



UNIVERSITY OF RIJEKA
FACULTY OF CIVIL ENGINEERING



SPECIALISATION
VOCATIONAL GRADUATE PROGRAMME IN

CIVIL ENGINEERING

Rijeka, October 2005

STUDY PROGRAMME AND CURRICULUM

Specialisation Vocational Graduate Programme in CIVIL ENGINEERING

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1. INTRODUCTION

During the implementation of the Bologna process the Faculty of Civil Engineering of the University of Rijeka plans to reform the current study programmes (academic, vocational and postgraduate programmes) in line with the principles of the Bologna Declaration, namely in accordance with the propositions of the European Credit Transfer System (ECTS). This will be performed in order to promote student mobility in the Integrated European Higher Education Area.

During a thirty-year activity of the Faculty of Civil Engineering of the University of Rijeka, a total of **943 Diploma Engineers** have graduated from the Academic Programme, and **1305 Engineers from the Vocational Programme**.

In structuring the new study programmes, the Faculty has followed the experience in educating civil engineering personnel. For the purpose of integrating Croatia into the European Higher Education and Labour Area, the needs of the labour market have been considered, and the demands that will be set on prospective students, the Faculty, its staff and specialists in civil engineering, have been assessed. Consideration has been given to the fact that the Faculty of Civil Engineering in Rijeka is the only higher education institution in the greater area (the Primorsko-goranska County, the Istrian County, and the Lika-Senj County) that educates civil engineering professionals. Due to the present-day intense activity in planning, designing and constructing the infrastructure (transportation systems, housing development, water supply systems, etc.) there is a great need for highly educated personnel in civil engineering. Figures show that **there are no unemployed Diploma Engineers and Engineers in Civil Engineering registered with the employment agencies**.

It is safe to say that the trend toward an intense infrastructure construction will also continue in the years to come (during the process of approach and admission of Croatia to the European Union). In the longer term, the need to plan and design new civil engineering structures will be transformed into the need to manage, maintain and reconstruct the infrastructure systems. Therefore, part of the curriculum has also been adapted to meet this demand.

In this phase, a *Specialisation Vocational Graduate Programme* (that, according to need, might evolve into an Academic Graduate Programme), dealing with the **economy of construction, infrastructure systems and building construction** has been planned, also as a result of a specific need for such personnel noticed in the public sector and the economy of the coastal region of our country.-

In the course of structuring the undergraduate and graduate programmes, the programmes of respectable foreign institutions that educate personnel of the same profile (the University of Engineering of Prague, the University of Engineering of Munich: Technische Universität München-Studienplan für Studierende des Bauingenieurwesens, Eigenossische Technische Hochschule Zürich-ETH-Abteilung für Bauingenieurwesen in Zürich), were analysed and the recommendations of the association of European Faculties of Civil Engineering (European Civil Engineering Education and Training – EUCEET) were accepted. This was performed through coordination inside the TEMPUS Project «Restructuring and Updating of Civil Engineering Curriculum» (in which the 4 Faculties of Civil Engineering from Croatia, along with international experts and scientists, were, and still are, cooperating).

The **Faculty teachers** were actively included in structuring the study programmes, and the **students** were consulted, too. The structure of the study programme was accepted at the Board of the Faculty of Civil Engineering on 21st December 2004.

The scheme adopted according to education cycles is «3+1,5», namely:

- Three-year Vocational Undergraduate Programme in Civil Engineering
- One-year Specialisation Vocational Graduate Programme in Civil Engineering.

The proposal of a one-and-half-year Specialisation Vocational Programme in Civil Engineering is the result of the need for additional education and specialization of the students who will graduate in the Vocational Undergraduate Programme. The candidates who have completed the Academic Undergraduate Programme can also apply for enrolment.

The Engineers in Civil Engineering who have completed the current Vocational Programme (of three years' duration) can be included in this educational cycle. The possibility of further education has not been offered to this group of professionals up to now although in practice their knowledge and competences are often insufficient for the jobs they perform. An employment analysis for civil engineers has shown that they are frequently employed in the public sector (public utility companies, local self-government units) or the private sector connected with planning, executing and supervising civil engineering works.

The curriculum of the Specialisation Vocational Graduate Programme is connected with public utility systems in general, and in its optional part, with coastal constructions and managing municipal systems with some features characteristic of coastal areas.

The need for a study programme profiled in this way arises from the fact of intensive construction and revitalisation of coastal areas (smaller towns) which requires educating professionals in the field of civil engineering in order to prevent an irretrievable devastation of the environment.

2. GENERAL INFORMATION

2.1. PROGRAMME NAME

The name of the programme is **Specialisation Vocational Graduate Programme in Civil Engineering**.

2.2. PARTY MANAGING AND CARRYING OUT STUDY PROGRAMMES

The party managing and carrying out all the proposed programmes will be the Faculty of Civil Engineering of the University of Rijeka with its basic organisation units: the Sections for Mathematics, Geotechnical Engineering, Hydraulic Engineering, Structures, Modelling Structures and Materials, Construction Engineering, Construction Management, Transportation Engineering, Engineering Mechanics, Physics and other courses.

2.3. PROGRAMME DURATION

The duration of the Specialisation Vocational Graduate Programme is one and half (1,5) academic year. On its completion, the student obtains a minimum of 90 ECTS credits.

2.4. PROGRAMME ENTRANCE REQUIREMENTS

A Specialisation Vocational Graduate Programme can be enrolled by a candidate who has completed an Academic or Vocational Undergraduate Programme at the Faculty of Civil Engineering of the University of Rijeka (with a total of 180 ECTS credits) or has completed an Undergraduate or Vocational Programme at some of the Faculties of Civil Engineering (with which the Faculty of Civil Engineering of the University of Rijeka has an agreement on student mobility) or at a related Faculty of Engineering (with which the Faculty of Civil Engineering of the University of Rijeka has an agreement on student mobility), at which the candidate has obtained 180 ECTS credits, or as defined by the Faculty regulations.

