| List of papers published in scientific journals | 1. **Ožanić, Nevenka**; Rubinić, Josip.; The Regime of Inflow and Runoff from Vrana Lake and the Risk of Permanent Water Pollution // *RMZ-Material and Geoenvironment*. 50 (2003)  281-5.<br>2. Benac, Čedomir; Rubinić, Josip; **Ožanić, Nevenka**.;The Origine and Evolution of Coastal and Submarine Springs in Bakar bay. // *Acta Carstologica*. 32 (2003) , 1; 157-171.<br>3. Rubinić, Josip; **Ožanić, Nevenka**. Stochastic modelling of accumulation behaviour on the example of accumulation with losses //*Proceedings of the 4th International Conference on Calibration and Reliability in Groundwater Modelling* / K. Kovar (ur.) Praha 2002; Acta Universitatis Carolinae – Geologica. 180-182.<br>4. Gereš, D., Rubinić, J., **Ožanić, N**. 2000. *Ecological incidents in Northern Adriatic Karst (Croatia).* Water Science and Technology 42/1-2, IWA Publising 2000, 281.-285.<br>5. **Ožanić, N.** i Rubinić, J. 1997. *Analysis of   the Appearance of Extremely Low Water Levels of the Vrana Lake on Cres Island (Croatia).* Loc procceding FRIEND'97, Postojna 1.-4.10.1997., Acta Hydrotehnica 15/19.: 75-81.<br>6. Rubinić, J., Gereš, D., Hrvojić, E. i **Ožanić, N**. 1997. *Regional Hydrological Analysis and Management of Water Resources of the Istrian Peninsula - Croatia.* Loc procceding FRIEND'97, Postojna 1.-4.10.1997., Acta Hydrotehnica 15/19.: 155-157.<br>7. Karleuša, Barbara; Beraković, Boris; **Ožanić, Nevenka**. Primjena ELECTRE TRI metode na izbor varijante navodnjavanja. *GRAĐEVINAR*. 57 (2005) , 1; 21-28.<br>8. Rubinić, J. i **Ožanić, N**. 1998. *Hidrologija akumulacije Ponikve na otoku Krku.* Građevinar 50(1998)2: 81-89.<br>9. Rubinić, J. i **Ožanić, N**. 1992. *Hidrološke karakteristike Vranskog jezera na otoku Cresu*. Građevinar 44(8): 521-530.<br>10**.** Gereš, D**., Ožanić, N.,** Rubinić, J. (2000): *Odnos razvoja poljoprivrede i šumarstva i vodnih resursa u kršu.* Hrvatske vode 8(33), 313 – 319.<br>11. **Ožanić, N.** i Rubinić, J. 1994. *Analiza hidrološkog režima Vranskog jezera na otoku Cresu.* Hrvatske vode 8(2): 535-543. |
|---|---|

| List of publications which serve as a proof of teaching qualifications | 1**. Ožanić, Nevenka** i sur. Priručnik za hidrotehničke melioracije, III kolo, Knjiga I, Suvremeni pristupi i metode planiranja i upravljanja hidromelioracijskim sustavima **/** Ožanić, Nevenka (ur.). Rijeka : Građevinski fakultet Sveučilišta u Rijeci, 2003.<br><br>2. **Ožanić, Nevenka**. Hidrogrami velikih vodnih valova Priručnik za hidrotehničke melioracije, III kolo, Knjiga I, Suvremeni pristupi i metode planiranja i upravljanja hidromelioracijskim sustavima/ Ožanić, Nevenka (ur.). Rijeka : Građevinski fakultet Sveučilišta u Rijeci, 2003.<br><br>3. **Ožanić, Nevenka** i sur. Priručnik za hidrotehničke melioracije, III kolo, Knjiga II, Elementi planiranja hidromelioracijskih sustava/ Ožanić, Nevenka (ur.). Rijeka : Građevinski fakultet Sveučilišta u Rijeci, 2005.<br>4. **Ožanić, Nevenka**. Statističke obrade velikih voda hidromelioracijskih sustava //Priručnik za hidrotehničke melioracije, III kolo, Knjiga II, Elementi planiranja hidromelioracijskih sustava/ Ožanić, Nevenka (ur.). Rijeka : Građevinski fakultet Sveučilišta u Rijeci, 2005. |
|---|---|

5. **Ožanić, Nevenka**; Rubinić, Josip.; The Regime of Inflow and Runoff from Vrana Lake and the Risk of Permanent Water Pollution // *RMZ-Material and Geoenvironment*. 50 (2003) 281-5.

6. Benac, Čedomir; Rubinić, Josip; **Ožanić, Nevenka**.;The Origine and Evolution of Coastal and Submarine Springs in Bakar bay. // *Acta Carstologica*. 32 (2003) , 1; 157-171.

7. Rubinić, Josip; **Ožanić, Nevenka**. Stochastic modelling of accumulation behaviour on the example of accumulation with losses //*Proceedings of the 4th International Conference on Calibration and Reliability in Groundwater Modelling* / K. Kovar (ur.) Praha 2002; Acta Universitatis Carolinae – Geologica. 180-182.

8. Gereš, D., Rubinić, J., **Ožanić, N**. 2000. *Ecological incidents in Northern Adriatic Karst (Croatia).* Water Science and Technology 42/1-2, IWA Publising 2000, 281.-285.

9. **Ožanić, N.** i Rubinić, J. 1997. *Analysis of the Appearance of Extremely Low Water Levels of the Vrana Lake on Cres Island (Croatia).* Loc procceding FRIEND'97, Postojna 1.-4.10.1997., Acta Hydrotehnica 15/19.: 75-81.

10. Rubinić, J., Gereš, D., Hrvojić, E. i **Ožanić, N**. 1997. *Regional Hydrological Analysis and Management of Water Resources of the Istrian Peninsula - Croatia.* Loc procceding FRIEND'97, Postojna 1.-4.10.1997., Acta Hydrotehnica 15/19.: 155-157.

11. Karleuša, Barbara; Beraković, Boris; **Ožanić, Nevenka**. Primjena ELECTRE TRI metode na izbor varijante navodnjavanja. *GRAĐEVINAR*. 57 (2005) , 1; 21-28.

12. **Ožanić, Nevenka**; Rubinić, Josip.; The Regime of Inflow and Runoff from Vrana Lake and the Risk of Permanent Water Pollution // *RMZ-Material and Geoenvironment*. 50 (2003) 281-5.

13. Benac, Čedomir; Rubinić, Josip; **Ožanić, Nevenka**.;The Origine and Evolution of Coastal and Submarine Springs in Bakar bay. // *Acta Carstologica*. 32 (2003) , 1; 157-171.

14. Rubinić, Josip; **Ožanić, Nevenka**. Stochastic modelling of accumulation behaviour on the example of accumulation with losses //*Proceedings of the 4th International Conference on Calibration and Reliability in Groundwater Modelling* / K. Kovar (ur.) Praha 2002; Acta Universitatis Carolinae – Geologica. 180-182.

15. Gereš, D., Rubinić, J., **Ožanić, N**. 2000. *Ecological incidents in Northern Adriatic Karst (Croatia).* Water Science and Technology 42/1-2, IWA Publising 2000, 281.-285.

16. **Ožanić, Nevenka**; Rubinić, Josip; Karleuša, Barbara; Holjević, Danko. The Revitalisation of Curtural Hereditary Buildings in Water Streams // Proceedings of 3rd ECRR International Conference on River Restoration in Europe / Gereš, Dragutin (ur.). Zagreb : Hrvatske vode, 2004. 263-271.

17. Karleuša, Barbara; Beraković, Boris; **Ožanić, Nevenka**. Multi-criteria Optimization Methods in Water Management // Proceedings of the VIII. International Symposium on Water Management and Hydraulic Engineering / Šoltesz, Andrej (ur.). Bratislava : Faculty of Civil Engineering, Slovak University of Technology in Bratislava, 2003. 177-185.

18. Kos, Zorko; **Ožanić, Nevenka**. Water Resources in Croatia in the 21st Century // Proceedings of VIII. International symposium on Water management and hydraulic engineering / D. Petraš (ur.). Podbanske : Faculty of Civil Engineering Slovak University of Technology in Bratislava, Slovakia, 2003. 195-200

19. **Ožanić, Nevenka**; Deluka-Tibljaš, Aleksandra; Karleuša, Barbara. Croatian Experience in Exploitation of Hydrological Calculations in a Road Design Practise // VIII. International Symposium on Water Management and Hydraulic Engineering Proceedings / Šoltesz, Andrej (ur.). Bratislava : Faculty of Civil Engineering, Slovak University of Technology in Bratislava, 2003. 305-312

20. **Ožanić**, Nevenka; Rubinić, Josip. The Regime of Inflow and Runoff from Vrana Lake and the Risk of Permanent Water Pollution // Groundwater in Geological Engineering, Proceedings / Jože Pezdič (ur.).

Ljubljana : Faculty of Natural Science and Technology, Ljubljana and the Institute for Mining, Geotechnology and Enviroment Ljubljana, 2003. 281-284

21. **Ožanić, Nevenka**; Rubinić, Josip. Hydrological Bases of Regional Management of Water Reserves in the High Karst as Examplified by the Upper Part of the Kupa River Catchment Area // Proc. 21st Conference of the Danubian Countries-CD / Florian Stadin (ur.). Bucharest : Romanian National Committee for the International Hydrological P, 2002. 117-124

22. Rubinić, J., **Ožanić, N**. (2002.) *Stochastic modelling of accumulation behaviour on the example of accumulation with losses.* Proceedings of the 4th International Conference on Calibration and Reliability in Groundwater Modelling, Prague, Czech Republic, 17-20.06.2002.

