



## THE PROGRAM OF THE GRADUATE STUDY OF CIVIL ENGINEERING

The graduate study of Civil Engineering at the Faculty of Civil Engineering, Architecture and Geodesy lasts two academic years and is organised in four semesters.

The syllabus (curriculum) consists of compulsory, elective and extracurricular courses. It is aligned with European Credit Transfer and Accumulation System (ECTS) of the European Higher Education Area (EHEA) and students accumulate minimum of 60 ECTS each academic year. In order to obtain qualification (bachelor degree, first cycle) students have to accumulate minimum of 120 ECTS.

The courses of the graduate study of Civil Engineering are organised in four specialisations:

- General,
- Modelling of Structures,
- Structural Engineering,
- Hydrotechnical Engineering.

Upon completion students are awarded the academic title and corresponding qualification magistar/magistra inženjer/inženjerka građevinarstva (University Master of Science in Civil Engineering). Students may continue their studies at postgraduate university study in civil engineering or similar engineering fields, or enter the labour market.

## Syllabus

The tables below show information for the actual (spring) and former (autumn) semester. Detail plans for specific semesters and academic years are published on following Faculty's web site: [this link](#).

[General](#), [Modelling of structures](#), [Structural engineering](#) and [Hydrotechnical engineering](#).

### General

Teacher	Course	Related learning outcomes	Teaching and learning	Assessment	Code	Hours	ECTS
<b>I. semestar</b>							
S. Ivelić Bradanović	<a href="#">Applied Mathematics</a>	a,h,k	1,2,3	1,2	GAB701	30+30	5,0
J. Radnić, A. Harapin	<a href="#">Concrete Structures I</a>	j,m	1,2,3,4	1,2,3	GAE701	30+30	5,0
A. Mihanović, Ž. Nikolić	<a href="#">Dynamics of Structures and Earthquake Engineering</a>	a,c,j,k,p,t	1,2,3	1,2,3	GAO701	30+15	4,0
P. Mišević	<a href="#">Geotechnical Engineering</a>	a,d,e,j	1,2,3,4,5,6	1,2	GAG703	30+30	5,0
D. Bojanić	<a href="#">Hydraulics</a>	a,b,f,h	1,2,3	1,2	GAH701	45+30	6,0
D. Breški, D. Cvitanić	<a href="#">Pavement Structures</a>	b,c,n	1,2,3	1,2	GAF701	30+30	5,0
<b>II. semestar</b>							
J. Margeta	<a href="#">Hydrotechnical Systems</a>	b,c,g,i	1,2,3	1,2,3	GAJ701	30+30	5,0
V. Denić-Jukić, D. Jukić	<a href="#">Engineering Hydrology</a>	a,d,h,i	1,2,3	1,2,3	GAI701	30+30	5,0
V. Srzić	<a href="#">Coastal Engineering</a>	a,f,k	1,2,5	1,2	GAK701	30+30	5,0
D. Breški, D. Cvitanić	<a href="#">Traffic Engineering</a>	b,c,n	1,2,3	1,2,3	GAF702	30+30	5,0
P. Mišević	<a href="#">Rock Mechanics</a>	a,d,e,j	1,2,3,4,5	1,2,3	GAG701	30+30	5,0
S. Knezić	<a href="#">Operational Research in Civil Engineering</a>	b,c,d,r,s	1,2,3	1,2,3	GAL701	30+30	5,0
<b>III. semestar</b>							
R. Andričević	<a href="#">Hydropower Engineering</a>	b,c,f,g,i	1,2	1,2	GAK801	30+30	5,0
N. Jajac	<a href="#">Business and Investments in Civil Engineering</a>	b,c,r,s	1,2,3	1,2	GAL702	30+30	5,0
	Elective Courses – dogovor s mentorom						15,0
	Elective Courses – slobodan izbor						5,0
<b>IV. semestar</b>							
	Diplomski rad	b,c,d,t	7	3	GAX801		30,0