The candidates who have completed the Vocational Programme (of five semesters' duration) at the Faculty of Civil Engineering in Rijeka as well as the students who have completed an identical programme (with a difference in curriculum up to 25%) at another institution of higher education in the Republic of Croatia or elsewhere have the right to apply for enrolment on the programme.

The citizens of the Republic of Croatia, foreign citizens and persons without citizenship have the right to apply for enrolment under the same conditions.

2.5. COMPETENCES ACQUIRED BY THE STUDENT WITH COMPLETION OF THE STUDY PROGRAMME

With completion of the *Specialisation Vocational Graduate Programme*, the student acquires basic competences to understand and solve problems in a specific, narrow branch of civil engineering. He is qualified for participating in planning and maintaining civil engineering structures and infrastructure systems with an emphasis on the peculiarities of construction in coastal areas.

The student acquires the ability to define and solve problems from his narrow specialisation.

The object of the programme is to qualify the students and present-day professionals in civil engineering for the estimation of projects and the execution of works in coastal regions in order to preserve the autochthonous architectural heritage of the North Adriatic, Istria and the Croatian coastal region in general.

2.6. VOCATIONAL TITLE OR DEGREE ACQUIRED ON COMPLETION OF THE PROGRAMME

The vocational title and degree acquired on completion of the Specialisation Vocational Graduate Programme based on the proposed programme is **Specialist in Civil Engineering**.

3. PROGRAMME DESCRIPTION

3.1. LIST OF MANDATORY AND OPTIONAL COURSES

List of mandatory courses

	Course Code	Mandatory Courses	Hours of Active Classes (L+E+S)	ECTS
1.	OA-915	Civil Engineering Regulations	30+0+0	4
2.	H-824	Natural Basis of Water Occurrence in Littoral	30+0+15	5
3.	OA-900	Planning of Infrastructure Systems	45+0+15	6
4.	P-961	Geographic Information Systems and Municipal Database	30+45+0	7
5.	OA-901	Public Buildings and Spaces	30+30+0	6
6.	OA-906	Tourist Constructions	30+15+0	5
7.		Final Year Specialisation Project	0+0+60	15

List of optional courses

	Course Code	Optional Courses	Hours of Active Classes (L+E+S)	ECTS
8.	OA-907	Architectural Heritage Renewal	30+0+15	4
9.	P-960	Transport Infrastructure	30+15+0	4
10.	H-820	Hydraulic Structures in Urban Areas	30+15+15	5
11.	OA-912	Investment Policy	30+15+0	4
12.	OA-905	Equipment for Urban Spaces	20+10+0	3
13.	OA-904	Building Maintenance	30+15+0	5
14.	H-821	Waste and Waste Water Management	30+0+30	5
15.	H-823	Construction of Marinas and Ports	30+30+0	5
16.	H-822	Water-course Restoration	20+10+0	3
17.	H-825	Water Supply and Sewerage	30+30+0	5
18.	H-826	Coastal Structures	30+30+0	5
19.	P-962	Introduction to Urban Roads and Intersections	30+15+0	5
20.	OA-913	Introduction to Design II	30+30+0	5
21.	P-914	Traffic, Space and Environment	30+0+15	4
22.	OA-963	Management in Civil Engineering	45+0+0	4

3.2. DESCRIPTION OF COURSES

3.2.1. Description of Compulsory and Optional Courses

Course:	PLANNING OF INFRASTRUCTURE SYSTEMS
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Course code: OA-900	Pre-requisites:	Hours of Active Classes: 60 lectures: 45 exercises: 0 seminars: 15
Course status: optional	The course consists of: lectures - seminars	ECTS: 6

Course objectives	Students are expected to be able to participate in the process of urban planning and elaboration of urban studies and plans from the point of view of civil engineering.
Syllabus	<ul style="list-style-type: none"> - Basic terms and definitions of urban planning, spatial planning and land use - Urban studies and land use plans: types, characteristics, basic parts - Policy making methodology - Regulations, institutions and laws in the process of planning and implementation of urban plans - History of urban planning - Geographical, functional and economical impacts on the development of urban areas and regions - Analysis and space planning of different activities: residence, work, industry, recreation, green spaces and parks, traffic and other infrastructure systems, tourism, historical and cultural objects and areas - Methods and techniques of planning and decision making: theory and practise - Some aspects of urban space planning in the costal region of Croatia - Basic social, economical and environmental impacts on urban planning - Examples of urban studies and plans; discussion
Student obligations	<ul style="list-style-type: none"> – attending classes – seminar work
Exam	Written and/or oral exam
Assessment	Seminar work an exercises 25% + written (and/or oral) exam 75%
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Marinović-Uzelac, A.: Prostorno planiranje. - Zagreb: Dom i svijet, 2001. 2. Milić, B.: Razvoj gradova kroz stoljeća I (1994), II (1994) i III (2002) - Zagreb: Školska knjiga. 3. Marinović-Uzelac, A.: Naselja, gradovi i prostori. - Zagreb: Tehnička knjiga, 1986. 4. Zakoni i propisi u svezi prostornog planiranja i prostornog uređenja i građenja. - Zagreb: Narodne novine RH. <p>Recommended:</p> <ol style="list-style-type: none"> 1. Prinz, D.: Staedtebau. - Stuttgart: Kohlhammer, 1988. i 1992. 2. Mumford, L.: Grad u historiji. - Zagreb: Naprijed, 1968. 3. Ščitaroci, M.-O.: Hrvatska parkovna baština. - Zagreb: Školska knjiga, 1992. 4. Marinović-Uzelac, A.: Teorija namjene površina u urbanizmu. - Zagreb: Tehnička knjiga, 1989. 5. Meise, J., Volwahren, A.: Stadt- und Regionalplanung. - Vieweg und Sohn, 1980. 6. Marinović-Uzelac, A.: Socijalni prostor grada. - Zagreb: SN Liber, 1986. 7. Maksimović, B.: Urbanizam. - Beograd: Naučna knjiga, 1980. 8. Prostorno-planska dokumentacija (općina, grad, županija, makroregija, država, Europska unija).