23. Gereš, Dragutin; **Ožanić, Nevenka**; Rubinić, Josip. Water resources management planning in Croatia // Water management and hydraulic engineering / Bednarczyk, Stefan ; Szymkiewicz, Romulad ; Suligowski Ziemovit (ur.). Gdansk, Poland : Faculty of Hydro and Environmental Engineering, Technical Unive, 2001. 141 - 148

24. Gereš, D.; Rubinić, Josip; **Ožanić, Nevenka**. Groundwater management in the karstic ones in Croatia // Proceedings of the 3rd International Conference on Future Groundwater Resources at Risk / Ribeiro, Luis

| | (ur.). Lisbon : GeoSystems center, 2001. 487-494 |
|---|---|
| | 25. **Ožanić, Nevenka**; Rubinić, Josip. Hidraulic Limitation of Exploitation Vrana Lake for Water Supply (Croatia) // Proceedings of the XXIX IAHR Congress - 21st Century: The New Era for Hydraulic Research and its Applications / Jolien, Mans (ur.). Peking : IAHR, 2001. 100-106 |
| | 26. **Ožanić, N.**, Rubinić, J. (2001.) *Reception of Flood Waves in Storage Reservoirs on Small Watercourses – Example of Hidrological Analysis for the Storage Reservoir Križ*. Proceedings of the Conference Hydro 2001 – Opportunities and Callenges, Riva del Garda, Italia, 27-29.09.2001.<br>27. **Ožanić, N.**, Rubinić, J. (2001.)*Hidraulic Limitation of Exploitation Vrana Lake for Water Supply (Croatia)*, Proceedings of the XXIX IAHR Congress - 21st Century: The New Era for Hydraulic Research and its Applications, Peking, Kina, 16-21.10.2001. |

| **Leader of the following research projects** | Znanstvene osnove za razvoj natapanja u Republici Hrvatskoj – 2000.-<br>Nevenka Ožanić: Hydrology of sensitive water resources in karst (scientific  project MZOS No. 114-0982709-2549) |
|---|---|

| **Participant in the following research projects** | »**Protuerozijske zaštite tla i voda u Istri u sklopu šire ekološke problematike zaštite Jadrana – pilot objekat višenamjenska površinska akumulacija i sliv Botonege u flišnom području srednje Istre**« (1993.-1996.)<br>«**Hidrološko-hidrogeološko-geološke analize bilance voda u kršu**» (za 1999.-2001.)<br>«**Impact of land use change on hydrological, ecological and river morphology processes in the Dragonja catchment**»  (2002.-2003)<br>«**Hidroekološka istraživanja sustava krških ponornica i vodonosnika**» (2003-2004).<br>«Istraživanje utjecaja epikrške zone na dinamiku istjecanja krških izvora»  (2005/2006). |
|---|---|

| **Supervision of MSc theses** | 0 |
|---|---|

| **Supervision of PhD theses** | 0 |
|---|---|

| **Examination of MSc theses** | 5 |
|---|---|

| **Examination of PhD theses** | 2 |
|---|---|

| Name of teacher: | Joško Ožbolt |
|---|---|

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br>2002 |
|---|---|

| Title:<br>Since:<br>In: | Full Professor<br>2004<br>Engineering Mechanics |
|---|---|

| e-mail address, web page | josko.ozbolt@gradri.hr |
|---|---|

| Knowledge of foreign languages: | English, German |
|---|---|

| Qualifications | **- date of birth, nationality:** 23.04.1955, Republic of Croatia<br>**- First degree obtained at:** University of Zagreb, Department of Civil Engineering<br>**- Master degre obtained at:**<br>**- Ph.D. degree obtained at:** University of Zagreb, Department of Civil Engineering<br>**- additional education:** 1980-1981: TNO Institut, Rijswijk-Delft, Holland<br>1987, 1988, 1989 i 1991: Northwestern University, Evanston, USA (Prof. Z.P. Bažant)<br>**- previous employments:** 1978-1982: Teaching Assistant, University of Zagreb, Department of Civil Engineering; 1983-1997: Associate Professor, University of Zagreb, Department of Civil Engineering; 1998: Full Professor, University of Zagreb, Department of Civil Engineering |
|---|---|

| List of papers published in scientific journals | <ul><li>Ožbolt, J. and Bažant, Z. P. (1992). "Microplane Model for Cyclic Triaxial Behavior of Concrete," *Journal of Eng. Mech., ASCE*, 118, (7), 1365--1386.</li><li>Ožbolt, J. and Bažant, Z.P. (1996). "Numerical Smeared Fracture Analysis: Nonlocal Microcrack Interaction Approach," *International Journal for Numerical Methods in Engineering*, 39(4), 635-661.</li><li>Ožbolt, J., Eligehausen, R. and Reinhardt, H.W. (1999). "Size effect on the concrete cone pull-out load." *International Journal of Fracture*, 95 (1999), 391-404.</li><li>Ožbolt J., Mayer, U., Vocke H., und Eligehausen R. (1999). "Vreschmierte Rißmethode - Theorie und Anwendung." *Beton- und Stahlbetonbau*, 94, Heft 10, 403-412.</li><li>Ožbolt, J., Mestrović, D., Li, Y.-J., and Eligehausen, R. (2000). "Compression failure - beams made of different concrete types and sizes."*Journal of Structural Engeneering*, ASCE, Vol. 126, No. 2, December 2-4.</li><li>Ožbolt, J., Li, Y.-J and Kožar, I. (2001). "Microplane model for concrete with relaxed kinematic constraint." *International Journal of Solids ands Structures*, 38, 2683-2711.</li><li>Li, Y., Eligehausen, R., Ožbolt, J. and Lehr, B. (2002). „Numerical Analysis of Quadruple Fastenings with Bonded Anchors." *ACI Structural Journal*, V.99, No. 2, 149-156.</li><li>Pivonka, P., Ožbolt, J., Lackner, R. and Mang, H.A. (2003). „Comparative studies of 3D-constitutive models for concrete: application to mixed-mode fracture." *International Journal for Numerical Methods in Engineering*, 60:549-570.</li><li>Ožbolt, J. and Reinhardt, H.W. (2003). "Numerical study of mixed mode fracture in concrete." *International Journal of Fracture*, 118: 145-161.</li><li>Bossert, J., Ožbolt, J. and Grassegger, G. (2004). "Finite-Element Modeling of the Conservation Effects of an Artificial Resin on Deteriorated Heterogeneous Sandstone in Building Restoration." *Environmental Geology*, Vol. 46, Isuse 3, 306-313.</li><li>Ožbolt, J., Kožar, I., Eligehausen, R., and Periškić, G., (2005). "Instationäres 3D Thermo-mechanisches Modell für Beton," *Beton und Stahlbetonbau,* (0005-9900) **100** (2005),1; 39-51.</li></ul> |
|---|---|

| List of publications which serve as a | <ul><li>German habilitation</li><li>Lectures at Civil Engineering Departments in Rijeka, Zagreb and Stuttgart during the last 20</li></ul> |
|---|---|

| proof of teaching qualifications | years |
|---|---|
| | • Numerous presentations at conferences and seminars during the last 20 years (4-5 per year on average) |
| | • Construction |
| | 1 Non-linear analysis of a pedestrian suspension bridge over a motorway near Munich (1984) |
| | 2 Numerical analysis of a phase in the construction of the bridge over the river of Riječina near Rijeka (1986) |
| | 3 Reconstruction design of a swimming pool in Split (1986) |
| | 4 Numerical analysis of the sport hall CIBONA (dome structure) in Zagreb (1987). |
| | • Computer software |
| | 1 SPAN, |
| | 2 NELIN2, |
| | 3 NELIN3 |
| | 4 MASA |
| | 5 ANCHOR |

| Leader of the following research projects | - **DFG research project: "Numerische Modellierung von Beton unter cyklischer Beanspruchung", Universität Stuttgart, 1989-1992** |
|---|---|
| | - DFG research project: "Maßstabseffekt und Duktilität von Beton- und Stahlbetonkonstruktionen", Universität Stuttgart, 1992-1996 |
| | - DIBt project: "Das Verhalten von Kopfbolzenbefestigungen unter Zug- und Querbeanspruchungen", Universität Stuttgart, 1995-2000 |
| | - DIBt project: "Das Verhalten von Beton unter Brandbeanspruchung", Universität Stuttgart, 1992-2000 |
| | - Joško Ožbolt: Numerical 3D chemo-hygro-thermo-mechanical model of concrete (scientific project MZOS No. 114-0000000-3145) |

| Participant in the following research projects | - research project with Germany, Instütut für Werkstoffe im Bauwesen, Universität Stuttgart: "Erstellung eines 3D FE Programms für die Ermittlung der Temperatur- und Feuchteverteilung", 2003 |
|---|---|
| | - research project 0114002: "Numeričko modeliranjue kvazi-krtih materijala", 2002-2004 |
| | - research project 114102: "Numerička analiza kvazi-krtih materijala", 1997-2001. |
| | - Joško Ožbolt: Flexible long structures: non-linear modelling with visulaization (scientific project MZOS No. 114-0982562-1460; project leader Ivica Kožar) |

| **Supervision of MSc theses** | 3 |
|---|---|

| **Supervision of PhD theses** | 3 |
|---|---|

| **Examination of MSc theses** | 6 |
|---|---|

| **Examination of PhD theses** | 6 |
|---|---|

| Name of teacher: | Boris Podobnik |
|---|---|

| Employed at: Since: | University of Rijeka, Department of Civil Engineering |
|---|---|

| Title: Since: In: | Assistant Professor 1.10.2002. Physics |
|---|---|

| e-mail address, web page | bp@phy.hr, www.gradri.hr/~bp, www.phy.hr/~bp |
|---|---|
| Knowledge of foreign languages: | English, Slovenian |

| Qualifications | - date of birth, nationality: 8.3.1964, Rogoznica, Republic of Croatia<br>- First degree obtained at: PMF, 1989<br>- Master degre obtained at: PMF, 1993<br>- Ph.D. degree obtained at: PMF, 1996<br>- additional education:<br>- previous employments: PMF, 1989-2002 |
|---|---|