## Modelling of Structures

Teacher	Course	Related learning outcomes	Teaching and learning	Assessment	Code	Hours	ECTS
<b>I. semestar</b>							
S. Ivelić Bradanović	<a href="#">Applied Mathematics</a>	a,h,k	1,2,3	1,2	GAB701	30+30	5,0
J. Radnić, A. Harapin	<a href="#">Concrete Structures I</a>	j,m	1,2,3,4	1,2,3	GAE701	30+30	5,0
A. Mihanović, Ž. Nikolić	<a href="#">Dynamics of Structures and Earthquake Engineering</a>	a,c,j,k,p,t	1,2,3	1,2,3	GAO701	30+15	4,0
P. Mišćević	<a href="#">Geotechnical Engineering</a>	a,d,e,j	1,2,3,4,5,6	1,2	GAG703	30+30	5,0
A. Munjiza	<a href="#">Stability of Structures</a>	a,j,l,t	1,2	1,2,3	GAO702	30+30	5,0
I. Boko	<a href="#">Metal Structures I</a>	j,k,m	1,2,3,4	1,3	GAP701	45+30	6,0
<b>II. semestar</b>							
J. Radnić, B. Trogrlić	<a href="#">Masonry Structures</a>	b,j,k,m	1,2,3,4	1,2	GAE702	30+30	5,0
B. Gotovac, V. Kozulić	<a href="#">Mechanics of Deformable Bodies</a>	a,c,k,o,p,t	1,2,3	1,2,3	GAD701	30+30	5,0
B. Gotovac, V. Kozulić	<a href="#">Surface Structures</a>	a,l,o,p,t	1,2,3,4	1,2,3	GAD702	30+30	5,0
P. Marović, M. Galić	<a href="#">Mechanics of Materials</a>	a,c,k,o,p,t	1,2,5	1	GAR701	30+30	5,0
A. Mihanović, B. Trogrlić	<a href="#">Nonlinear Building Statics</a>	a,j,k,l,o	1,2,3	1,3	GAO703	30+30	5,0
Ž. Nikolić, A. Mihanović	<a href="#">Dynamic Models of Earthquake Engineering</a>	a,o,p,t	1,2,3	1,2,3	GAO704	30+30	5,0
<b>III. semestar</b>							
N. Jajac	<a href="#">Business and Investments in Civil Engineering</a>	b,c,r,s	1,2,3	1,2	GAL702	30+30	5,0
P. Marović	<a href="#">Testing of Structures</a>	b,l,m	1,5	1	GAR702	30+30	5,0
	Elective Courses – dogovor s mentorom						15,0
	Elective Courses – slobodan izbor						5,0
<b>IV. semestar</b>							
	Diplomski rad	b,c,d,t	7	3	GAX801		30,0

## Structural Engineering

Teacher	Course	Related learning outcomes	Teaching and learning	Assessment Code	Hours	ECTS
<b>I. semestar</b>						
S. Ivelić Bradanović	<a href="#">Applied Mathematics</a>	a,h,k	1,2,3	1,2	GAB701	30+30 5,0
J. Radnić, A. Harapin	<a href="#">Concrete Structures I</a>	j,m	1,2,3,4	1,2,3	GAE701	30+30 5,0
A. Mihanović, Ž. Nikolić	<a href="#">Dynamics of Structures and Earthquake Engineering</a>	a,c,j,k,p,t	1,2,3	1,2,3	GAO701	30+15 4,0
P. Mišćević	<a href="#">Geotechnical Engineering</a>	a,d,e,j	1,2,3,4,5,6	1,2	GAG703	30+30 5,0
A. Munjiza	<a href="#">Stability of Structures</a>	a,j,l,t	1,2	1,2,3	GAO702	30+30 5,0
I. Boko	<a href="#">Metal Structures I</a>	j,k,m	1,2,3,4	1,3	GAP701	45+30 6,0
<b>II. semestar</b>						
J. Radnić, B. Trogrlić	<a href="#">Masonry Structures</a>	b,j,k,m	1,2,3,4	1,2	GAE702	30+30 5,0
J. Radnić, D. Matešan	<a href="#">Prestressed Concrete</a>	b,j,k,l,m	1,2,3,4	1,2	GAE703	30+30 5,0
J. Radnić, A. Harapin	<a href="#">Concrete Structures II</a>	a,j,k,l,m	1,2,3,4	1,2	GAE704	30+30 5,0
I. Boko	<a href="#">Metal Structures II</a>	a,j,k,l,m	1,2,3,4	1,3	GAP702	30+30 5,0
V. Divić	<a href="#">Reliability of Structures</a>	a,b,l	1,2,3,4	1,3	GAP703	30+30 5,0
	Izborni predmet					5,0
<b>III. semestar</b>						
N. Jajac	<a href="#">Business and Investments in Civil Engineering</a>	b,c,r,s	1,2,3	1,2	GAL702	30+30 5,0
J. Radnić, D. Matešan	<a href="#">Concrete Bridges</a>	c,j,k,l,m	1,2,3,4	1,2,3	GAE801	30+30 5,0
I. Boko, V. Divić	<a href="#">Metal Bridges</a>	c,j,k,l,m	1,3,4	1,3	GAP801	30+30 5,0
	Elective Courses - dogovor s mentorom					15,0
<b>IV. semestar</b>						
	Diplomski rad	b,c,d,t	7	3	GAX801	30,0