Course:	PUBLIC BUILDINGS AND SPACES
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Course code: OA-901	Pre-requisites:	Hours of Active Classes: 60 lectures: 30 exercises: 30 seminars: 0
Course status: mandatory	The course consists of: lectures exercises -	ECTS: 6

Course objectives	To inform students about the methodology of planning and qualify them for reading and possibly elaborating the planning documentation.
Syllabus	<ul style="list-style-type: none"> - Arranging pedestrian zones in an urban environment, historical review. - From a regional plan to an executional project. - Streets and squares, business and trade pedestrian zones, shop-windows, terraces, eaves. Traffic solutions. - Parking areas and public garages. Public transportation stations. - Traffic buildings, bus and train stations, terminals. - Markets, trade-centres, public toilets. - Green areas and recreational zones, playgrounds, walks and parks. - Sports grounds and halls. - Petrol stations in an urban environment and outside of it, info-centres. - Sound insulation of street noise and traffic corridors. - Arranging public zones outside an urban environment, roads, bridges, tunnels and their ancillary facilities.
Student obligations	<ul style="list-style-type: none"> - Course attendance. - Visits to building-sites and theme exhibitions. - Project work: Based on the general design of a given assignment, a part of the general design and executional project for a public zone renovation should be elaborated.
Exam	<ul style="list-style-type: none"> - written exam - oral exam
Assessment	<ul style="list-style-type: none"> - Lecture and exercise attendance and project work 50% - Written and oral exam 50%
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Neufert, E.: Arhitektonsko projektiranje, IGH Zagreb 2002. 2. Magaš, O.: Skice za predavanja, skripte. 3. Production-programmes for building equipment. 4. Plans and projects of executional solutions. <p>Recommended:</p> <ol style="list-style-type: none"> 1. Kostof, S.: The City Shaped, Thames and Hudson, 1991. 2. Kostof, S.: The City Assembled, Thames and Hudson, 1992. 3. Gosling&Maitland: Concepts of Urban Design, Academy editions, London 1984.

Course:	TOURIST CONSTRUCTIONS
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Course code: OA-906	Pre-requisites:	Hours of Active Classes: 45 lectures: 30 exercises: 15 seminars: 0
Course status: mandatory	The course consists of: lectures exercises -	ECTS: 5

Course objectives	To inform students about the methodology of planning and qualify them for reading and elaborating the planning documentation.
Syllabus	<ul style="list-style-type: none"> – Free-time architecture, historical review. – Sustainable development as the future of tourist development. Original tourist product - imperative of a modern tourist offer. – From a regional plan to an executional project. – Rural tourism, cottage industry, building heritage renovation. – Specific quality of a locality, seashore, hinterland, winter sports. – Suite tourism, suite hotels. – Tourist hotels, tourist complexes, categorization. – Tourist hotel chains, norm. – Excursion tourism, ancillary facilities.
Student obligations	<ul style="list-style-type: none"> – Course attendance – Visits to building-sites and theme exhibitions – Project work: Based on the assigned general design, a part of the executional project of a block of flats should be elaborated with all the relevant details solved on the Final Year Project course.
Exam	<ul style="list-style-type: none"> – written exam – oral exam
Assessment	<ul style="list-style-type: none"> – Lecture and exercise attendance and project work 50% – Written and oral exam 50%
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Neufert, E.: Arhitektonsko projektiranje, IGH Zagreb 2002. 2. Magaš, O.: Skice za predavanja, skripte 3. Production-programmes for building equipment 4. Plans and projects of executional solutions <p>Recommended:</p>

Course:	ARCHITECTURAL HERITAGE RENEWAL
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Course code: OA-907	Pre-requisites:	Hours of Active Classes: 45 lectures: 30 exercises: 0 seminars: 15
Course status: optional	The course consists of: lectures - seminars	ECTS: 5

Course objectives	To learn fundamental principles of renewal of architectural heritage.
Syllabus	<ol style="list-style-type: none"> 1. History of architecture 2. History of constructions 3. Measuring and taking photographs in architecture 4. Reconstruction of walls 5. Reconstructions of floors and roofs 6. Reconstruction of foundations 7. Techniques of architectural presentations
Student obligations	Attendance at the course has to be in accordance with the Faculty regulations.
Exam	written and/or oral exam
Assessment	15% attendance, 25% practical work, 60 % exam
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Tomislav Marasović, Aktivna zaštita, Split, Sveučilište u Splitu, 1988. 2. Jerko Marasović, Tehnike mjerenja, Split (skripta), Arhit.fakultet Zagreb, 1988. <p>Recommended:</p>

Course:	TRANSPORT INFRASTRUCTURE
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Course code: P-960	Pre-requisites:	Hours of Active Classes: 45 lectures: 30 exercises: 15 seminars: 0
Course status: mandatory	The course consists of: lectures exercises -	ECTS: 4

