

Semester 1			
Undergraduate professional study in civil engineering obligatory courses			
P: Zoran Veršić P: Sanja Lađarević dipl.ing.arh. P: Iva Ževrnja predavač A: Iva Ževrnja predavač K: Iva Ževrnja predavač A: Goran Babić K: Goran Babić A: Bernarda Cesar K: Bernarda Cesar P:mr.sc. Donka Wurth v. predavač	Building elements I	ECTS:7.0	
P: Tomislav Svaguša A:mr.sc. Jure Galić predavač L:mr.sc. Jure Galić predavač A:mr.sc. Donka Wurth v. predavač L:mr.sc. Donka Wurth v. predavač			
A: Natalija Spehar viši predavač	Kinesiology Education I	ECTS:1.0	
P:dr.sc. Mandi Orlić Bachler v.pred P:mr. sc. Reni Banov dipl. ing. mat. P: Ivana Božić Dragun dipl.prof.mat. A:dr.sc. Mandi Orlić Bachler v.pred A:mr. sc. Reni Banov dipl. ing. mat. A: Ivana Božić Dragun dipl.prof.mat. A: Martina Benković	Mathematics I	ECTS:7.0	
P:dr.sc. Mirela Katić Żlepalo prof.mat. P: Ivana Božić Dragun dipl.prof.mat. A:dr.sc. Mirela Katić Żlepalo prof.mat. K:dr.sc. Mirela Katić Žlepalo prof.mat. A: Ivana Božić Dragun dipl.prof.mat. K: Ivana Božić Dragun dipl.prof.mat.	Descriptive Geometry in Civil Engineering l	ECTS:3.0	
P:dr.sc. Mandi Orlić Bachler v.pred P:dr.sc. Dalibor Gelo mag.ing.aedif. P:dr.sc. Igor Gukov , dipl.ing.građ. L:dr.sc. Igor Gukov , dipl.ing.građ. L: Ivan Volarić struč.spec.ing.aedif.	Computer Use in Civil Engineering	ECTS:2.0	
P:mr.sc. Željko Lebo v. pred. P:dr.sc. Dalibor Gelo mag.ing.aedif. A:mr.sc. Željko Lebo v. pred. K:mr.sc. Željko Lebo v. pred. A:mr.sc. Jure Galić predavač K:mr.sc. Jure Galić predavač A:dr.sc. Dalibor Gelo mag.ing.aedif. K:dr.sc. Dalibor Gelo mag.ing.aedif.	Engineering Mechanics	ECTS:6.0	



Semester 2			
Undergraduate professional study in civil engineering obligatory courses			
P: Sanja Lađarević dipl.ing.arh. P: Iva Ževrnja predavač A: Iva Ževrnja predavač K: Iva Ževrnja predavač A: Goran Babić K: Goran Babić A: Bernarda Cesar K: Bernarda Cesar	Building elements II	ECTS:5.0	
P:prof.vis.šk. Ivica Levanat P: Alemka Knapp A: Alemka Knapp L:prof.dr. Dubravko Horvat L: Diana Šaponja-Milutinović dipl.ing.fizike, pred.	Physics	ECTS:5.0	
A: Natalija Špehar viši predavač	Kinesiology Education II	ECTS:1.0	
P:mr. sc. Reni Banov dipl. ing. mat. P:dr.sc. Mandi Orlić Bachler v.pred P: Ivana Božić Dragun dipl.prof.mat. A:dr.sc. Mandi Orlić Bachler v.pred A:mr. sc. Reni Banov dipl. ing. mat. A: Ivana Božić Dragun dipl.prof.mat.	Mathematics II	ECTS:6.0	