## Hydrotechnical Engineering

Teacher	Course	Related learning outcomes	Teaching and learning	Assessment	Code	Hours	ECTS
<b>I. semestar</b>							
S. Ivelić Bradanović	<a href="#">Applied Mathematics</a>	a,h,k	1,2,3	1,2	GAB701	30+30	5,0
J. Radnić, A. Harapin	<a href="#">Concrete Structures I</a>	j,m	1,2,3,4	1,2,3	GAE701	30+30	5,0
T. Vlahović	<a href="#">Hydrogeology</a>	b,c,d,h,i	1,2	1	GAG705	30+15	4,0
D. Bojanić	<a href="#">Hydraulics</a>	a,b,f,h	1,2,3	1,2,3	GAH701	45+30	6,0
P. Mišćević	<a href="#">Geotechnical Engineering</a>	a,d,e,j	1,2,3,4,5,6	1,2	GAG703	30+30	5,0
Elective Courses (min. 4 ECTS)							
<b>II. semestar</b>							
V. Denić-Jukić	<a href="#">Irrigation and Drainage</a>	c,f,g,i	1,2,3	1,2,3	GAI707	30+15	4,0
V. Denić-Jukić, D. Jukić	<a href="#">Engineering Hydrology</a>	a,d,h,i	1,2,3	1,2,3	GAI701	30+30	5,0
V. Srzić	<a href="#">Coastal Engineering</a>	a,f,k	1,2	1,2	GAK701	30+30	5,0
D. Jukić	<a href="#">Stream Regulation</a>	g,h,i	1,2,3	1,3	GAI704	30+30	6,0
J. Margeta	<a href="#">Protection of Water Resources, Municipalwastewater and Stormwater Treatment</a>	b,c,f,g,i	1,2,3	1,2,3	GAJ702	30+30	5,0
R. Andričević	<a href="#">Integrated Water Resources Management</a>	b,g,i,t	1,2	1,2,3	GAK804	30+30	5,0
<b>III. semestar</b>							
R. Andričević	<a href="#">Hydropower Engineering</a>	b,c,f,g,i	1,7	1,2	GAK801	30+30	5,0
H. Gotovac	<a href="#">Groundwater Flow and Solute Transport Modeling</a>	a,c,g,h,t	1,2	1,2	GAK802	30+30	5,0
Elective Courses – dogovor s mentorom							
Elective Courses – slobodan izbor							
<b>IV. semestar</b>							
Diplomski rad							
		b,c,d,t	7	3	GAX801		30,0

## Election Courses

Teacher	Course	Related learning outcomes	Teaching and learning	Assessment	Code	Hours	ECTS
V. Srzić	<a href="#">Hydraulic Structures</a>	As listed in	1,2	1,2	GAK201	30+30	5,0
R. Andričević	<a href="#">Applied Stochastic Methods</a>	the	1,2	1,2	GAK803	30+30	5,0
V. Srzić	<a href="#">Ports and Marine Structures</a>	detail plans	1,2	1,2	GAK202	30+30	5,0
N. Štambuk Cvitanović	<a href="#">Complex Foundations</a>	at the	1,2,3,4	2,3	GAG802	30+30	5,0
J. Radnić, V. Divić	<a href="#">Composite Structures</a>	Faculty's	1,2,3,4	1,2,3	GAE705	30+30	5,0
S. Juradin	<a href="#">Building Materials II</a>	web site.	1,2,5	2,3	GAN701	30+30	5,0
D. Cvitanić, D. Breški	<a href="#">Road Interchanges</a>		1,3	2,3	GAF801	30+30	5,0
D. Breški, A. Mršić Zdilar	<a href="#">English Language</a>		1,2	1,2	GAA003	30+30	5,0
A. Mihanović, B. Trogrlić	<a href="#">Building Physics</a>		1,2,3,	1,2,3	GAO706	30+30	5,0
D. Cvitanić, D. Breški	<a href="#">Urban Traffic Areas</a>		1,2,3	2,3	GAF802	30+30	5,0
D. Jukić	<a href="#">Karst Hydrology</a>		1,3	1,3	GAI703	45+30	5,5
J. Radnić	<a href="#">Construction of Engineering Structures</a>		1,2,3,4	1,2,3	GAE706	30+30	5,0
B. Gotovac	<a href="#">Construction of Historical Buildings</a>		1,2	2,3	GAD703	30+30	5,0
A. Harapin, M. Galić	<a href="#">Housing Installations</a>		1,2,3	1,3	GAM701	30+30	5,0
N. Jajac	<a href="#">Management in Civil Engineering</a>		1,2,3	1,2,3	GAL703	45+15	5,0
D. Jukić	<a href="#">Surface Water-Quality Modelling</a>		1,3	1,3	GAI706	30+30	5,0
J. Radnić, A. Harapin	<a href="#">Numerical Modelling of Concrete Structures</a>		1,2,3	2,3	GAE803	30+30	5,0
I. Boko, N. Torić	<a href="#">Advanced Timber Structures</a>		1,2,3,4	1,3	GAP704	30+30	5,0
T. Duplančić-Leder	<a href="#">Application of GIS in Water Resources Management</a>		1,3	1,2,3	GAF002	30+30	5,0
B. Trogrlić, A. Harapin	<a href="#">Design of Structures by Computer</a>		1,2,3	1,2,3	GAO705	30+30	5,0
S. Knezić	<a href="#">Decision Systems in Civil Engineering</a>		1,3	1,2,3	GAL704	45+15	5,0
J. Radnić, N. Torić	<a href="#">Durability of Structures</a>		1,2,3,4	1,2,3	GAE802	30+30	5,0
B. Gotovac	<a href="#">Tunnels and Underground Structures</a>		1,2,3	2,3	GAD704	30+30	5,0
S. Knezić	<a href="#">Project Management</a>		1,3	1,2,3	GAL705	45+15	5,0
V. Denić-Jukić	<a href="#">Urban Hydrology</a>		1,3	1,3	GAI705	30+30	5,0
P. Mišević	<a href="#">Earthworks</a>		1,2,3,5	1,3	GAG802	30+30	5,0
J. Margeta	<a href="#">Municipal Solid Waste Management</a>		1,2,3	1,2,3	GAJ703	30+30	4,5