Course objectives	The objective of this course is to educate students-engineers to understand and participate in the process of planning, building and maintaining the transport infrastructure. The student should be able to work in the field of road infrastructure management with respect to the principles of environmental protection and economical solutions.
Syllabus	<ul style="list-style-type: none"> – Transport infrastructure elements: roads, parking facilities, traffic buildings – Local, regional and state agencies for traffic infrastructure – Urban roads and intersections: types, basic characteristics – Traffic structures: parking facilities, terminals – Road pavement structures: calculation methods, materials for the construction of pavements – Infrastructure monitoring, evaluation and maintenance – Road maintenance: asphalt pavement maintenance, maintenance of drainage facilities, maintenance of signalisation facilities etc. – Maintenance of traffic structures
Student obligations	– accepted project work until specified date, oral preliminary exam
Exam	<ul style="list-style-type: none"> – written and oral exam – a positively marked written exam is a condition for the oral exam
Assessment	30% project work+50% written exam+20% oral exam
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Skripta s predavanja (odabrani članci, propisi i poglavlja iz strane literature) 2. Sršen, M.: Uvođenje suvremenih mjernih uređaja u ocjenjivanje stanja cesta - hrvatska i međunarodna iskustva, Građevni godišnjak, HSGI, Zagreb, 1999 3. Babić B.: Projektiranje kolničkih konstrukcija, Hrvatsko društvo građevinskih inženjera, Zagreb, 1997 4. Benigar, M.: Prometne zgrade – Prometno-funkcionalni temeljni principi planiranja i projektiranja; Suvremeni promet Časopis HZDP, god. 22 (2002) Br. 6 (458-464) 5. Benigar, M., Deluka-Tibljaš, A.: Garažno-parkirni objekti – Temeljni principi planiranja i prometni zahtjevi projektiranja; Suvremeni promet, Časopis HZDP, god. 23 (2003) Br.3-4 (204-210) 6. Sršen, M.: Road Maintenance (orig. in Croatian), Građevni godišnjak, HSGI, Zagreb, 2000 <p>Recommended:</p> <ol style="list-style-type: none"> 1. Božičević, J., Infrastruktura cestovnog prometa I i II, Fakultet prometnih znanosti, Zagreb, 1996. 2. Korlaet, Ž.: Uvod u projektiranje i građenje cesta; Građevinski fakultet Sveučilišta u Zagrebu, 1995. 3. A guide for hiring and managing advisors for private participation in infrastructure : toolkit / [leaders of the project Jordan Schwartz and Chiaki Yamamoto], World Bank, Washington DC, 2001.

Course:	HYDRAULIC STRUCTURES IN URBAN AREAS
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Course code: H-820	Pre-requisites:	Hours of Active Classes: 60 lectures: 30 exercises: 15 seminars: 15
Course status: mandatory	The course consists of: lectures exercises seminars	ECTS: 5

Course objectives	<ul style="list-style-type: none"> – Introducing students to the role and functions of hydraulic structures in urban areas. – Develop students' skills for hydraulic structures management and maintenance in urban areas.
Syllabus	<ul style="list-style-type: none"> – Types of hydraulic structures in urban areas. – Municipal infrastructure water systems - water supply systems, drainage and sewage systems. – Waterways in urban areas - regulatory structures for flood protection (walls, dykes, maintenance of river beds, ecorimediatory actions, etc.) – Functional analysis of retentions and relieve structures for rainwater drainage. – Conserving and protecting water sources in urban areas. Sanitary protection zones for sources and recovery planning inside them. – Management and maintenance of water supply systems. Water reservoirs, tanks and pumping stations. – Management and maintenance of sewage systems. – Telemetric systems. – Coastal and port structures. Construction, maintenance and reconstruction. – Ground water influence on underground structures. Planning and construction.
Student obligations	<ul style="list-style-type: none"> – Course attendance in accordance with the Faculty regulations. – Writing and presenting a paper.
Exam	<ul style="list-style-type: none"> – A positively marked written exam is a condition for the oral exam.
Assessment	<ul style="list-style-type: none"> – Writing and presenting a paper 30%, exam 70%.
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Vuković, Ž.: Osnove hidrotehnike (drugi dio, knjiga druga). Akvamarine, Zagreb, 1996. 2. Margeta, J.: Kanalizacija naselja. GF u Splitu, GF u Osijeku i IGH, Split i Osijek, 1998. <p>Recommended:</p> <ol style="list-style-type: none"> 1. Chin, D.A.: Water - Resources Engineering. Prentice Hall, New Jersey, 2000. 2. PAP: Planning and designing of Urban Waste water Treatment Projects in Mediteranean Coastal Towns, Split, 1992.

Course:	INVESTMENT POLICY
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Course code: OA-912	Pre-requisites:	Hours of Active Classes: 45 lectures: 30 exercises: 15 seminars: 0
Course status: optional	The course consists of: lectures exercises -	ECTS: 4

Course objectives	The objective of this course is to acquire basic knowledge from the area of company investment policy.
Syllabus	<ol style="list-style-type: none"> 1. Company investment policy 2. Investment program, factors and analysis of conditions 3. Investment decision 4. Financing sources 5. Investment dynamics 6. Cost analysis 7. Calculations in market business. Relation between calculation and risk in the processes of construction. 8. Cost planning. Cost control. 9. Investment efficiency. Investment project evaluation. 10. Cost-benefit analysis.
Student obligations	<ul style="list-style-type: none"> – attendance at the course according to the Faculty regulations – active participation in lectures and exercises – producing an autonomous work as a pre-requisite for taking the exam
Exam	written/oral exam
Assessment	attendance at the course 30 %, active participation on course 20 %, oral exam 20 %, practical work 30 %
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Žaja, M., Investicijska politika I, Fakultet građevinskih znanosti, Zagreb, 1991. 2. Bendeković, J., Planiranje investicijskih projekata, knjiga I-IV, Ekonomski institut, Zagreb, 1993. 3. Lončarić, R., Organizacija izvedbe graditeljskih projekata, HGDI, Zagreb, 1995. <p>Recommended:</p> <ol style="list-style-type: none"> 1. Skendrović, V., Izvođenje investicijskih radova u inozemstvu, Građevinski institut, Zagreb, 1983. 2. Francis, J.C., Investment, Analysis and Management, McGraw-Hill International Editions, New York, , 1987.