P:dr.sc. Mirela Katić Žlepalo prof.mat. P: Ivana Božić Dragun dipl.prof.mat. A:dr.sc. Mirela Katić Žlepalo prof.mat. K:dr.sc. Mirela Katić Žlepalo prof.mat. A: Ivana Božić Dragun dipl.prof.mat. K: Ivana Božić Dragun dipl.prof.mat.	Descriptive Geometry in Civil Engineering ll	ECTS:3.0	
P:dr.sc. Tatjana Vlahović prof.v.škole A:dr.sc. Tatjana Vlahović prof.v.škole	Elementary Geology	ECTS:2.0	
P:dr.sc. Krunoslav Pavković dipl.ing.građ. P:doc. dr. sc. Dean Čizmar dipl. ing. građ. A: Šime Serdarević mag. ing. aedif. L: Šime Serdarević mag. ing. aedif.	Strength of materials	ECTS:3.0	
P:dr.sc. Dalibor Gelo mag.ing.aedif. P:mr.sc. Željko Lebo v. pred. A:mr.sc. Željko Lebo v. pred. K:mr.sc. Željko Lebo v. pred. A:mr.sc. Jure Galić predavač K:mr.sc. Jure Galić predavač A:dr.sc. Dalibor Gelo mag.ing.aedif. K:dr.sc. Dalibor Gelo mag.ing.aedif.	Construction calculation	ECTS:6.0	



Semester 3	Semester 3			
Undergraduate pr	ofessional study in civil engineering o	obligatory courses		
P:dr.sc. Igor Gukov , dipl.ing.građ. A: Dalibor Mačkić K: Dalibor Mačkić A:dr.sc. Igor Gukov , dipl.ing.građ. K:dr.sc. Igor Gukov , dipl.ing.građ.	Concrete Structures I	ECTS:5.0		
P:doc. dr. sc. Dean Čizmar dipl. ing. građ. P:prof.vis.šk. Boris Baljkas A: Šime Serdarević mag. ing. aedif. K: Šime Serdarević mag. ing. aedif. A:doc. dr. sc. Dean Čizmar dipl. ing. građ. K:doc. dr. sc. Dean Čizmar dipl. ing. građ.	Wooden Structures	ECTS:5.0		
P:prof. dr. sc. Đuro Barković dip. ing. geod. A:prof. dr. sc. Đuro Barković dip. ing. geod. K:prof. dr. sc. Đuro Barković dip. ing. geod.	Geodesy	ECTS:2.0		
A: Natalija Špehar viši predavač	Kinesiology Education III	ECTS:1.0		
P:dr.sc. Sonja Zlatović , profesor visoke škole P:mr.sc. Željko Lebo v. pred. K:dr.sc. Sonja Zlatović , profesor visoke škole L:dr.sc. Sonja Zlatović , profesor visoke škole S:dr.sc. Sonja Zlatović , profesor visoke škole K: Ivana Pavlić	Soil Mechanics	ECTS:5.0		
P:dr.sc. Mladen Petričec dipl.ing.građ. P: Ivana Bartolić , pred. A: Ivana Bartolić , pred. S: Ivana Bartolić , pred. A: Filip Kalinić mag. ing. aedif. S: Filip Kalinić mag. ing. aedif.	Introduction to Hydrology and Hydraulics	ECTS:5.0		
P:mr.sc. Lucija Bačić v.pred. A:mr.sc. Lucija Bačić v.pred. S:mr.sc. Lucija Bačić v.pred. A: Nataša Uzelac S: Nataša Uzelac	Sociology	ECTS:2.0		
P:mr.sc. Gorana Ćosić-Flajsig viši predavač A: Dejan Kovačević dipl.ing.građ. S: Dejan Kovačević dipl.ing.građ.	Environmental Protection	ECTS:2.0		
Undergraduate p	professional study in civil engineering	elective courses		
P:dr.sc. Ivana Špiranec prof. visoke škole A:dr.sc. Ivana Špiranec prof. visoke škole	English language l	ECTS:4.0		