| List of papers published in scientific journals | B. Podobnik, P. Ring and D. Vretenar, Relativistic mean-field description of collective motion in nuclei: the pion field, *Z. Phys. A354* (1996) 375<br><br>P. Ring, D. Vretenar and B. Podobnik, Double giant resonances in time-dependent relativistic mean-field theory, *Nucl. Phys. A598* (1996) 107<br><br>D. Horvat, B. Podobnik and D. Tadic, Chiral quark model in a Tamm-Dancoff inspired approximation, *Phys. Rev. D58* 034003 (1998)<br><br>D. Horvat, B. Podobnik and D. Tadic, Nucleon static properties in a Tamm-Dancoff inspired approximation, *Fizika B7* (1998) 3, 127<br><br>B. Podobnik,et al, Systems with correlations in the variance: Generating power-law tails in probability distributions, "Europhys. Lett. 50, (2000) 711<br><br>B. Podobnik,et al, Scale-invariant truncated Levy flight,"Europhys. Lett. 52, (2000) 491<br><br>B. Podobnik, et al, Time evolution of stochastic processes with correlations in the variance: stability in power-law tails of distributions, *Physica A 300, 300-309 (2001)*<br><br>P.Ch. Ivanov, B. Podobnik and H. E. Stanley, Truncated Levy process with scale-invariant behavior, Physica A 299, 154-160 (2001).<br><br>B. Podobnik, et al, Stochastic processes with power-law stability and the crossover in power-law correlations, *Physica A 316, 153 (2002)*<br><br>D. Klabucar, K. Kumericki, D. Mekterovic, and B. Podobnik, On the instanton--induced portion of the nucleon strangeness II: the MIT model beyond the linearized approximation, *Eur.Phys.J. C 29, 71-78 (2003)*<br><br>P. Ch. Ivanov, A. Yuen, B. Podobnik, Y. Lee, Common scaling patterns in intratrade times of U.S. Stocks, *Phys. Rev. E 69, 056107 (2004)*<br><br>B. Podobnik, I. Grosse, P.Ch. Ivanov, K. Matia and H. E. Stanley, ARCH-GARCH approaches to modeling high-frequency financial data, Physica A 344 (1-2): 216-220 (2004).<br><br>B. Podobnik, P. Ch. Ivanov, V. Jazbinsek, Z. Trontelj, H. E. Stanley, and I. Grosse, Power-law correlated processes with asymmetric distributions, *Phys. Rev. E 71 (2) 025104(R) (2005)*<br>T. Jagric, M. Kolanovic, and B. Podobnik, Does the Efficient Market Hypothesis Hold? Evidence from Six Transition Economies, *to be published in Eastern European Economics (2005).* |
|---|---|

| List of publications | B. Podobnik,et al, Systems with correlations in the variance: Generating power-law tails in probability distributions, "Europhys. Lett. 50, (2000) 711 |
|---|---|

| which serve as a proof of teaching qualifications | B. Podobnik,et al, Scale-invariant truncated Levy flight,"Europhys. Lett. 52, (2000) 491 |
|---|---|
| | B. Podobnik, et al, Time evolution of stochastic processes with correlations in the variance: stability in power-law tails of distributions, Physica A 300, 300-309 (2001) |
| | P.Ch. Ivanov, B. Podobnik and H. E. Stanley, Truncated Levy process with scale-invariant behavior, Physica A 299, 154-160 (2001). |
| | B. Podobnik, et al, Stochastic processes with power-law stability and the crossover in power-law correlations, Physica A 316, 153 (2002). |
| | P. Ch. Ivanov, A. Yuen, B. Podobnik, Y. Lee, Common scaling patterns in intratrade times of U.S. Stocks, Phys. Rev. E 69, 056107 (2004). |
| | B. Podobnik, I. Grosse, P.Ch. Ivanov, K. Matia and H. E. Stanley, ARCH-GARCH approaches to modeling high-frequency financial data, Physica A 344 (1-2): 216-220 (2004). |
| | B. Podobnik, P. Ch. Ivanov, V. Jazbinsek, Z. Trontelj, H. E. Stanley, and I. Grosse, Power-law correlated processes with asymmetric distributions, Phys. Rev. E 71 (2) 025104(R) (2005). |
| | T. Jagric, M. Kolanovic, and B. Podobnik, Does the Efficient Market Hypothesis Hold? Evidence from Six Transition Economies, to be published in Eastern European Economics (2005). |

| Leader of the following research projects | 1. Joint Croatian-Slovenian collaboration on research of heart dynamics<br>2. Boris Podobnik: Investigation of correlations and stochastic modelling at the cell level (scientific project MZOS No. 114-0352827-1370) |
|---|---|

| Participant in the following research projects | |
|---|---|

| Supervision of MSc theses | |
|---|---|

| Supervision of PhD theses | |
|---|---|

| Examination of MSc theses | |
|---|---|

| Examination of PhD theses | |
|---|---|

| Name of teacher: | Nenad Ravlić |
|---|---|

| Employed at: | IGH d.d. PC Rijeka |
|---|---|
| Since: | 1.12.1987 |

| Title: | Assistant Professor |
|---|---|
| Since: | |
| In: | Hydraulic engineering |

| e-mail address, web page | nenad.ravlic@igh.hr |
|---|---|

| Knowledge of foreign languages: | English, Italian |
|---|---|

| Qualifications | **- date of birth, nationality:** 29.08.1963, Republic of Croatia<br>**- First degree obtained at:** University of Rijeka, Department of Civil Engineering<br>**- Master degre obtained at:**<br>**- Ph.D. degree obtained at:** Universita' degli Studi di Padova<br>**- additional education:** 1993. godine, specialisation in advanced treatment of drinking and waste water "Culligan Italiana S.p.A., Bologna, Italy<br><br>**- previous employments:**<br>    1.12.1987. - 14.01.1988. GPZ Rijeka, 15.01.1988. - 30.06.1991. GI OOUR FGZ Rijeka, 1.07.1991. 30.09.1993. University of Rijeka, Department of Civil Engineering |
|---|---|

| List of papers published in scientific journals | 1. Ravlić, N., Utjecaj plitkog podmorskog grebena na turbulentno miješanje u jadranskim priobalnim kanalima, članak recenziran i prihvaćen za objavljivanje u jednom od skorijih izdanja časopisa "Građevinar"<br><br>2. Ravlić, N., Enhancement of mixing processes in semi-deep coastal channels by a bathymetry change, *Proc. of the Fourth International Symposium on Environmental Hydraulics*, Hong Kong, China, 2004 (u tisku).<br><br>3. Ravlić, N. et al., Stobrec Outfall – Successful Application of Long Length HDPE Pipe Concept, *Proc. of the 3rd Int. Conf. On Marine Waste Water Discharges 2004.* ed. C. Avanzini, Catania, str. T13, 1-9, 2004<br><br>4. Johansen, O. Ravlić, N. et al., Šibenik Outfall Project – Installation Design Optimisation, *Proc. of the 3rd Int. Conf. On Marine Waste Water Discharges 2004.* ed. C. Avanzini, Catania, str. T14, 1-11, 2004<br><br>5. Ravlić, N., Čatlak, Z., Split/Solin Sewerage System – Od ideje do realizacije, *Gradevinar 55(2004)4,* str. 191-197<br><br>6. Ravlić, N., Optimizacija projekta prve etape kanalizacijskog sustava Split/Solin, *Građevinar 55(2003)12,* 713-722<br><br>7. Ravlic, N., Gjetvaj, G., Modelling of Stratified Flow Over Topography in Semi-Deep Coastal Channels, *Proc. of the Seventh International Conference on Water Pollution 2003*, ed. C.A. Brebbia, WIT Press: Southampton, Boston, str. 487-496, 2003.<br><br>8. Gjetvaj G., Ravlić N., Effluent Plume Modelling in Coastal Waters – Mathematical vs. Hydraulic Model, *Proc. of the 2nd Int. Conf. On Marine Waste Water Discharges 2002.* ed. C. Avanzini, Istanbul, str. 1-8, 2002.<br><br>9. Ravlić, N., Impact of Bottom Topography on Split Outfall Discharge Zone Hydrodynamics, *Proc. of the Third International Symposium on Environmental Hydraulics*, Tempe, Arizona, str. 17-22, 2001.<br><br>10. Ravlić, N., Gjetvaj, G., Andročec, V., Split Submarine Outfall Impact Assessment and Pollutant Transport Modelling, *Proc. of the Sixth International Conference on Water Pollution 2001*, ed. C.A. Brebbia, WIT Press: Southampton, Boston, str. 249-258, 2001. |
|---|---|

11. Ravlić, N., Mathematical Modelling of Poreč Water Suppy System, *Proc. of the International Symposium on Water Management and Hydraulic Engineering*, ed. M.Szydlowski, Gdansk, str. 405-410, 2001.

12. Ravlić, N., To Pump or to Excavate More ?, *Proc. of the International Congress on Energy and Environment XVII*, ed. B. Frankovic, Zambelli: Rijeka, str. 197-205, 2000.

13. Ravlić, N., Optimisation of Split/Solin sewerage system. *Proc. of the 3rd Int. Conf. On Environmental Coastal Regions III*, eds. G.R. Rodriguez, C.A. Brebbia, E.Perez-Martell, WIT Press: Southampton, Boston, str. 343-352, 2000.

14. Ravlić, N., Optimization of Split/Solin submarine outfall length. *Proc. of the Int. Conf. On Marine Waste Water Discharges 2000.* eds. C. Avanzini, N. Bazzurro, AMGA, Genova, str. 187-196, 2000.

15. Ravlić, N., Role of Urban Drainage Systems in Environmental Protection, *Proc. of the International Congress on Energy and Environment XVI*, ed. B. Frankovic, Zambelli: Rijeka, str. 251-258, 1998.

16. Ravlić, N., Modelling of Mixing Processes in Stratified Sea-Water Aquatic Environment. *Proc. of the International Symposium on Water Management and Hydraulic Engineering*, eds. J. Petras, D. Malus, MTG topgraf: Velika Gorica, str. 285-297, 1998.

17. Ravlić N.: Simulacija rasprostiranja otpadne vode ispuštene putem podmorskih difuzorskih ispusta u Riječki zaljev, *Zbornik stručnog savjetovanja grupacije javnih vodovoda i kanalizacija RH*, Opatija, 1997.

18. Ravlić N.: Submarine Outfall Study in the Rijeka Bay, *Proceedings of the 2nd DHI Software User Conference*, Helsingor, 1997.

19. Ravlić N.,Čunko R.: Informatička podrška upravljanju priobalnim morem - koncept i implementacija, *Pomorski zbornik br. 35/1997*, str. 277-295.

20. Ravlić N.: Modellazione numerica dei processi idrodinamici nei bacini costieri di media profondita' in presenza dell'effetto baroclinico, *doktorska disertacija*, Padova, Italija, 1996.

21. Ravlić N.: A New Approach to Aquatic Environment Management as One Segment of Spatial Planning in Coastal Regions, *Proceedings of an International Expert Meeting on Integrated Coastal Area Management in the Mediterranean/Adriatic*, Ljubljana, 1995., str. 132-142.

22. Ravlić N., Bošković D., Deduš B.*:* Turizam i informacijski sustavi za podržavanje upravljanja akvatorijem, *Zbornik XIV kongresa i znanstvenog simpozija "Razvojni problemi turizma hrvatskog Jadrana"*, Dubrovnik, 1995., str. 319-326

23. Ravlić N., Bošković D., Deduš B.: Planiranje i upravljanje akvatorijem Riječkog zaljeva, *Zbornik I Hrvatske konferencije o vodama*, Dubrovnik 1995., str. 179-187.