Course:	EQUIPMENT FOR URBAN SPACES
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Course code: OA-905	Pre-requisites:	Hours of Active Classes: 30 lectures: 20 exercises: 10 seminars: 0
Course status: optional	The course consists of: lectures exercises -	ECTS: 3

Course objectives	To learn the fundamental principles of urban equipment and urban equipment design
Syllabus	<ol style="list-style-type: none"> 1. Elements of urban design 2. Anthropological measurements 3. Positioning of elements of urban design 4. Architectural obstacles 5. Materials for urban design 6. Projects of elements
Student obligations	Attendance at the course has to be in accordance with the Faculty regulations.
Exam	Written and/or oral exam
Assessment	15% attendance, 25% practical work, 60 % exam
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. E. Neufert: Arhitektonsko projektiranje, IGH Zagreb 2002. 2. Neufer : Arhitektonske mjere 3. Antropološke mjere i interieur 4. Pravilnik o sprečavanju arhitektonskih barijera <p>Recommended:</p>

Course:	WASTE AND WASTE WATER MANAGEMENT
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Course code: H-821	Pre-requisites:	Hours of Active Classes: 60 lectures: 30 exercises: 0 seminars: 30
Course status: optional	The course consists of: lectures - seminars	ECTS: 5

Course objectives	<ul style="list-style-type: none"> – Providing basic knowledge about karst surroundings and patterns of the appearance and movements of water in them. Development of capabilities for the recognition of particularities of water management characteristics in the karst – Qualifying students for solving basic tasks from the domain of planning and utilising water from the karst autonomously
Syllabus	<ul style="list-style-type: none"> – Waste-waters – balancing and characteristics – Plants for cleansing communal waste-waters – procedures, functional parts and management – Plants for mud from waste-water treatment – procedures, functional parts and management – Independent plants for waste-water cleansing from smaller settlements and buildings– classical approach and alternative approaches – Types and characteristics of waste materials – Solid municipal waste. Building material waste. Collecting and transport of the waste – Selecting and processing the waste. Recycling from the waste – Sanitary waste depots. Organisation and management – Laws and regulations from the domain of waste and waste-water management
Student obligations	<ul style="list-style-type: none"> – Attendance at lectures and exercises as defined by the Faculty regulations. – Attendance at the field courses. – Preparing and delivering a paper from seminars.
Exam	A pass in the written part is a condition for the oral part of the exam
Assessment	30% program 70% exam
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Margeta, J.: Kruti otpad, Građevinski fakultet Split, 1988. 2. Wilson, D.G.: Handbook of Solid Waste Management, Van Nostrand, New York, 1977. 3. Tedeschi, S.: Zaštita voda. HDGI, Zagreb, 1997. 4. Margeta, J.: Kanalizacija naselja; Građevinski fakultet u Splitu, Građevinski fakultet u Osijeku i Institut građevinarstva Hrvatske, Split i Osijek, 1998. 5. Tedeschi, S.: Zaštita vodnih sustava i pročišćavanje otpadnih voda, Građevinski institut, Zagreb, 1983. <p>Recommended:</p> <ol style="list-style-type: none"> 1. Vuković, Ž.: Osnove hidrotehnike (prvi dio, druga knjiga), Akvamarine, Zagreb, 1996. 2. Margeta, J.: Dispozicija krutih otpadaka. U: Zaštita vodnih sustava i pročišćavanje otpadnih voda (ed.: Tedeschi, S.). Građevinski institut, Zagreb, 1983. 3. Zrnić, P.: Evakuacija otpada i smeća. Građevinska knjiga, Beograd, 1969.

Course:	WATER SUPPLY AND SEWERAGE
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Course code: H-825	Pre-requisites:	Hours of Active Classes: 60 lectures: 30 exercises: 30 seminars: 0
Course status: optional	The course consists of: lectures exercises -	ECTS: 5

Course objectives	<ul style="list-style-type: none"> - To help students acquire the basic elements of water supply and sewage systems and their construction. - To qualify students to perform elementary tasks and to elaborate project parts in the field of water supply and sewage systems autonomously.
Syllabus	<p>Water sources in nature. Types of water supply systems. Basics of water supply system design. Structures in water supply systems: catchment structures, water treatment plants, water reservoirs and tanks, pumping stations, pipelines (pipes, fittings, valves) etc. Drinking water quality. Construction and hydrostatic testing of water supply systems. Water supply in a state of emergency.</p> <p>Types of wastewater. Types of sewerage systems. Basics of sewerage system design.</p> <p>Types of sewers. Testing the water tightness of sewers. Structures in sewerage systems: retention reservoirs, wastewater treatment plants, revision shafts, cascade shafts, overflow structures etc. Wastewater disposal.</p>
Student obligations	<ul style="list-style-type: none"> - Course attendance in accordance with the Faculty regulations. - Completed project work before the end of the term.
Exam	Written exam.
Assessment	Preliminary exams (70%), written exam (30%).
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Vuković, Ž.: Osnove hidrotehnike (prvi dio, druga knjiga), Akvamarine, Zagreb, 1996. 2. Karleuša, B.: Materijal s predavanja (dostupno na web-stranici kolegija) <p>Recommended:</p> <ol style="list-style-type: none"> 1. Gulić, I.: Opskrba vodom, HSGI, Zagreb, 2000. 2. Gulić, I.: Kondicioniranje vode, HSGI, Zagreb, 2003. 3. Margeta, J.: Kanalizacija naselja; GF u Splitu, GF u Osijeku i IGH, Split i Osijek, 1998. 4. Tedeschi, S.: Zaštita voda, HDGI, Zagreb 1997.