## Learning outcomes – Graduate University Study of Civil Engineering

Label	Units of learning outcomes
a	To formulate equations of mathematical physics for engineering problems, and to solve them analytically or with numerical methods.
b	To integrate knowledge and handle complexity, and to formulate judgments with incomplete information, that include reflection on social and ethical responsibilities.
c	To apply knowledge and problem solving abilities in new environment within multidisciplinary contexts related to the field of study.
d	To clearly communicate own conclusions and develop learning skills for lifelong learning.
e	To design and perform calculation for the geotechnical structures using the ability to assess information and parameters on the properties of soil or rock mass.
f	To design hydrotechnical structures, sewage systems, stormwater sewage systems as well as hydropower and coastal structures.
g	To plan, analyse and manage hydrotechnical and hydropower object and systems.
h	To structure mathematical models in hydrology and hydraulics for the analysis of catchment's processes, as well as hydraulics characteristics of open channel flow and pressurised systems.
i	To interpret the processes in the catchment area and to model water resources systems, as well as to apply basic elements of water resources management to the catchment scale in line with EU Water Framework Directive.
j	To design reinforced concrete, metal, timber, masonry and geotechnical structures (buildings, bridges, tunnels, silos, hydrotechnical structures, dams, etc.) which are composed of different structural load bearing systems.
k	To analyse processes, structures and systems in particular fields of civil engineering by applying numerical modelling.
l	To analyse and solve problems related to the durability, stability and reliability of structures.
m	To participate in the construction of different types of structures and supervise design and construction work.
n	To determine capacity and level of service of transportation and to make decisions on conceptual solutions in transportation engineering.
o	To model and perform calculation for structures exposed to seismic load using linear and non-linear models.
p	To assess the behaviour of structure during earthquake and to design seismic resilient structures using numerical models.
r	To apply techniques of the system analysis and operation research in civil engineering.
s	To evaluate production using standard indicators, make judgement on companies based on their balance sheets and assess investments.

t	To demonstrate knowledge and understanding that is founded upon and extends and/or enhances preceding qualification's level, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context.
---	---

### Teaching and learning:

1. Lectures: teacher teaches ex-cathedra or uses advanced forms of interactive lectures.
2. Theoretical exercises: teacher demonstrates to students how to solve standard mathematical or engineering tasks.
3. Practical exercises: students solve and prepare practical assignments under supervision of teacher in standard or IT equipped classrooms.
4. Field exercises: students and teachers visit, or students perform small-scale practical work at construction sites, factories, production plants, etc.
5. Lab exercises: teacher demonstrates experiments/tasks to students, or students perform their own experiments/tasks in the laboratory under supervision of teachers and/or technicians.
6. Internship: students perform practical work at construction sites during semester or summer vacations.
7. Independent research

### Assessment:

1. Written exams: students solve tasks as paperwork or by computer in IT equipped classrooms. They may be performed throughout the semester or during the examination period.
2. Oral exams: a teacher poses questions to students in a spoken form.
3. Presentation or defence of a practical or written assignment