24. Ravlić D., Plišić I., Ravlić N: Ispitivanja na kanalizacijskom sustavu industrijske zone Škrljevo-Kukuljanovo, *Zbornik fakulteta X*, Građevinski fakultet Sveučilišta u Rijeci, 1994, str. 25-39

25. Ravlić D., Plišić I., Ravlić N.: Ugroženost izvora i obalnog mora otpadnim vodama privredne zone Škrljevo-Kukuljanovo, *Pomorski zbornik 31 (1993) 1*, str. 583-604.

26. Hrešić D., Ravlić N.: Primjer razaranja nezaštićenog vertikalnog lukobrana, *Zbornik fakulteta IX*, Građevinski fakultet Sveučilišta u Rijeci, 1992, str. 10-22.

27. Ravlić D., Ravlić N., Plišić I.: Ispitivanje efikasnosti rada podmorskog ispusta Kostrena, *Zbornik fakulteta IX*, Građevinski fakultet Sveučilišta u Rijeci, 1992, str. 63-81.

28. Ravlić D., Plišić I., Ravlić N.: Reduction of Waste Water Quality Parameters on the Way of Transport through Sewerage System, *Proceedings of an International Symposium "Research on Hydraulic Engineering*, Zagreb, 1992, str. 263-274.

29. Ravlić D., Ravlić N.: *Ugroženost vodoopskrbe grada Rijeke*, Hrvatske vode 1 (1992) 2, str. 93-98.

30. Ravlić D., Ravlić N.: Značaj vrulja sa stajališta vodoopskrbe, *Pomorski zbornik 30 (1991) 1*, 1991, 679-692

31. Ravlić D., Ravlić N.: Zaštita plaža - utjecajni činitelj izbora trase jadranske autoceste, *Zbornik I Simpozija "Prometni i konstrukterski aspekti jadranske autoceste"*, Dubrovnik, 1989, str. 81-87.

|  |  |
|---|---|
|  |  |

| **List of publications which serve as a proof of teaching qualifications** | As ab* under 1,2,7,8,9,10,16,17,18,20 |
|---|---|

| **Leader of the following research projects** | "Planiranje i upravljanje u akvatoriju Riječkog zaljeva", IGH PC Rijeka, 1995-1997. |
|---|---|

| **Participant in the following research projects** | Modeliranje utjecaja zagađenja i razvoj ekspertnog sustava ekološkog sustava Riječkog zaljeva (1-99-175) |
|---|---|

| **Supervision of MSc theses** | 0 |
|---|---|

| **Supervision of PhD theses** | 0 |
|---|---|

| **Examination of MSc theses** | 0 |
|---|---|

| **Examination of PhD theses** | 0 |
|---|---|

| Name of teacher: | Zoran Ren |
|---|---|

| Employed at:<br>Since: | University of Maribor, Department of Mechanical Engineering<br>1993 |
|---|---|

| Title:<br>Since:<br>In: | Associate Professor<br>2000<br>Engineering Mechanics |
|---|---|

| e-mail address, web page | ren@uni-mb.si |
|---|---|

| Knowledge of foreign languages: | Croatian, English, German, Russian |
|---|---|

| Qualifications | - **date of birth, nationality:** 30.6.1963, Republic of Slovenia<br>- **First degree obtained at:** University of Maribor, Department of Mechanical Engineering<br>- **Master degre obtained at:** University of Maribor, Department of Mechanical Engineering<br>- **Ph.D. degree obtained at:** University College of Swansea, Department of Civil Engineering<br>- **additional education:** 1989- Berkeley Nuclear Laboratories, UK<br><ul><li>1992- University College of Swansea, UK</li><li>1996- Delft University of Technology, The Netherlands</li><li>2000-2001- Friedrich-Alexander Universität, Erlangen-Nürnberg, Germany</li></ul><br>- **previous employments:** 1990-1992- University of Wales Swansea, UK |
|---|---|

| List of papers published in scientific journals | <ul><li>GLODEŽ, Srečko, FLAŠKER, Jože, REN, Zoran. A new model for the numerical determination of pitting resistance of gear teeth flanks. *Fatigue fract. eng. mater. struct.*, 1997, vol. 20, no. 1, str.71-83. [COBISS-ID 2630422]</li><li>GLODEŽ, Srečko, REN, Zoran, FLAŠKER, Jože. Simulation of surface pitting due to contact loding. *Int. j. numer. methods eng.*, 15 September 1998, 43, št. 1, str. 33-50. [COBISS-ID 3872278]</li><li>REN, Zoran, GLODEŽ, Srečko. The use of short crack growth model for service-life estimation of pitting-prone surfaces. *Int. j. eng. model.*, 2000, vol 13, no. 3/4, str. 101-106. [COBISS.SI-ID 6778134]</li><li>REN, Zoran, GLODEŽ, Srečko, FAJDIGA, Gorazd, ULBIN, Miran. Surface initiated crack growth simulation in moving lubricated contact. *Theor. appl. fract. mech.*. [Print ed.], Sep.-Oct. 2002, vol. 38, no. 2, str. 141-149. [COBISS.SI-ID 7495446]</li><li>REN, Zoran, GLODEŽ, Srečko. Computational service life estimation of contacting mechanical elements in regrad to pitting. Comput. struct.. [Print ed.], 2002, 80, str. 2209-2216. [COBISS.SI-ID 7717398]</li><li>GLODEŽ, Srečko, ABERŠEK, Boris, FLAŠKER, Jože, REN, Zoran. Evaluation of the service life of gears in regrad to surface pitting. *Eng. fract. mech.*. [Print ed.], 2004, vol. 71, iss. 4/6, str. 429-438. [COBISS.SI-ID 8436758]</li><li>REN, Zoran, BIĆANIĆ, Nenad. Simulation of progressive fracturing under dynamic loading conditions. *Commun. numer. methods eng.*, 1997, vol. 13, str. 127-138. [COBISS-ID 2672406]</li><li>GLODEŽ, Srečko, REN, Zoran. The fatigue crack growth parameters for 20MnCr5 steel. Strojarstvo, 1998, vol. 40, no. 3/4, str. 85-88. [COBISS.SI-ID 4473110]</li><li>FAJDIGA, Gorazd, FLAŠKER, Jože, GLODEŽ, Srečko, REN, Zoran. Numerično simuliranje površinske utrujenostne razpoke na zobeh zobnikov = Numerical simulation of the surface fatigue crack growth on gear teeth flanks. Stroj. vestn., 2000, letn. 46, št. 6, str. 359-369. [COBISS.SI-ID 5693206]</li><li>ULBIN, Miran, GLODEŽ, Srečko, REN, Zoran, PETER, J. Crack propagation simulation by strain energy density method. Gép, 2002, évf. 53, szám 8/9, str. 32-37. [COBISS.SI-ID 7504406]</li></ul> |
|---|---|

| | |
|---|---|
| **List of publications which serve as a proof of teaching qualifications** | • REN, Zoran, BIĆANIĆ, Nenad. Simulation of progressive fracturing under dynamic loading conditions. *Commun. numer. methods eng.*, 1997, vol. 13, str. 127-138. [COBISS-ID 2672406]<br>• GLODEŽ, Srečko, REN, Zoran. The fatigue crack growth parameters for 20MnCr5 steel. Strojarstvo, 1998, vol. 40, no. 3/4, str. 85-88. [COBISS.SI-ID 4473110]<br>• FAJDIGA, Gorazd, FLAŠKER, Jože, GLODEŽ, Srečko, REN, Zoran. Numerično simuliranje površinske utrujenostne razpoke na zobeh zobnikov = Numerical simulation of the surface fatigue crack growth on gear teeth flanks. Stroj. vestn., 2000, letn. 46, št. 6, str. 359-369. [COBISS.SI-ID 5693206]<br>• ULBIN, Miran, GLODEŽ, Srečko, REN, Zoran, PETER, J. Crack propagation simulation by strain energy density method. Gép, 2002, évf. 53, szám 8/9, str. 32-37. [COBISS.SI-ID 7504406] |

| | |
|---|---|
| **Leader of the following research projects** | • Joint research project with University of Glasgow, Department of Civil Engineering, "Simulation of Fracturing of Heterogeneous Materials using Lattice Type Models", BC-MZT-ALIS Link št. 29, 1996-1998<br>• Joint research project with University of Rijeka, Građevinski fakultet, "Simulacije porušitvenih procesov v konstrukcijskih materialih", 1997-1998<br>• Joint research project with University of Zagreb, Fakultet za strojarstvo i brodogradnju, "Numerično modeliranje nelinearnih procesov deformiranja konstrukcij", 1998-1999<br>• Alexander von Humboldt Institutional Partnership project Advanced Computational Engineering Mechanics with Lehrstuhl für Technische Mechanik, Friedrich-Alexander Universität Erlangen-Nürnberg, 2001-2005, project coordinators Kuhn and Ren<br>• Joint research project with University of Aveiro, "Computational modelling of heterogeneous engineering materials", 2004-2005<br>• Joint research project with University of Technology Rzeszow "Computational modeling of fracture in heterogeneous engineering materials", 2004-2005,<br>• Joint research project with University of Split, " Razvoj novih metoda određivanja pogonske čvrstoće strojnih dijelova", 2005-2006 |

| | |
|---|---|
| **Participant in the following research projects** | • A Thematic Network for Promoting Best Practice Industrial Application of Finite Element Technology – FENET – 2001-2004 – G1RT-CT-2001-05034<br>• Programska raziskovalna skupina Inteligentno računalniško konstruiranje, 2004-2009. |

| | |
|---|---|
| **Supervision of MSc theses** | 6 |

| | |
|---|---|
| **Supervision of PhD theses** | 2 |

| | |
|---|---|
| **Examination of MSc theses** | 10 |

| | |
|---|---|
| **Examination of PhD theses** | 5 |

| Name of teacher: | Goran Turk |
|---|---|

| Employed at:<br>Since: | Univerza v Ljubljani, Fakulteta za gradbeništvo in geodezijo<br>1.4.1987 |
|---|---|

| Title:<br>Since:<br>In: | Associated Professor<br>1.2.2002<br>Engineering Mechanics |
|---|---|

| e-mail address, web page | gturk@fgg.uni-lj.si |
|---|---|

| Knowledge of foreign languages: | English, Italian |
|---|---|

| Qualifications | **- date of birth, nationality:** 27.2.1963, Republic of Slovenia<br>**- First degree obtained at:** University of Ljubljana, Department of Civil Engineering and Geodesy<br>**- Master degre obtained at:** University of Ljubljana, Department of Civil Engineering and Geodesy<br>**- Ph.D. degree obtained at:** University of Ljubljana, Department of Civil Engineering and Geodesy<br>**- additional education:**<br>**- previous employments:** |
|---|---|