Course:	COASTAL STRUCTURES
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Course code: H-826	Pre-requisites:	Hours of Active Classes: 60 lectures: 30 exercises: 30 seminars: 0
Course status: optional	The course consists of: lectures exercises -	ECTS: 5

Course objectives	To develop specific competences (knowledge and skills) in the construction of coastal structures, determining the design conditions, geotechnical aspects of construction in the coastal zone, dynamic impacts of waves on coastal and off-shore structures, structured coastal structures, properties and behaviour of building materials exposed to sea conditions.
Syllabus	<p>Statistical methods in coastal engineering</p> <p>Foundations, consolidation and settlement in the coastal zone</p> <p>Natural sediment scour and structure-induced sediment scour</p> <p>Dynamic impact of waves on vertical walls, piles and plates in the sea</p> <p>Elastic submarine sea lines (pipelines) - design</p> <p>Structured coastal structures - design</p> <p>Properties and behaviour of building materials exposed to sea conditions</p>
Student obligations	course attendance, exercise/project work preparation, seminar work preparation
Exam	Written exam.
Assessment	Preliminary exams (70%), written exam (30%).
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Tadejević Z.: Pršić M.: "Pomorska hidraulika - I dio", GF Zagreb, 1981. 2. Soren, Kolhase. "Oceanografske i pomorsko-građevne osnove projektiranja luka", skripta 3. Kirinčić, J.: "Luke i terminali", Školska knjiga, Zagreb, 1991. 4. USACE Engineering manuals http://www.usace.army.mil/inet/usace-docs/eng-manuals/em.htm. <p>Recommended:</p> <ol style="list-style-type: none"> 1. Per Bruun: "Port Engineering", 1981. 2. Abbot, M.B. & Price, W.A.: "Coastal, Estuarial and Harbour Engineer's Reference Book", 1994.

Course:	INTRODUCTION TO URBAN ROADS AND INTERSECTIONS
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Course code: P-962	Pre-requisites:	Hours of Active Classes: 45 lectures: 30 exercises: 15 seminars: 0
Course status: optional	The course consists of: lectures exercises -	ECTS: 5

Course objectives	The student is qualified to participate in the elaboration of a project of urban roads and their maintenance. He is expected to become familiar with the basic elements of urban road infrastructure.
Syllabus	<ul style="list-style-type: none"> - Introduction to the main properties of the traffic regime in the city - Urban roads: their function and classification - Basic geometric elements of the horizontal and vertical alignment of urban roads - Peculiarities of urban roads: communal facilities, pedestrian area, public lighting, drainage - Main characteristics of urban intersections - Capacity of urban roads and intersections - Parking types, parking areas - Garage and parking facilities, types - Public transportation: function and properties
Student obligations	- accepted project work (group work) and presentation of the project before the end of term or before a specified date, preliminary oral exam
Exam	- written exam, oral exam
Assessment	Preliminary exams (70%), written exam (30%).
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Cerovac, V.: Tehnika i sigurnost prometa; Sveučilište u Zagrebu - Fakultet prometnih znanosti, Zagreb 2001. 2. Suvremeni promet, Časopis Hrvatskog znanstvenog društva za promet 3. Studija Riječkih prometnih prostora, IGH Rijeka, 1990. <p>Recommended:</p> <ol style="list-style-type: none"> 1. Maletin, M.: Gradske saobraćajnice, 2. Ceste i mostovi, Časopis Društva za ceste Via Vita 3. Kolenc, J.: Infrastruktura cestnega prometa, Univerza v Ljubljani, Fakulteta za pomorstvo in promet, Portorož 1997. 4. Tollazzi, T.: Krožna križišća, Univerza v Mariboru, Maribor 2002.

Course:	INTRODUCTION TO DESIGN II
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Course code: OA-913	Pre-requisites:	Hours of Active Classes: 60 lectures: 30 exercises: 30 seminars: 0
Course status: optional	The course consists of: lectures exercises -	ECTS: 5,5

Course objectives	To inform students about the methodology of planning and qualify them for reading and elaborating the planning documentation.
Syllabus	<ul style="list-style-type: none"> - Basic characteristics of public buildings, function, construction, design for business buildings. - Function, construction, design for day-nursery, school, commercial and catering buildings. - Shared spaces in residential and public buildings, repositories, utilities, waste-rooms, boiler-rooms. - Heating, cooling and ventilation, heating-units and other armatures. - Staircases and elevators, dimensioning, material, construction, design. - Parking areas in individual and collective garages, dual-purpose shelters. - Modern facades and roof frames. - Construction as the basis of formation - public buildings for special purposes, stadiums, theatres, airports. - 19th century constructions, neo-styles, new materials and engineering constructions, turn of the century. - Architecture of Modernism and its main representatives. - Postmodernism, High-tech, Deconstructivism, contemporary architecture.
Student obligations	<ul style="list-style-type: none"> - Course attendance - Visits to buildingsites and theme exhibitions - Project work: continuation of the executorial project elaboration, board plan, workshop-plans, details.
Exam	<ul style="list-style-type: none"> - written exam - oral exam
Assessment	Preliminary exams (70%), written exam (30%).
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Knežević, G., Kordiš, I.: Stambene i javne zgrade, Tehnička knjiga, Zagreb 1987. 2. Neufert, E: Elementi arhitektonskog projektiranja, Golden Marketing, Zagreb 2002. 3. Vrkljan, Z: Oprema građevnih nacrti, Zagreb 1965. 4. Palinić, N. : Osnove projektiranja I, skripta (u izradi) <p>Recommended:</p> <ol style="list-style-type: none"> 1. Janson, H.W.: History of art, New York 61/02. 2. Encyclopaedia of 20th Century Architecture, Thames and Hudson 1989. 3. Pearman, H.: Contemporary world architecture, Phaidon 1998. 4. Fisher, R.: New Structures, New York, London 1964. 5. Herzog, T.: Pneumatic Structures, C.I.Staples, London 1977. 6. Milić, B.: Razvoj grada kroz stoljeća, I, II, III, Školska knjiga, Zagreb 90/04 7. Tonković, I.: Priča o građenju, Tehnička knjiga, Zagreb 8. MGR: Arhitektura Rijeke, Moderna, Secesija, Historicismizam, 96-01.