P: Doc. dr. sc. Lidija Tepeš Golubić v. pred. A: Doc. dr. sc. Lidija Tepeš Golubić v. pred.	German Language I	ECTS:4.0		



Semester 4			
Undergraduate pr	ofessional study in civil engineering o	bligatory courses	
P:doc.dr.sc. Miroslav Šimun dipl.ing.građ. A: Sandra Mihalinac mag.ing.aedif. K: Sandra Mihalinac mag.ing.aedif. A:doc.dr.sc. Miroslav Šimun dipl.ing.građ. K:doc.dr.sc. Miroslav Šimun dipl.ing.građ.	Public Roads I	ECTS:5.0	
P:mr.sc. Željko Lebo v. pred. P:dr.sc. Sonja Zlatović , profesor visoke škole A: Ivana Pavlić K: Ivana Pavlić S: Ivana Pavlić	Geotechnical Engineering	ECTS:5.0	
P:v.predavač Boris Uremović dipl.ing.građ. P:mr.sc. Petar Adamović prof.v.škole A:v.predavač Boris Uremović dipl.ing.građ. A: Domagoj Šojat struč.spec.ing.aedif. A: Sanela Vojnović mag.ing.aedif	Construction Machinery	ECTS:4.0	
A: Natalija Špehar viši predavač	Kinesiology Education IV	ECTS:1.0	
P:dr.sc. Krunoslav Pavković dipl.ing.građ. P:prof.vis.šk. Boris Baljkas A:dr.sc. Krunoslav Pavković dipl.ing.građ. K:dr.sc. Krunoslav Pavković dipl.ing.građ. A: Šime Serdarević mag. ing. aedif. K: Šime Serdarević mag. ing. aedif.	Steel Structures	ECTS:5.0	
A: Domagoj Šojat struč.spec.ing.aedif. A: Zdravko Muratti A: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif A:v.predavač Boris Uremović dipl.ing.građ.	Field Practice	ECTS:2.0	
P:dr.sc. Mladen Petričec dipl.ing.građ. P:mr.sc. Gorana Ćosić-Flajsig viši predavač A: Dejan Kovačević dipl.ing.građ. A: Filip Kalinić mag. ing. aedif.	Introduction to Hydraulic Structures	ECTS:2.0	
Undergraduate p	professional study in civil engineering	elective courses	
P:mr.sc. Časlav Dunović , viši predavač A:mr.sc. Časlav Dunović , viši predavač S:mr.sc. Časlav Dunović , viši predavač S: Brigitta Cafuta	Market and Business Environment	ECTS:5.0	
Undergraduate professional study in civil engineering elective courses			
P:dr.sc. Mladen Petričec dipl.ing.građ. P: Ivana Bartolić , pred. A: Ivana Bartolić , pred. K: Ivana Bartolić , pred. S: Ivana Bartolić , pred. A: Filip Kalinić mag. ing. aedif. K: Filip Kalinić mag. ing. aedif. S: Filip Kalinić mag. ing. aedif.	Hydrology and Hydraulics	ECTS:5.0	
Undergraduate p	professional study in civil engineering	elective courses	
P:dr.sc. Mladen Petričec dipl.ing.građ. P: Ivana Bartolić , pred. A: Ivana Bartolić , pred. K: Ivana Bartolić , pred.	Hydrology and Hydraulics	ECTS:5.0	

S: Ivana Bartolić , pred. A: Filip Kalinić mag. ing. aedif. K: Filip Kalinić mag. ing. aedif. S: Filip Kalinić mag. ing. aedif.		