| List of papers published in scientific journals | 1. SAJE, Miran, PLANINC, Igor, TURK, Goran, VRATANAR, Blaž. A kinematically exact finite element formulation of planar elastic - plastic frames. Comput. methods appl. mech. eng.. [Print ed.], 1997, vol. 144, no. 1/2, str. 125-151.<br>2. SAJE, Miran, TURK, Goran, KALAGASIDU, A., VRATANAR, Blaž. A kinematically exact finite element formulation of elastic-plastic curved beams. Comput. struct.. [Print ed.], 1998, vol. 67, no. 4, str. 197-214.<br>3. TURK, Goran, SAJE, Miran. Structural analysis of mass concrete block. Journal of the mechanical behaviour of materials, 1998, vol. 9, no. 1, str. 35-42.<br>4. AMBROŽIČ, Tomaž, TURK, Goran. Analiza natančnosti določitve koordinat točk v ravninski mreži z metodo Monte Carlo. Geod. vestn., 2000, let. 44, št. 1/2, str. 11-22.<br>5. TURK, Goran, LOGAR, Janko, MAJES, Bojan. Modelling soil behaviour in uniaxial strain conditions by neural networks. Adv. eng. softw. (1992). [Print ed.], 2001, vol. 32, str. 805-812.<br>6. KUHAR, Miran, STOPAR, Bojan, TURK, Goran, AMBROŽIČ, Tomaž. The use of artificial neural network in geoid surface approximation. AVN. Allg. Vermess.-Nachr., 2001, jahr. 108, 1, str. 22-27.<br>7. ZUPAN, Dejan, TURK, Goran. Nepristranska točkovna ocena karakterističnih vrednosti = Unbiased point estimate of characteristic value. Gradb. vestn., september 2001, let. 50, str. 206-214.<br>8. TURK, Goran, STOPAR, Bojan, AMBROŽIČ, Tomaž, KUHAR, Miran. Geoid height determination by artificial neural networks and collocation. J. appl. math. mech., 2001, vol. 81, suppl. 4, str. S997-S998.<br>9. AMBROŽIČ, Tomaž, TURK, Goran. Prediction of subsidence due to underground mining by artificial neural networks. Comput. geosci.. [Print ed.], 2003, vol. 29, str. 627-637.<br>10. BRATINA, Sebastjan, PLANINC, Igor, SAJE, Miran, TURK, Goran. Non-linear fire-resistance analysis of reinforced concrete beams. Struct. eng. mech., 2003, vol. 16, no. 6, str. 695-712.<br>11. VRANKAR, Leopold, TURK, Goran, RUNOVC, Franc. Combining the radial basic function eulerian and lagrangian schemes with geostatistic for modeling of radionuclide migration through the geosphere. Comput. math. appl. (1987). [Print ed.], 2004, vol. 48, no. 5, 1517-1529.<br>12. TURK, Goran, RANTA - MAUNUS, Alpo. Analysis of strength grading of sawn timber based on numerical simulation. Wood Sci. Technol., 2004, vol. 38, št. 7, str. 493-505.<br>13. VRANKAR, Leopold, TURK, Goran, RUNOVC, Franc. Modelling of radionuclide migration through the geosphere with radial basis function method and geostatistics. Zhäongguó gäongchéng xuékäan, 2004, vol. 27, no. 4, 455-.<br>14. TURK, Goran, LOGAR, Janko. Uporaba umetne inteligence v gradbeni konstruktivi = The application of artificial intelligence in structural engineering. Gradb. vestn., 1996, let. 35, št. 5/6/7, str. 147-153.<br>15. SAVŠEK-SAFIĆ, Simona, AMBROŽIČ, Tomaž, STOPAR, Bojan, TURK, Goran. Ugotavljanje premikov točk v geodetski mreži = Determining point displacements in a geodetic networks. Geod. vestn., 2003, let. 47, št. 1/2, str. 7-17. |
|---|---|

| List of | 1. AMBROŽIČ, Tomaž, TURK, Goran. Analiza natančnosti določitve koordinat točk v ravninski mreži z |
|---|---|

| publications which serve as a proof of teaching qualifications | metodo Monte Carlo. Geod. vestn., 2000, let. 44, št. 1/2, str. 11-22. |
|---|---|
| | 2. ZUPAN, Dejan, TURK, Goran. Nepristranska točkovna ocena karakterističnih vrednosti = Unbiased point estimate of characteristic value. Gradb. vestn., september 2001, let. 50, str. 206-214. |
| | 3. AMBROŽIČ, Tomaž, TURK, Goran. Prediction of subsidence due to underground mining by artificial neural networks. Comput. geosci.. [Print ed.], 2003, vol. 29, str. 627-637. |
| | 4. TURK, Goran, RANTA - MAUNUS, Alpo. Analysis of strength grading of sawn timber based on numerical simulation. Wood Sci. Technol., 2004, vol. 38, št. 7, str. 493-505. |
| | 5. SAVŠEK-SAFIĆ, Simona, AMBROŽIČ, Tomaž, STOPAR, Bojan, TURK, Goran. Ugotavljanje premikov točk v geodetski mreži = Determining point displacements in a geodetic networks. Geod. vestn., 2003, let. 47, št. 1/2, str. 7-17. |
| | 6. TURK, Goran, RAMIREZ, Martin R., COROTIS, Ross B. Structural reliability analysis of nonlinear systems. V: SCHUËLLER, G.I. (ur.), SHINOZUKA, M. (ur.), YAO, J.T.P. (ur.). Proceedings of ICOSSAR '93, Vol. 2 : The 6th International Conference on Structural Safety and Reliability, Innsbruck, Austria, 9-13 August 1993. Rotterdam: A.A. Balkema Publishers, 1994, str. 1345-1352. |
| | 7. TURK, Goran. Simulacije in metoda Monte Carlo. V: DUHOVNIK, Janez (ur.). Računalnik v gradbenem inženirstvu : zbornik 7. seminarja, Ljubljana, april 1994. Ljubljana: Fakulteta za arhitekturo, gradbeništvo in geodezijo, Oddelek za gradbeništvo in geodezijo, Inštitut za konstrukcije, potresno inženirstvo in računalništvo, 1994, str. 53-60. |
| | 8. ZUPAN, Dejan, TURK, Goran. On unbiased estimates of characteristic values. V: BREBBIA, Carlos Alberto (ur.). Risk analysis III. Southampton: WIT, 2002, str. 385-394. |
| | 9. ZUPAN, Dejan, TURK, Goran. Določanje karakterističnih vrednosti iz relativno majhnih vzorcev. V: LOPATIČ, Jože (ur.), SAJE, Franc (ur.). Zbornik 22. zborovanja gradbenih konstruktorjev Slovenije, Bled, 19. - 20. oktober 2000. Ljubljana: Slovensko društvo gradbenih konstruktorjev, 2000, str. 195-202. |

| Leader of the following research projects | L2-3231 Lepljeni leseni lamelirani nosilci v naravnem okolju, 1.7.2001 - 30.6.2004 |
|---|---|
| | L2-6147 Metode razvrščanja gradbenega lesa po trdnosti, 1.7.2004 - 30.6.2007 |

| Participant in the following research projects | J2-0780 Nelinearni problemi v teoriji konstrukcij, 1.7.1998 - 30.6.2001 |
|---|---|
| | L2-0629 Proces hidratacije cementa v betonu, 1.7.1998 - 30.6.2001 |
| | L2-1657 Analiza mehanosorptivnega lezenja lesenih lepljenih lamelianih elementov, 1.1.1999 - 30.6.2001 |

| Supervision of MSc theses | 0 |
|---|---|

| Supervision of PhD theses | 2 |
|---|---|

| Examination of MSc theses | 10 |
|---|---|

| Examination of PhD theses | 3 |
|---|---|

| Name of teacher: | IVAN VRKLJAN |
| --- | --- |

| Employed at:<br>Since: | University of Rijeka, Department of Civil Engineering<br>01.12.2002. |
| --- | --- |

| Title:<br>Since:<br>In: | Associate Professor<br>17.12.2003.<br>Geotechnical Engineering |
| --- | --- |

| e-mail address, web page | ivan.vrkljan@igh.hr; www.gradri.hr |
| --- | --- |

| Knowledge of foreign languages: | English |
| --- | --- |

| Qualifications | **- date of birth, nationality:** 19.01.1949, Republic of Croatia<br>**- First degree obtained at:** University of Sarajevo, Department of Mining Technology<br>**- Master degre obtained at:** University of Zagreb, Department of Civil Engineering<br>**- Ph.D. degree obtained at:** University of Zagreb, Department of Civil Engineering<br>**- additional education:** 1999. Attendance to workshop: Geotechnical Instrumentation for Field Measurements, University of Florida, Cocoa Beach, Noveember, 1-4, 1999.<br>**- previous employments:**Civil Engineering Institute of Croatia, Zagreb |
| --- | --- |

| List of papers published in scientific journals | 1. Vrkljan, I., Ženko, T., (2003) The Influence of Undergoround Water on Rock Mass Behaviour During Tunnelling, *RMZ-Material and Geoenvironment.* 50 (2003) 22-26<br>2. Ožanić, N., Rubinić, J., Vrkljan, I., (2003) The regime of inflow and runoff from vrana lake and the risk of permanent water pollution, *RMZ-Material and Geoenvironment*. 50 (2003) 281-5.<br>3. Vrkljan, I., Geotehničko projektiranje prema euronormi 7, 2000. **Rudarstvo**, br. 17-18, 9-22.<br>4. Vrkljan, I., Geotehničko projektiranje prema euronormi 7, 2000. **Rudarstvo**, br. 17-18, 9-22.<br>5. Jašarević,I., Hudec,M., Stojković,B., Plamenac,M., Vrkljan,I., Marenče,M. (1988): Osiguranje iskopa za tunele HE "Bekhme", **Građevinar**, 40 (1988) 11, 527-533.<br><br>6. Nonveiller,E., Szavits-Nossan,A., Lisaz,Z., Vrkljan,I., Mavar,R. (1982): Grundungsschacht 60 m tief als Brunnen abgesenkt, **Bauingenieur**, No. 57, str. 351-356. |
| --- | --- |