Course:	TRAFFIC, SPACE AND ENVIRONMENT
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Course code: P-914	Pre-requisites:	Hours of Active Classes: 45 lectures: 30 exercises: 0 seminars: 15
Course status: optional	The course consists of: lectures - seminars	ECTS: 4

Course objectives	To introduce students to the essential aspects of the various and complex influences between transport infrastructure, space, and environmental impacts. Furthermore, students should be able to objectively evaluate the different starting points and arguments in integrated decision-making process on the future spatial units, in accordance with the principles of sustainable development.
Syllabus	Plans, programs, strategic documents regarding traffic, space and environmental impact: features, types, components, development methodology, adoption and implementation. Laws, regulations (conventions), institutions (organizations), public participation and other entities in the drafting and implementation of plans and other important documents: the level of municipalities, regions, countries, international level - especially the European Union. Processing of some important topics related to the mutual impact of traffic, space and the environment: - traffic infrastructure or design of traffic networks in relation to the character and objects of spatial planning - policy instruments of spatial planning, transportation (mobility) and the impact on the environment while respecting the principles of sustainable development - economy, social and other issues. Dealing with specific thematic areas. Review and examples of using evaluation methods in the evaluation of alternatives and plans
Student obligations	The participation of students in all aspects of teaching including the preparation and presentation of a seminar paper.
Exam	The exam is written and oral.
Assessment	70% during semester, 30% final exam.
Literature	Essential: 1. Reference material made of a lecturer. - Documents and other sources and laws (international conventions) regarding transportation planning and related infrastructure, space, and sustainable development and environmental protection: - International: UN, EU, OECD and other international organizations, - On the national level (strategies, plans, status reports, etc.), - Zagreb: OG - At the level of regional and local governments (programs, plans, decisions, etc.) - Official Gazette of the county and others Recommended: 1. Our Common Future. World Commission for the Environment and Development. - N. York: UN, 1987. 2. Črnjar, M.: Ekonomija i zaštita okoliša. - Zagreb: Školska knjiga i Rijeka: Glosa, 1997. 3. Marinović-Uzelac, A.: Prostorno planiranje. - Zagreb: Dom i svijet, 2001. 4. The World in 2020. Towards a New Globale Age. – Paris: OECD, 1997. 5. Welt im Wandel: Strategien zur Bewaeltigung globaler Umweltrisiken. W. B. der B.-Regierung. Berlin: Springer, 1997. 6. Health and Environment in Suistainable Development. - World Health Organization, 1997. 7. Marinović-Uzelac, A.: Prostorno planiranje. - Zagreb: Dom i svijet, 2001.

Course:	MANAGEMENT IN CIVIL ENGINEERING
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Course code: OA-963	Pre-requisites:	Hours of Active Classes: 45 lectures: 45 exercises: 0 seminars: 0
Course status: mandatory	The course consists of: lectures - -	ECTS: 4

Course objectives	The main objective of course is acquiring basic knowledge of civil engineering companies business.
Syllabus	<ol style="list-style-type: none"> 1) Company concept, types and objects 2) Investment characteristics and elements 3) Building companies reproduction process results 4) Production capacity economy. Costs. 5) General management thesis 6) Management role and significance in building companies business 7) Company business policy forming 8) Basis of market business. Law of supply and demand 9) Products planning and developing 10) Prices policy 11) Elasticity in consumption 12) Business decision making. Methods of decision making
Student obligations	Attendance to the course according to the Faculty regulations Activity in class.
Exam	Written and oral exam.
Assessment ⁽¹⁾	Preliminary exams, seminars (70%), written exam (30%).
Literature	<p>Essential:</p> <ol style="list-style-type: none"> 1. Katavić, M., Hamarić, S., Poslovna politika, Sveučilište u Zagrebu, Građevinski institut, Zagreb, 1989. 2. Buble, M.: Osnove menadžmenta, Sinergija nakladništvo, Zagreb, 2006. 3. Buble, M. i ost.: Strateški management, Sinergija d.o.o., Zagreb, 2005. 4. Wehrich, H., Koontz, H.: Menadžment, Mate, Zagreb, 1993. 5. Žaja, M., Ekonomika proizvodnje, Školska knjiga, Zagreb, 1992. <p>Recommended:</p> <ol style="list-style-type: none"> 1. Dujanić, M.: Osnove menadžmenta, Ekonomski fakultet, Rijeka, 2007. 2. Dujanić, M.: Menadžment, Ekonomski fakultet, Rijeka, 2007. 3. Drucker, P.: Najvažnije o menadžmentu, M.E.P.Consult, Zagreb 2005. 4. Miles, R.E., Theories of Management, McGraw - Hill, 1975. 5. Sikavica, P Bahtijarević-Šiber F.: Menadžment – teorija menadžmenta i veliko empirijsko istraživanje u Hrvatskoj, Masmedia, Zagreb, 2004. 6. Wagner, H.M., Principles of Management Science, Eaglewood Cliffs, N.J., Prentice-Hall, 1975.

3.2.2. Explanation of ETCS credits

The number of hours of active classes for all the proposed courses has been calculated on the basis of the assumed average duration of one term of 15 (fifteen) weeks (the average duration of the academic year is 30 weeks). The programme includes three regular examination periods of 4 (four) weeks each.

The proposed duration of the academic year is a total of 42 working weeks : 2x15 weeks of classes and 3x4 weeks of examination periods.

During the academic year the student gains a minimum of 60 ECTS credits for all the proposed programmes.

In view of the above mentioned, the calculation of the number of hours that make one ECTS credit would be: 1 ECTS = 42 (weeks) X 40 (working hours per week) / 60 ECTS = 1.680 hours / 60 ECTS = 28 hours.

1 ECTS CREDIT is equivalent to 28 hours of the student's study load

The number of ECTS credits allocated to the particular courses has been calculated on the basis of the complexity of the course teaching material (syllabus) and the general and specific obligations the student has to fulfil in connection with the course:

- the general obligations include an estimate of: the time needed to attend classes, tutorials, prepare exams, take exams, as well as of the quantity of literature he uses to prepare the exam.
- specific obligations include an estimate of the time needed for: preliminary exams, project work, seminar work, laboratory practice, fieldwork, visiting construction sites etc.

The course load coefficient is determined in proportion to the course share in the workload of the particular term so that the student gains 30 ECTS credits per term.