Undergraduate p	professional study in civil engineering	elective courses
P:dr.sc. Igor Gukov , dipl.ing.građ. A:dr.sc. Igor Gukov , dipl.ing.građ. L:dr.sc. Igor Gukov , dipl.ing.građ. A: Ivan Volarić struč.spec.ing.aedif. L: Ivan Volarić struč.spec.ing.aedif.	Concrete Structures II	ECTS:5.0
Undergraduate p	professional study in civil engineering	elective courses
P:dr.sc. Ivana Špiranec prof. visoke škole A:dr.sc. Ivana Špiranec prof. visoke škole	English Language II	ECTS:2.0
P: Doc. dr. sc. Lidija Tepeš Golubić v. pred. A: Doc. dr. sc. Lidija Tepeš Golubić v. pred.	German Language II	ECTS:2.0



Semester 5			
Building Construction obligatory courses			
P:dr.sc. Dražen Arbutina dipl.ing.arh. P: Ivan Cetinić dipl.ing.str. P: Tihomir Rengel A: Ivan Cetinić dipl.ing.str. A: Tihomir Rengel	Building Installations I	ECTS:4.0	
P:mr.sc. Jure Galić predavač P:dr.sc. Krunoslav Pavković dipl.ing.građ. A:dr.sc. Krunoslav Pavković dipl.ing.građ. A: Šime Serdarević mag. ing. aedif.	Prefabricated Structures	ECTS:5.0	
P:v.predavač Boris Uremović dipl.ing.građ. P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif	Construction Management I	ECTS:5.0	
P:mr.sc. Ante Goran Bajić viši predavač	Introduction to Railways	ECTS:2.0	
P:v.predavač Boris Uremović dipl.ing.građ. A:prof.dr.sc. Vjeran Mlinarić dipl.ing.građ K:prof.dr.sc. Vjeran Mlinarić dipl.ing.građ A:v.predavač Boris Uremović dipl.ing.građ. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif	Construction Technology	ECTS:5.0	
P: Sanja Lađarević dipl.ing.arh. P:dr.sc. Dražen Arbutina dipl.ing.arh. A: Goran Babić K: Goran Babić	Finishing Works	ECTS:5.0	
P: Iva Ževrnja predavač P: Jagoda Bodić dipl.ing.arh. A: Jagoda Bodić dipl.ing.arh. K: Jagoda Bodić dipl.ing.arh. A: Iva Ževrnja predavač K: Iva Ževrnja predavač	Building Engineering I	ECTS:4.0	
Civil Engineering (Water and traffic infrastructure) obligatory courses			
P:doc.dr.sc. Miroslav Simun dipl.ing.građ. A: Sandra Mihalinac mag.ing.aedif. K: Sandra Mihalinac mag.ing.aedif. A:doc.dr.sc. Miroslav Šimun dipl.ing.građ. K:doc.dr.sc. Miroslav Šimun dipl.ing.građ.	Pudiic Roads II	EC15:5.0	
P:mr.sc. Gorana Ćosić-Flajsig viši predavač P: Stjepan Kordek dipl.ing.građ. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ.	Water Supply and Sewerage I	ECTS:4.0	
P:v.predavač Boris Uremović dipl.ing.građ.	Construction Management I	ECTS:5.0	

P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif		
P:mr.sc. Ante Goran Bajić viši predavač	Introduction to Railways	ECTS:2.0
P:dr.sc. Mladen Petričec dipl.ing.građ. P: Ivana Bartolić , pred. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. A: Filip Kalinić mag. ing. aedif. K: Filip Kalinić mag. ing. aedif.	Regulation and Amelioration Drainage	ECTS:5.0
P:v.predavač Boris Uremović dipl.ing.građ. A:prof.dr.sc. Vjeran Mlinarić dipl.ing.građ K:prof.dr.sc. Vjeran Mlinarić dipl.ing.građ A:v.predavač Boris Uremović dipl.ing.građ. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif	Construction Technology	ECTS:5.0
P:dr.sc. Mladen Petričec dipl.ing.građ. P: Ivana Bartolić , pred. A: Željko Pavlin dipl.ing.građ. A: Berislav Rupčić K: Berislav Rupčić	Hydraulic Structures	ECTS:4.0
Manage	ement in Civil Engineering obligatory of	courses
P:mr.sc. Lucija Bačić v.pred. A:mr.sc. Lucija Bačić v.pred. S:mr.sc. Lucija Bačić v.pred. A: Nataša Uzelac S: Nataša Uzelac	Methodology and Management in Civil Engineering	ECTS:2.0
P:v.predavač Boris Uremović dipl.ing.građ. P:mr.sc. Petar Adamović prof.v.škole A:v.predavač Boris Uremović dipl.ing.građ. K:v.predavač Boris Uremović dipl.ing.građ. A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif.	Organization of Construction Site	ECTS:6.0
P:v.predavač Boris Uremović dipl.ing.građ. P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif	Construction Management I	ECTS:5.0