| List of publications which serve as a proof of teaching qualifications | 1. Vrkljan, I., Geotehničko projektiranje prema euronormi 7, Rad prezentiran na savjetovanju: Istraživanje i sanacija klizišta-multidisciplinarni pristup, Tuzla, 14-15 rujna 2000. Rad objavljen u časopisu Rudarstvo, br. 17-18, 9-22.<br>2. Vrkljan, I., Swelling rock Desturation and its influence on underground Structures, Geoeng2000, An International Conference on Geotechnical and geological Engineering, 19-24 November, 2000. Melbourne, Australia.<br>3. Vrkljan, I., Kavur, B., (2001) Experience gained in rock mass deformability testing by large flat jacks, Proceedings of the ISRM regional Symposium, Eurock 2001, Espo/Finland/ 4-7 june 2001, Rock Mechanics-a Challenge for Society, Sarka and Eloranta (eds), Eurock 2001, pp.191-196<br>4. Veinović, Ž., Kvasnička, P., Sesar, S., Vrkljan, I., (2001) Possible Application of Some Alternative Materials for Mineral Liners in Karst Regions, Mid-European Clay Conference, Stara Lesna, Slovakia. (poster prezentacija, knjiga apstrakata).<br><br>5. Vrkljan, I., (2002) Influence of Saturation on the Behavior of Swelling Rocks, Proceedings of the NARMS-TAC Conference, Vol 1, pp. 1119-1124. (Toronto, Canada, July 07 to July 10 2002)<br>6. Vrkljan, I., Ženko, T., (2003) The Influence of Undergoround Water on Rock Mass Behaviour During Tunnelling, 1st International Conference on Groundwater in Geological Engineering ICGGE 2003., 22-26 September 2003 Bled, Slovenia<br>7. Ožanić, N., Rubinić, J., Vrkljan, I., (2003) The regime of inflow and runoff from vrana lake and the risk of permanent water pollution, 1st International Conference on Groundwater in Geological Engineering ICGGE 2003., 22-26 September 2003 Bled, Slovenia.<br>8. Kovačević-Zelić, B., Kovačić, D., Vrkljan, I., (2004) Bentonitni tepisi u odlagalištima otpada, Razprave četrtega posvetovanja slovenskih geotehnikov, Rogaška Slatina str. 227-236. |
| --- | --- |

|  |  |
|---|---|
|  |  |

| **Leader of the following research projects** | 1. Bujanje stijena i njegov utjecaj na podzemne objekte, Ministarstvo znanosti i tehnologije Republike Hrvatske (šifra projekta: 2-11-420). |
| | 2. Ponašanje bubrivih stijena u geotehničkim građevinama, Ministarstvo znanosti i tehnologije Republike Hrvatske (šifra projekta: *0110221*). |
| | 3. Ivan Vrkljan, Investigation of mechanical properties of sheets in seal barriers (scientific  project MZOS No. 110-0831529-1517) |

| **Participant in the following research projects** | 1. Postavljanje nove teorije podzemnih pritisaka za jedan viskozno-elastoplastičan materijal uz primjenu odgovarajućih uslova loma, polazeći od kritičke analize postojećih teorija podzemnih pritisaka, Republička zajednica za naučni rad, Sarajevo, Dokumentacija Rudarsko-geološkog fakulteta u Tuzli, (1972). Project leader: Prof. M. Osmanagić. |
| | 2. Utvrđivanje najpovoljnijih oblika otkopnih komora na velikim dubinama kod uslojenih rudnih ležišta u heterogenim realnim sredinama sa gledišta stabilnosti i visoke produktivnosti rada, Republička zajednica za naučni rad Sarajevo, Dokumentacija Rudarskogeološkog fakulteta u Tuzli, (1976). Project leader: Prof. M. Osmanagić. |
| | 3. Istraživanja postojećih i novih metoda eksploatacije tuzlanskog sonog ležišta sa posebnim osvrtom na slijeganje gradskog područja Tuzle. Sintezna studija I. dio, Republička zajednica za naučni rad Sarajevo, Dokumentacija Rudarskogeološkog fakulteta u Tuzli, (1972). Project leader: Prof. M. Osmanagić. |
| | 4. Ivan Vrkljan: Underground pollution transport and risk assessment as a consequence of waste disposal (scientific  project MZOS No. 083-0831529-1528; project leader Roko Andričević, Faculty of Civil Engineering and Architecture of the University of Split) |

| **Supervision of MSc theses** | 0 |
|---|---|

| **Supervision of PhD theses** | 0 |
|---|---|

| **Examination of MSc theses** | 2 |
|---|---|

| **Examination of PhD theses** | 6 |
|---|---|

### 4.6.1. Professors' workload related to organized taught courses (core courses)

The professors' workload expressed in standard hours of active teaching is shown in the following table. The workload includes the professors' engagement in the core courses only. The optional courses provided within the major fields of study are organized on the basis of consultations. The professors' engagement related to such courses is explained in Section 4.6.2.

| Number | Professor/Course Lecturer | Undergraduate and graduate Studies | Doctoral Studies | TOTAL |
|---|---|---|---|---|
| 1. | Željko Arbanas | 430 | 180 | 610 |
| 2. | Julijan Dobrinić* | - | 45 | 45 |
| 3. | Svjetlan Feretić | 210 | 45 | 255 |
| 4. | Gordan Jelenić | 336 | 180 | 516 |
| 5. | Ivica Kožar | 280 | 135 | 415 |
| 6. | Nevenka Ožanić | 480 | 180 | 660 |
| 7. | Boris Podobnik | 330 | 45 | 375 |
| UKUPNO | | 2066 | 810 | 2876 |
| | Ostali nastavnici | 3493 | 0 | 3493 |
| UKUPNO | | 5559 | 810 | 6369 |

* External professor

The workload of the teaching staff engaged in active teaching of the doctoral study courses in relation to their total teaching workload in percentages: **28.16%.**
The workload of the teaching staff engaged in active teaching of the doctoral study courses in relation to the teaching workload of the entire Faculty's staff engaged in all study programmes in percentages: **12.72%.**

Active teaching is covered by the Faculty's staff up to **94.44**%.

The total number of standard hours of active teaching (core courses): **810**

**The total number of standard hours above the quota according to the provisions of the Collective Agreement**: 180 +  (336+180-300*1.2) +  (280+135-300*1.2) +  180 +  (330+45- 300*1.2) = **586**

**The total number of standard hours for the external professor**: 45

### 4.6.2. Professors' workload on optional courses

On top of the above described lecturing, angažman the doctoral study teachers are also engaged in running optional courses (without active lecturing) with approximate involvement of **15 hours per course per student**.

Projected number of studenats: 10
Number of optional courses per student: 3
Total number of teachers: 26

**The total number of standard hours above the quota according to the provisions of the Collective Agreement**: 15*10*3 = **450**

**Average number of hours per teacher:** 450/26=**17.31**

**4.6.23 Additional workload of professors engaged in the doctoral study programme**

In addition to the afore-mentioned teaching workload, the engagement of professors in doctoral studies comprises the following:

- Consultations regarding the professional guidance (supervision) making up a workload of up to **2 hours per week per student during two years of study** on average,
- Administrative engagement related to counselling and professional guidance (drawing up of half-yearly progress reports, participating at sessions of the Faculty Council and the Postgraduate Studies Committee on the subject of the doctoral study programme, participating in work groups responsible for monitoring the student's progress after he/she has received a negative progress report by their supervisors, organizing student study visits to other institutions, engagement related to procurement of equipment, samples, supplies, and similar) amounting to a workload of up to on average **12 hours per student per semester**,
- Participation in doctoral dissertation defence committees making up a workload of on average **82 hours per student** (24 hours for the preparation and 2 for attending the defence presentation in the case of each of the three members of the committee and 2 hours for attending the defence presentation in the case of the student supervisor and the Vice-dean for Postgraduate Studies),
- Participation in doctoral dissertation evaluation committees making up a workload of on average **80 hours per student** (one working week in the case of each of the two committee members from the Faculty staff),
- Participation in doctoral dissertation defence committees making up a workload of on average **20 hours per student** (one working day for the preparation and 2 hours for attending the defence presentation in the case of each of the two members of the committee form the Faculty staff).

Total number of professors: 26
Envisaged number of students: 10
Number of semesters per academic year: 2
Total number of weeks per academic year: 42
Number of academic years: 3

**The total number of hours of additional engagement of all professors in teaching doctoral courses**: 2*10*2*42 + 12*10*6 + 82*10 + 80*10 + 20*10 = 450 + 1680 + 720 + 260 + 820 + 800 + 200 = **4480**

The average number of hours of additional engagement in teaching doctoral courses per professor: 4480:26 = **172.31**

The average annual number of hours of additional engagement in teaching doctoral courses per professor: 172.31 : 3 = **57.44**

The average weekly number of hours of additional engagement in teaching doctoral courses per professor: 57.44:42 = **1.37**

**4.6.4. Additional workload of the Dean and members of the Postgraduate Studies Committee**

In addition to the afore-mentioned teaching and additional workload, some of the teaching staff engage in the following:

- Attending the sessions of and being actively involved in the activities of the Postgraduate Studies Committee in the amount of up to on average **10 hours per semester in the case of the Dean and each member of the Committee** (2x3 hours for the preparation and 2 hours for attending the sessions),
- Coordinating the activities related to the preparation of annual reports in the amount of up to on average **40 hours per year** (one working week in the case of the Vice-Dean for Postgraduate Studies).