3.2.2.1. Explanation fo ECTS credits by courses

	Course Code	COURSE	Active class	Programmes/ Laboratory and practical work	Seminars	Pre- exams	Exam	Total ECTS
1.	OA-915	Civil Engineering Regulations	1,5		0,5	0,5	1,5	4
2.	H-824	Natural Basis of Water Occurrence in Littoral	1,5		1,5		2,0	5
3.	OA-900	Planning of Infrastructure Systems	2	1	1		2	6
4.	P-961	GIS and Municipal Database	2,5	2			2,5	7
5.	OA-901	Public Buildings and Spaces	2	2			2	6
6.	OA-906	Tourist Constructions	2	1			2	5
7.	OA-907	Architectural Heritage Renewal	1,5	1			1,5	4
8.	P-960	Transport Infrastructure	1,5	1			1,5	4
9.	H-820	Hydraulic Structures in Urban Areas	1,5	1	1		1,5	5
10.	OA-912	Investment Policy	1,5	1			1,5	4
11.	OA-905	Equipment for Urban Spaces	1,5	0,5			1	3
12.	OA-904	Building Maintenance	1,5	1,5			2	5
13.	H-821	Waste and Waste Water Management	1,5		1,5		2	5
14.	H-823	Construction of Marinas and Ports	1,5	1,5			2	5
15.	H-822	Water-course Restoration	1,5		0,5		1	3
16.	H-825	Water Supply and Sewerage	2	1			2	5
17.	H-826	Coastal Structures	2	1			2	5

<i>Redni broj</i>	<i>Oznaka</i>	<i>POPIS PREDMETA</i>	<i>Aktivna nastava</i>	<i>Program(i)/ Laboratorijske vježbe Praktični rad</i>	<i>Seminarski rad(ovi)</i>	<i>Kolo- kvij (i)</i>	<i>Ispit</i>	<i>Ukupno ECTS</i>
18.	P-962	Introduction to Urban Roads and Intersections	1,5	1,5			2	5
19.	OA-913	Introduction to Design II	2	2			1	5
20.	P-914	Traffic, Space and Environment	1,5		1		1,5	4
21.	OA-457	Management in Civil Engineering	1		1		1	3
22.		Final Year Specialisation Project		0-5	2-13		2	15

3.2.3. Quality assurance procedures and course (module) performance indicators

The performance of all the courses will be continuously monitored by different procedures of evaluation and self-evaluation of teachers and students.

The evaluation of the teachers and teaching activities will be carried out by the course lecturers (teachers) and will be organized by the Faculty body responsible for monitoring and identifying actions needed for the improvement of the programme quality.

Different procedures and methods for monitoring and evaluating the quality of the teaching activities and the course performance will be used:

- conducting research and opinion polls among students on all the aspects of teaching:
 - regular course delivery and organization of the teaching process
 - literature
 - methods for improvement of teaching
 - exams
 - syllabus and methodology of delivery
 - student / teacher relations and collaboration
 - work load – ETCS CREDITS

- publishing the results of research and opinion polls
- analysing the exam results (pass rate, transparency, objectivity and the like).

The teaching performance quality performance of the courses concerned will be evaluated twice during the term: for the first time 3-4 weeks after the beginning of the classes and for the second time during the last week the classes are taken. The results of the first evaluation may improve the teaching activities in the current term.

All research and opinion polls will be conducted on forms prepared in advance, in which the teachers will be able to adapt the questions to the course curriculum, methodology and other specific demands that the course has to meet. The course lecturer will, independently and/or in coordination with the responsible persons at the Faculty, work out the plan of measures for better learning results in the courses concerne

3.3. STUDY PROGRAMME STRUCTURE

I semester

	Course Code	Mandatory Courses	Hours of Active Classes (L+E+S)	ECTS
1.	OA-915	Civil Engineering Regulations	30+0+0	4
2.	H-824	Natural Basis of Water Occurrence in Littoral	30+0+15	5
3.	OA-900	Planning of Infrastructure Systems	45+0+15	6
		OPTIONAL COURSES		15
		TOTAL		30

	Course Code	Optional Courses	Hours of Active Classes (L+E+S)	ECTS
4.	H-825	Water Supply and Sewerage	30+30+0	5
5.	H-826	Coastal Structures	30+30+0	5
6.	P-962	Introduction to Urban Roads and Intersections	30+15+0	5
7.	OA-913	Introduction to Design II	30+30+0	5

II semester:

	Course Code	Mandatory Courses	Hours of Active Classes (L+E+S)	ECTS
1.	P-961	GIS and Municipal Database	30+45+0	7
2.	OA-901	Public Buildings and Spaces	30+30+0	6
3.	OA-906	Tourist Constructions	30+15+0	5
		OPTIONAL COURSES		12
		TOTAL		30

	Course Code	Optional Courses	Hours of Active Classes (L+E+S)	ECTS
4.	OA-912	Investment Policy	30+15+0	4
5.	OA-914	Management in Civil Engineering	45+0+0	4
6.	P-963	Traffic, Space and Environment	30+0+15	4
7.	OA-907	Architectural Heritage Renewal	30+0+15	4
8.	P-960	Transport Infrastructure	30+15+0	4
9.	H-820	Hydraulic Structures in Urban Areas	30+15+15	5

III semester:

	Course Code	Mandatory Courses	Hours of Active Classes (L+E+S)	ECTS
1.		Final Year Specialisation Project	0+0+60	15
		OPTIONAL COURSES		15
		TOTAL		30

	Course Code	Optional Courses	Hours of Active Classes (L+E+S)	ECTS
2.	H-822	Water-course Restoration	20+10+0	3
3.	OA-904	Building Maintenance	30+15+0	5
4.	H-823	Construction of Marinas and Ports	30+30+0	5
5.	H-821	Waste and Waste Water Management	30+0+30	5
6.	OA-905	Equipment for Urban Spaces	20+10+0	3