P:mr.sc. Ante Goran Bajić viši predavač	Introduction to Railways	ECTS:2.0
P:mr. Alenka Poljičak dipl.oec., viši predavač A:mr. Alenka Poljičak dipl.oec., viši predavač K:mr. Alenka Poljičak dipl.oec., viši predavač	Conduct of Company Business Operations	ECTS:5.0
P:mr.sc. Petar Adamović prof.v.škole P:v.predavač Boris Uremović dipl.ing.građ. A:mr.sc. Petar Adamović prof.v.škole S:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. S: Domagoj Šojat struč.spec.ing.aedif.	Project Management and Legislation	ECTS:5.0
P:v.predavač Boris Uremović dipl.ing.građ. A:prof.dr.sc. Vjeran Mlinarić dipl.ing.građ K:prof.dr.sc. Vjeran Mlinarić dipl.ing.građ A:v.predavač Boris Uremović dipl.ing.građ. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif	Construction Technology	ECTS:5.0
Civil and	Environmental Engineering obligator	y courses
P:mr.sc. Gorana Ćosić-Flajsig viši predavač P: Tomislav Domanovac A: Tomislav Domanovac S: Tomislav Domanovac P:mr.sc. Gorana Ćosić-Flajsig viši predavač P:dr.sc. Ivan Vučković dipl.ing.biologije L:dr.sc. Ivan Vučković dipl.ing.biologije	Waste Management Water Quality	ECTS:4.0 ECTS:4.0
P:mr.sc. Gorana Ćosić-Flajsig viši predavač P:dr.sc. Mladen Petričec dipl.ing.građ. A:dr.sc. Mladen Petričec dipl.ing.građ. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ.	Water Use	ECTS:5.0
P:v.predavač Boris Uremović dipl.ing.građ. P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif	Construction Management I	ECTS:5.0
P:mr.sc. Ante Goran Bajić viši predavač	Introduction to Railways	ECTS:2.0
P:v.predavač Boris Uremović dipl.ing.građ. A:prof.dr.sc. Vjeran Mlinarić dipl.ing.građ K:prof.dr.sc. Vjeran Mlinarić dipl.ing.građ	Construction Technology	ECTS:5.0

A:v.predavač Boris Uremović dipl.ing.građ. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif		
P:mr.sc. Gorana Ćosić-Flajsig viši predavač A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. L: Dejan Kovačević dipl.ing.građ. S: Dejan Kovačević dipl.ing.građ. A: Marin Ganjto	Water protection	ECTS:5.0



Semester 6		
В	uilding Construction obligatory course	25
P:dr.sc. Dražen Arbutina dipl.ing.arh. P: Ivan Cetinić dipl.ing.str. P: Tihomir Rengel A: Tihomir Rengel K: Tihomir Rengel	Building Installations II	ECTS:4.0
P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif	Construction Management II	ECTS:5.0
Pidrisci Dražen Arbutina diplingiam.	Engineering	ECTS:2.0
P:dr.sc. Drazen Arbutina dipi.ing.arn.	Introduction to Physical Planning	ECTS:2.0
P: Iva Zevrnja predavač P: Jagoda Bodić dipl.ing.arh. A: Jagoda Bodić dipl.ing.arh. K: Jagoda Bodić dipl.ing.arh. A:dr.sc. Dražen Arbutina dipl.ing.arh. K:dr.sc. Dražen Arbutina dipl.ing.arh. A: Iva Ževrnja predavač K: Iva Ževrnja predavač	Building Engineering II	ECTS:5.0
	Building Construction elective courses	5
P: Jagoda Bodić dipl.ing.arh.	Final Thesis with Field Practice	ECTS:12.0
Civil Engineerin	g (Water and traffic infrastructure) ob	ligatory courses
P:mr.sc. Gorana Ćosić-Flajsig viši predavač A:mr.sc. Gorana Ćosić-Flajsig viši predavač A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. A: Marin Ganjto	Water Supply and Sewerage II	ECTS:5.0
P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif	Construction Management II	ECTS:5.0
P:dr.sc. Dražen Arbutina dipl.ing.arh.	Introduction to Physical Planning	ECTS:2.0
P:mr.sc. Ante Goran Bajić viši predavač A:mr.sc. Ante Goran Bajić viši predavač K:mr.sc. Ante Goran Bajić viši predavač	Railways	ECTS:6.0
Civil Engineering (Water and traffic infrastructure) elective courses		
P: Jagoda Bodić dipl.ing.arh.	Final Thesis with Field Practice	ECTS:12.0

Manag	ement in Civil Engineering obligatory	courses
P:mr.sc. Časlav Dunović , viši predavač	Planning Methods	ECTS:6.0
A:v.predavač Boris Uremović		
A: Domagoi Šojat struč.spec.ing.aedif.		