Number of members of the Postgraduate Studies Committee: 5

**The total number of hours of additional engagement of the Dean and members of the Postgraduate Studies Committee**: 10*6*(5+1)+40*3 = **480**

### 4.6.5. List of supervisors and co-supervisors

The professors who are actively involved in scientific research activities in one or more scientific research fields of study covered by the doctoral programme may be appointed as supervisors to doctoral students. Other professors who are listed in the table may participate in the student supervision process as co-supervisors and shall be encouraged to do so as well. An external recognized expert in the chosen field of study meeting the afore-mentioned requirements may also be selected as student supervisor, in which case the Faculty Council shall appoint at least one of the professors of the Faculty as a co-supervisor.

| Number | Teacher | Research interest (field) | | Supervisor | Co-supervisor |
|--------|---------|---------------------------|---|------------|---------------|
| 1. | Željko Arbanas | Geotehnika | | Da | Da |
| 2. | Gojko Balabanić | Materijali | | Da | Da |
| 3. | Čedomir Benac | Geološko inženjerstvo | | | Da |
| 4. | Adriana | Nosive konstrukcije | | Da | Da |
| 5. | Ognjen Bonacci | Hidrotehnika | | Da | Da |
| 6. | Boštjan Brank | Tehnička mehanika | | Da | Da |
| 7. | Mehmed | Tehnička mehanika | | Da | Da |
| 8. | Julijan Dobrinić | Brodogradnja | | | Da |
| 9. | Svjetlan Feretić | Matematika | | | Da |
| 10. | Suzana Ilić | Hidrotehnika | | Da | Da |
| 11. | Gordan Jelenić | Tehnička mehanika | | Da | Da |
| 12. | Barbara | Hidrotehnika | | Da | Da |
| 13. | Boris Kompare | Hidrotehnika | | Da | Da |
| 14. | Zorko Kos | Hidrotehnika | | Da | Da |
| 15. | Vedrana Kozulić | Tehnička mehanika | | Da | Da |
| 16. | Ivica Kožar | Tehnička mehanika | | Da | Da |
| 17. | Janko Logar | Geotehnika | | Da | Da |
| 18. | Leo Matešić | Geotehnika | | Da | Da |
| 19. | Darko Meštrović | Nosive konstrukcije | | Da | Da |

| 20. | Nevenka Ožanić | Hidrotehnika | | Da | Da |
|-----|----------------|--------------|---|----|----|
| 21. | Joško Ožbolt | Tehnička mehanika | | Da | Da |
| 22. | Boris Podobnik | Fizika | | | Da |
| 23. | Nenad Ravlić | Hidrotehnika | | Da | Da |
| 24. | Zoran Ren | Tehnička mehanika | | Da | Da |
| 25. | Goran Turk | Tehnička mehanika | | Da | Da |
| 26. | Ivan Vrkljan | Geotehnika | | Da | Da |

## 4.7.    LIST OF EDUCATIONAL SITES USED FOR DELIVERY OF THE PROGRAMME

The educational and research activities shall be performed at the educational sites and bases of the Faculty of Civil Engineering of the University of Rijeka. The existing equipment of the Faculty shall be used in the delivery of the program:

- Equipment for field hydrometric measuring;
- Equipment for static and dynamic measuring of structure behaviour;
- Equipment for field geotechnical testing;
- Electronic equipment (hardware) and the belonging program packages (software) in the field of structures, numeric modelling, hidrotechnics and geotechnics.

Until the Faculty of Civil Engineering does not move to the new facilities within the University Campus that will be built on Trsat by 2008, it will not be forming own laboratories needed for the delivery of postgraduate educational and research activities, rather it will use the following educational sites and bases on the basis of cooperation agreements in scientific research activities:

1. Laboratory for concrete, cement, steel products and road building of the Croatian Institute of Civil Engineering - Rijeka. The laboratory holds the ISO Certification issued by the State Institute of Standardization and Metrology, HRN EN ISO/17025:2000 for testing of the physical and mechanical qualities of fresh concrete, metal materials, asphalt mixtures and rock aggregates. The laboratory has all the necessary equipment for conducting such testings as well as qualified staff and head of laboratory (Ivanka Skender, B. Sc. in Civil Engineering). The relevant documentation confirming the possession of the certificate and the approval for the use of the site to conduct postgraduate programme educational activities of the Faculty of Civil Engineering of the University of Rijeka are provided in Appendix B.
2. Laboratory for geotechnics and field measuring of the Croatian Institute of Civil Engineering, Institute of Geotechnics, Zagreb. The laboratory holds the ISO Certification issued by the State Institute of Standardization and Metrology, HRN EN ISO/17025:2000 for testing of the physical and mechanical qualities of fresh concrete, metal materials, asphalt mixtures and rock aggregates. The Laboratory has all the necessary equipment for conducting such testings as well as qualified staff and head of laboratory (Ivan Vrkljan, PhD. Sc. in Mining, who also works in the capacity of an Associate Professor at the Faculty and is engaged in the proposed doctoral study programme). The relevant documentation confirming the possession of the certificate and the approval for the use of the site to conduct postgraduate programme educational activities of the Faculty of Civil Engineering of the University of Rijeka are provided in Appendix B.
3. Technical resources (hardware and software) of the Studio-Ars Company from Rijeka in the field of GIS technology. Studio-Ars d.o.o. from Rijeka is a renowned representative and authorized member of the network of developers of the Autodesk Program and the authorized Autodesk System Center for GIS technology. The company has all necessary hardware and software equipment to work on the GIS technology as well as qualified staff and an authorized representative (Dražen Galić, M. Sc. in Civil Engineering). The relevant certificates issued by Autodesk on accreditation of Studio-ars as an

authorised Autodesk System Center for the territory of Croatia providing a range of software packages, and the affiliation with the Autodesk Developer Network (ADN) Programme, as well as the approval for the use of the site to conduct the postgraduate programme educational activities of the Faculty of Civil Engineering of the University of Rijeka are provided in Appendix B.

All other scientific institutions that the University of Rijeka and its Faculty of Civil Engineering foster cooperation with in the field of scientific research, regulated by cooperation agreements in scientific research activities, in which some of the activities envisaged by the postgraduate programme of the Faculty shall be performed, are considered educational/teaching sites as well.

In the new facilities of the Faculty within the University Campus planned to be built on Trsat by 2008, the Faculty of Civil Engineering plans to establish new laboratories for hydrotechnics, geotechnics, roads, material and structure testing and analysis.

## 4.8. OPTIMUM NUMBER OF STUDENTS

The optimum number of students eligible to enrol in the postgraduate doctoral programme in civil engineering considering the space, equipment, the number of professors and potential supervisors is ten. The maximum number of students considering the afore-mentioned parameters is fifteen.

## 4.9. ESTIMATION OF COSTS PER STUDENT

The total price of the doctoral study has been determined on the following components:

### 4.9.1. Cost of teaching equipment and its amortization

The cost of the teaching equipment and its amortization per student equals the cost of the teaching equipment and its amortization per undergraduate student.

### 4.9.2. Recurring material costs of Faculty building maintenance

The recurring material costs of maintenance of the Faculty building per student equal the recurring material costs of the same per undergraduate student.

### 4.9.3. Cost of administering the study programme by the Dean and Vice-Deans

The total number of hours of the engagement of the Dean and Vice-Dean in the Postgraduate Studies Committee (Section 4.6.2): 300
Average unit price of work (coefficient: 3.05): HRK 183.46
Total price of work: **HRK 55,038.00**

### 4.9.4. Cost of administering the programme by other members of the Postgraduate Studies Committee

The total number of hours of the engagement of the Dean and other members of the Postgraduate Study Committee (Section 4.6.2): 180
Average unit price of work (coefficient: 3.05): HRK 183.46
Total price of work: **HRK 33,028.80**

### 4.9.5. Cost of travel and accommodation for visiting professors

In principle, each student will register for three optional courses available in the second semester of study, i.e. the envisaged fifteen students will register for 30 optional courses, leaving each of the twenty-six professors with on average 1.15 students in their optional courses. Nine visiting professors are envisaged to serve 10 students. Two visits by visiting professors are envisaged per each student. We should add to this one visit per student of an external doctoral dissertation defence committee member.

Estimated average round-trip travel cost: HRK 500.00
Estimated average overnight accommodation cost: HRK 1000.00
Estimated number of visits: 30
Total travel and accommodation expenses for the visiting professors: **HRK 45,000.00**

### 4.9.6. Recurring material costs of the study programme

The recurring material costs of the study programme basically refer to the cost of computer and software equipment, including the support system and the material cost of laboratory analyses and testings.

Estimated recurring material costs of the study programme per student: HRK 10,000.00
Number of doctoral students: 10
Total recurring material costs of the study program: **HRK 100,000.00**

### 4.9.7. Cost of student study visits to other scientific research institutions

Estimated average price of a one-month visit: HRK 5000.00
Duration of stay: 4 months
Number of students: 10
Cost of student study visits to other scientific research institutions: **HRK 200,000.00**

### 4.9.8. Cost of student participation at scientific and specialized conferences

Each student is envisaged to participate in at least one home and one international conference.

Estimated home conference admission amount per student: HRK 750.00
Estimated travel expenses for participation at a home conference: HRK 500.00
Estimated cost of a 4-day stay at the home conference: HRK 2000.00
Estimated international conference admission amount per student: HRK 750.00
Estimated travel expenses for participation at an international conference: HRK 2000.00
Estimated cost of a 4-day stay at an international conference: HRK 2000.00
Number of students: 10
Total cost of student participation at scientific and specialized conferences: HRK **80,000.00**

### 4.9.9. Cost of computer and laboratory support

It is expected that the computer and lab support would require approx. 50% of the workload of one associate expert.

Total number of work years of the associate expert: 0.5 x 3 years = 1.5
Annual price of work (coefficient: 1.25): HRK 72,294.90
Total price of work: **HRK 108,442.35**

### 4.9.10. Cost of administering the study programme by administrative personnel

The program envisages a new work position of a Secretary for Postgraduate Studies who would be responsible for handling all secretarial, accounting and student affairs related to the postgraduate studies.

Total number of work years: 3
Annual price of work (coefficient: 1.60): HRK 95,429.27
Total price of work: **HRK 286,287.81**

### 4.9.11. Cost of additional workload of professors of the Faculty

Total number of hours of additional engagement per professor (Section 4.6.2): 172.31
Number of the professors of the Faculty: 17
Average unit price of work (coefficient: 3.05): HRK 183.46
Total price of work: **HRK 537,403.87**

### 4.9.12. Cost of lectures of professors of the Faculty

Total number of professors of the Faculty: 17
Average unit price of work (coefficient: 3.05): HRK 183.46
Total number of standard hours (Sections 4.6.1 and 4.6.2): 586 + 17*17.31 = 707.17
Total price of work: **HRK 129,737.41**

### 4.9.13. Cost of additional workload of visiting professors

Total number of hours of additional engagement per professor (Section 4.6.2): 6990:24 = 172.31
Number of visiting professors: 9
Average unit price of work (coefficient: 3.05): HRK 183.46
Total price of work: **HRK 284,507.93**

### 4.9.14. Cost of lectures of visiting professors

Total number of visiting professors: 9
Total number of standard hours (Sections 4.6.1 and 4.6.2): 45 + 9*17.31 = 200.79
Average unit price of work (coefficient: 3.05): HRK 183.46
Total price of work: **HRK 36,836.93**

**The total cost of doctoral study programme: HRK 1,896,283.13** (excluding the cost of amortization and the cost of Faculty building maintenance)

**Cost of study programme per doctoral student: HRK 189,628.31** (excluding the cost of amortization and the cost of Faculty building maintenance)

### 4.10.    FINANCING OF THE DOCTORAL STUDY PROGRAMME

The study programme is financed from the following four main groups of sources:

- own funds of the Faculty,
- research projects and external funds,
- responsible Ministry and University,

-   personal contributions by the students.