K: Domagoj Šojat struč.spec.ing.aedif.		
A: Nina Šantek struč.spec.ing.aedif.,		
predavac K· Nina Šantek struč spec ing aedif		
predavač		
K: Sanela Vojnović mag.ing.aedif		
P: Nina Šantek struč.spec.ing.aedif.,	Construction Management II	ECTS:5.0
P:mr.sc. Petar Adamović prof.v.škole		
A: Domagoj Šojat struč.spec.ing.aedif.		
K: Domagoj Šojat struč.spec.ing.aedif.		
A: Nina Santek struc.spec.ing.aedif.,		
K: Nina Šantek struč.spec.ing.aedif.,		
predavač		
A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif		
P:dr.sc. Dražen Arbutina dipl.ing.arh.	Introduction to Physical Planning	ECTS:2.0
P:dr.sc. Dražen Arbutina dipl.ing.arh.	Safety at Work	ECTS:5.0
P: Zdravko Muratti		
A:v.predavač Boris Uremović		
dipi.ing.grad. K:v.predavač Boris Uremović		
dipl.ing.građ.		
A: Zdravko Muratti		
K: Zdravko Muratti		
Manag	gement in Civil Engineering elective c	ourses
Nositelj predmeta nije poznat Final Thesis with Field Practice ECTS:12.0		
Nositelj predmeta nije poznat	Final Thesis with Field Practice	ECTS:12.0
Civil and	Final Thesis with Field Practice Environmental Engineering obligator	ECIS:12.0 y courses
Civil and P: Nina Šantek struč.spec.ing.aedif.,	Final Thesis with Field Practice Environmental Engineering obligator Construction Management II	ECTS:12.0 y courses ECTS:5.0
P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole	Final Thesis with Field Practice Environmental Engineering obligator Construction Management II	ECTS:12.0 y courses ECTS:5.0
P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif.	Final Thesis with Field Practice Environmental Engineering obligator Construction Management II	ECTS:12.0 y courses ECTS:5.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif.	Final Thesis with Field Practice Environmental Engineering obligator Construction Management II	ECTS:12.0 y courses ECTS:5.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif. A: Nina Šantek struč.spec.ing.aedif., predavač	Final Thesis with Field Practice Environmental Engineering obligator Construction Management II	ECTS:12.0 y courses ECTS:5.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif.,	Final Thesis with Field Practice Environmental Engineering obligator Construction Management II	ECTS:12.0 y courses ECTS:5.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač	Environmental Engineering obligator Construction Management II	ECTS:12.0 y courses ECTS:5.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif	Final Thesis with Field Practice Environmental Engineering obligator Construction Management II	ECTS:12.0 y courses ECTS:5.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif	Environmental Engineering obligator Construction Management II	ECTS:12.0 y courses ECTS:5.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif P: Ivana Bartolić , pred.	Final Thesis with Field Practice Environmental Engineering obligator Construction Management II Transport and Environment	ECTS:12.0 y courses ECTS:5.0 ECTS:5.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ.	Final Thesis with Field Practice Environmental Engineering obligator Construction Management II Transport and Environment	ECTS:12.0 y courses ECTS:5.0 ECTS:5.0
Civil and Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ.	Environmental Engineering obligator Construction Management II	ECTS:12.0 y courses ECTS:5.0 ECTS:5.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif. A: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif F: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ.	Environmental Engineering obligator Construction Management II Transport and Environment	ECTS:5.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ.	Environmental Engineering obligator Construction Management II Transport and Environment River Engineering	ECTS:5.0 ECTS:5.0 ECTS:5.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif K: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. M: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ.	Environmental Engineering obligator Construction Management II Transport and Environment River Engineering	ECTS:5.0 ECTS:5.0 ECTS:5.0
Civil and Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif K: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif F: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. A: Jojan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. A: Ivana Bartolić , pred.	Environmental Engineering obligator Construction Management II Transport and Environment River Engineering	ECTS:5.0 ECTS:5.0 ECTS:5.0
Civil and Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif K: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. A: Jorana Bartolić , pred. P: Ivana Bartolić , pred. P: Ivana Bartolić , pred. K: Ivana Bartolić , pred. K: Ivana Bartolić , pred. K: Ivana Bartolić , pred.	Environmental Engineering obligator Construction Management II Transport and Environment River Engineering	ECTS:5.0 ECTS:5.0 ECTS:5.0 ECTS:5.0
Civil and Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif K: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. K: Joana Bartolić , pred. P: Ivana Bartolić , pred. K:dr.sc. Darko Barbalić dipl.ing.građ. K: Ivana Bartolić , pred. S: Ivana Bartolić , pred.	Environmental Engineering obligator Construction Management II Transport and Environment River Engineering	ECTS:5.0 ECTS:5.0 ECTS:5.0
Civil and Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač A: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. K: dr.sc. Darko Barbalić dipl.ing.građ. A: Ivana Bartolić , pred. S: Ivana Bartolić , pred. P:dr.sc. Dražen Arbutina dipl.ing.arh.	Environmental Engineering obligator Construction Management II Transport and Environment River Engineering Introduction to Physical Planning	ECTS:5.0 ECTS:5.0 ECTS:5.0 ECTS:5.0 ECTS:6.0
Civil and Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. P: Ivana Bartolić , pred. P:dr.sc. Darko Barbalić dipl.ing.građ. A: Ivana Bartolić , pred. S: Ivana Bartolić , pred. P:dr.sc. Dražen Arbutina dipl.ing.arh.	Final Thesis with Field Practice Environmental Engineering obligator Construction Management II Transport and Environment River Engineering Introduction to Physical Planning d Environmental Engineering elective	ECTS:5.0 ECTS:5.0 ECTS:5.0 ECTS:5.0 ECTS:6.0 ECTS:2.0
Civil and P: Nina Šantek struč.spec.ing.aedif., predavač P:mr.sc. Petar Adamović prof.v.škole A: Domagoj Šojat struč.spec.ing.aedif. K: Domagoj Šojat struč.spec.ing.aedif., predavač K: Nina Šantek struč.spec.ing.aedif., predavač A: Sanela Vojnović mag.ing.aedif K: Sanela Vojnović mag.ing.aedif P: Ivana Bartolić , pred. P:dr.sc. Mladen Petričec dipl.ing.građ. A: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. K: Dejan Kovačević dipl.ing.građ. K: Juana Bartolić , pred. P: Ivana Bartolić , pred. P: Ivana Bartolić , pred. P: Ivana Bartolić , pred. P: Ivana Bartolić , pred. K: Ivana Bartolić , pred. S: Ivana Bartolić , pred. S: Ivana Bartolić , pred. P: dr.sc. Dražen Arbutina dipl.ing.arh. Civil an P: Jagoda Bodić dipl.ing.arh.	Final Thesis with Field Practice Environmental Engineering obligator Construction Management II Transport and Environment River Engineering Introduction to Physical Planning d Environmental Engineering elective Final Thesis with Field Practice	ECTS:5.0 ECTS:5.0 ECTS:5.0 ECTS:5.0 ECTS:6.0 ECTS:2.0 Courses ECTS:12.0

Study programme	for academic	year 2018/2019
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Code WEB/ISVU	23434/155931	ECTS	7.0	Academic year	2018/2019
Name	Building elements I				
Status	1st semester - Undergr	aduate professional stud	y in civil engineering (R	edovni graditeljstvo) - ob	ligatory course
Teaching mode	Lectures + exercises (a	auditory + laboratory + s	eminar + metodology +	- construction)	45+45 (9+0+0+36)
T I	work at home				120
leachers	Lectures: 1. Sanja Ladai	revic dipl.ing.arh.			