The programme is additionally financed by the state grants, scholarships and bursaries, state and University funds, budget of the international colaboration, collaboration agreements with home and foreign institutions (student and researcher exchanges), and collaboration agreements between the University, County and City.

The status of the doctoral students will be defined by the State laws and the Study Regulations of the Faculty.

The Faculty shall use its own resources to finance the cost of equipment and its amortization (Section 4.9.1), as well as the cost of Faculty building maintenance (Section 4.9.2). Engagement of the Dean and the Vice-Deans and other members of the Committee of the postgraduate studies (Sections 4.9.3 and 4.9.4) are considered part of the regular work activities compensated in the framework of the existing personal incomes. The Faculty will cover the costs of travel and accommodation of visiting professors (Section 4.9.5) from the budget dedicated for the purposes of international collaboration.

The recurring material costs of the programme (Section 4.9.6), the cost of participating at various scientific and specialized conferences and seminars (Section 4.9.7), and the cost of student study visits to other institutions (Section 4.9.8) shall be primarily financed by the scientific research projects upon which the study programme has been based. Where appropriate, these costs will be partly financed by the Faculty and, in particular when it comes to the doctoral students which are not the Faculty employees, by the state, university and related foundations, on the basis of international cooperation sources, and cooperation agreements with related institutions.

The Faculty expects to receive support from the Ministry of Science, Education and Sports in opening new work positions (Sections 4.9.9 and 4.9.10). Until then, these services will provide the Faculty by re-distributing the workload of its present employees.

The engagement of the professors of the Faculty in addition to active teaching (Section 4.9.11) makes an additional activitiy which the Faculty also expects to be  recognized as such by the Ministry of Science, Education and the Sport when it comes to approving new academic positions based on the existing workload. Until then, these activities shall be considered a part of the regular work activities compensated in the framework of the existing personal incomes.

Financing the costs of the overtime work of the Faculty teachers (Section 4.9.12)  is also deemed to be a responsibility of the Ministry of Sciene, Education and the Sport Sport when it comes to approving new academic positions based on the existing workload. Currently, these expenses remain to be covered from other sources and amount to HRK 129,737.41 or **HRK 12,973.74** per student.

The costs of engagement of the visiting professors in teaching (Section 4.9.14) and outside of it (Section 4.9.13) amount to HRK 321,344.86 or **HRK 32,134.49** per student. The total study cost per student for which the financing has not been secured thus amounts to **HRK 45,108.23**.

It is expected that for the students who are also the Faculty employees these expenses shall be covered by the Ministry of Science, Education and the Sport. Until then, the Faculty will cover these costs from its own funds or from the budget of the research projhects on which the study programme has been based.

The students who are not the Faculty employees cover these expenses  by paying the scholarship fees. These should be appropriately scaled to account for the Faculty overheads according to the valid

Regulations for distribution of the market income. The scholarship fees per student are then finally defined to be **HRK 60,000** or **HRK 10,000** or per semester of study.

Self-financing doctoral students can apply for support in financing the study programme from the state, university and related foundations, as well as on the basis of scientific research projects, and cooperation agreements between the Faculty and their professional organizations.

## 4.11.    QUALITY OF THE DOCTORAL STUDY PROGRAMME

The quality of the doctoral study programme, its components and courses is ensured through:

- Careful selection of the most qualified candidates (Section 2.6),
- Contractual relationships between the students and the Faculty (Section 4.5),
- Appointing student counsellors and supervisors (Section 3.6),
- Courses (Section 3.4.3),
- Appropriate facilities and qualified staff for performing scientific research and acquiring the prescribed credits according to the European Credit Transfer System (Section 4.7),
- Student study visits to other university and scientific institutions (Section 3.1),
- Publishing the results and findings of students in scientific journals listed in the world's most prestigious databases (Section 3.10).

The quality of the doctoral study programme, its components and courses is followed through continuous monitoring of the delivery of study programmes on the basis of various forms of evaluations and self-evaluations of professors, students and the related services by the Faculty of Civil Engineering of the University of Rijeka. The Secretary of the **Postgraduate Studies Committee** (see Section 4.4) will conduct the following activities:

- Conduct interviews with students and professors about all aspects of the educational programme,
- Publicly present the results of the surveys and interviews with students and professors regarding all aspects of the educational programme to both professors and students, and, if necessary, to the University Senate,
- Keep records on professors – professor portfolios (student opinions, work on improving the scientific research and teaching activities, additional teaching educational activities, sabbaticals, and similar)
- Make analysis of examinations (success, transparency, objectivity, and similar),
- Make analysis of the effectiveness of the supervision process,
- Make analysis of the effectiveness of the study programme in general (average passing grade by years of study, and similar),
- Conduct evaluation of specialized and related services within the Faculty.

The quality of the supervision is ensured by:

- Proven qualifications of all potential supervisors (Section 4.6.4),
- Adequate qualifications of all potential co-supervisors (Section 4.6.4).

The quality of the supervision process is followed in the framework of activities for monitoring the entire implementation of the programme, and additionally through analysis and acceptance or rejection of regular half-yearly student progress reports by the Dean or the Faculty Council, as well as on the basis of the student's declaration regarding the negative progress report drawn up by the supervisor (Section 3.6). The quality of supervision is finally objectively proven by publishing the results of the doctoral research in

scientific journals listed in the most prestigious world databases such as the CC, SCI and SCI Expanded prior to defending the doctoral dissertation.

The advancement or timely termination of the process for earning a doctoral degree in the case of each particular student is ensured on the basis of half-yearly student progress reports submitted by the supervisor or counsellor to the Dean. The progress of the students is followed in the same way, as well as on the basis of the following activities:

- Various forms of work presentations and transfer of knowledge (Section 3.3),
- Defence of the doctoral dissertation (Section 3.10),
- Written certificate made out by the supervisor approving the defence of the doctoral dissertation (Section 3.10).

The methodology for monitoring the outcomes of the study process defined in Sections 2.7, 3.3 and 3.6 and on the basis of provisions from the Statute and the Study Regulations of the University of Rijeka as well as the Recommendation of the Rector's Council is described in Sections 3.3, 3.6 and 3.10.

The Vice-Dean for Postgraduate Studies is responsible for drawing up an Annual Report on Doctoral Studies that should encompass all student and teaching staff activities related to the delivery of the doctoral study programme within an academic year. The Annual Report on Doctoral Studies is submitted by the Vice-Dean to the Postgraduate Studies Committee. After it has been adopted, the report is publicly published. Additional activities of the Postgraduate Studies Committee the purpose of which is to ensure quality delivery of the study programme and monitoring of the student's progress throughout the schooling are described in Section 4.4.

An integral part of the proposed postgraduate doctoral study programme is the integration of students in the activities of the Faculty through involvement in the teaching process, through presentations of their work at specialized conferences, presentations of their research or educational results through active involvement in the series of scientific research and educational seminars organized by the Faculty. The students will be given an opportunity and encouraged by a significant number of the teaching staff to publish their findings and the doctoral dissertation in English or some other generally accepted language in the chosen scientific research field.

By participating at scientific research seminars and through regular follow-up of the same, the students and the teaching staff exchange problems, knowledge and experiences outside the narrow circle of student and supervisor, ensuring a more objective evaluation of own work and developing the need to keep high standards of the quality of studies. By participating at educational seminars and through regular follow-up of the same the students and the teaching staff exchange problems, knowledge and experiences within the field of education, improving in doing so the skills necessary for a quality transfer of knowledge, which the Faculty deems very important for future doctoral degree holders.

# 5. APPENDIX A: APPROVALS AND STATEMENTS

In the hardcopy of the study programme this Appendix was incuded by scanning the original approvals and statements. As it proved to be impossible to convert these scans into the required rich text format, this Appendix has been omitted here.

# 6. APPENDIX B: CLASSIFICATION OF RESEARCH PAPERS

**Category A**     Papers published in journals indexed (cited) in CC (Current Contents), SCI (Science Citation Index), SCI Expanded.

**Category B**     Papers published in journals indexed (cited) in other significant bibliographic databases as (in the alphabetic order):

ACM Computing Reviews; Acquatic Sci. & Fisheries Abstracts; Aluminium Industry Abstracts; Analytical Abstracts; Applied Mechanics Reviews; Bibliographia Cartographica; BMT Abstract (British Maritime Technology);  CA Search; CAB Abstracts; CAD/CAM Abstracts; Cambridge Science Abstract (CSA); Catalogue, Index of Periodicals; Chemical Abstract; Civil Engineering; Civil Engineering Abstracts; Compendex; CompuScience; Computer Literature Index; Computing Reviews; Corrosion Abstracts; Current Bibliography on Science and Technology; Dana Base Francis; Dialog Sourceone (SM Eng); Energy Science and Technology; Engineered Materials Abstracts; Engineering Index; Engineering Information Inc; Enviroeng; Environmental Periodicals Bibliography; FLUIDEX; Fluid Abstracts; Geo Abstract; Geoarchive; Geobase; Geodesy Bulletin; GEOPHOKA; Georef; Geo Struct Info; Geotechnical Abstracts; Geotitles; Iconda; Information Science Abstracts; INSPEC; International Civil Engineering Abstracts; International Petroleum Abstracts/Offshore Abstracts; ISI Proceedings; ITRD; Marine Technology Abstracts; Maro Polymer notes; Material Science Citation Index; Mathematical Reviews (MathSciNet); Mechanics; Mechanical Engineering Abstracts; Metals Abstracts; Mineralogical Abstracts; MSCI (Morgan Stanley Capital International); PASCAL; Petroleum Abstracts; RAPRA Rubber and Plastics; Research Alert; SCISEARCH; Science Abstract; Scopus; Shock and Vibration Digest; Theoretical Chemical Engineering Abstracts; TRIS; World Aluminum Abstracts; World Surface Coatings Abstracts; Zeitschrift für Geodäsie, Geoinformation und Landmanagement ; Zentralblatt MATH

**Category C**     Papers published in national journals outside those that fall into Categories A or B

**Category D**     International scientific meeting (conference, congress, symposium) in Croatia or abroad organised by or under auspices of  an international professional society or a reputable international institution, with an international scientific committee and a board of reviewers