	Lectures: Zoran Veršić	preuavac			
	Auditory exercises: Gor	ran Babić			
	Auditory exercises: Ber	marda Cesar			
	Auditory exercises: Iva	Ževrnja predavač			
	Construction exercises	: Goran Babić			
	Construction exercises	: Demarua Cesar : Iva Ževrnia predavač			
Course objectives	Acquirement of basic k	nowledge on various bui	dina elements including	materials structures a	nd construction
course objectives	methods. Building phys	sics.	ang clements including	, materials, structures, a	
Learning outcomes:	1.differentiate between	foundation types and in	sulation methods for pro	otection against ground	water and moisture.
	Level:6				
	2.make sketch drawing	s of load bearing, partiti	on, and multilayer walls	made of various materia	lls. Level:6
	3.draw brick joints: and	gle joint, butt joint, and w	all intersection joint. Le	vel:6	
	5 connect wall opening	s and their realization in	different wall types I ev		
	6.differentiate betweer	chimney and ventilation	opening types, accordi	ng to material, shape, w	av of construction. and
	evacuation of combust	ion products. Level:6			-,
	7.draw layout plan and	conceptual drawing. Lev	vel:6		
	8.analyze external and	internal actions on build	ing from the standpoint	of energy savings, thern	nal protection, and noise
	protection. Level:6	ooring structures from t	he standpoint of anoray	covings thermal protect	tion and noise
	protection Level 6 7	leening structures from t	he standpoint of energy	savings, thermal protect	lon, and noise
	10.calculate numerical	values of engineering-pl	nysical properties of an e	external multilaver wall.	Level:6
		5 51			
Methods of carrying	Building elements, mat	erials, structures and co	nstruction methods are	explained through the dr	awing process and by
out lectures	using finished drawings	s of individual elements a	and details. To facilitate	comprehensions of cours	se material and enhance
	a sense of graphical ex	pression, students are re	equired to produce draw	ings relating to lectures.	Building physics:
	Specialized professiona	als will give lectures (15+	15) at the end of the fir	st semester.	
Methods of carrying	Group problem solving	ina			
exercises		ing			
How construction	Other				
exercises are held	Elaboration of graphica	l (numerical) assignmen	ts with the assistance of	lecturer when needed.	
Course content	1.Introduction, notion c	of a building, structural e	ements of buildings , 3h	n, Learning outcomes:6	
lectures	2.Foundations, 3h, Lea	rning outcomes:6			
	3.Waterproofing as pro	tection against ground w	ater and moisture, 3h, I	_earning outcomes:6	
	4. Vertical structural ele	ements presented by mai	cerials , 3n, Learning out	comes:6	
	Walls made of stone, 1	h. Learning outcomes:7			
	6.Walls made of wood,	, 1h, Learning outcomes:	7		
	Walls made of concrete	e blocks, lightweight cond	crete, 2h, Learning outco	omes:7	
	7.Traditional and mode	rn types of formwork , 1	h, Learning outcomes:7		
	Walls made of monolith	hic concrete, 1h, Learning	g outcomes:7		
	Multilayered walls, In, 8 Partitions walls, 1b, 1	Learning outcomes:7			
	Openings in walls, 2h, I	Learning outcomes:7			
	9.Ventilation ducts , 1h	, Learning outcomes:7			
	Chimneys, 2h, Learning	g outcomes:7			
	10.Chimneys, 3h, Learr	ning outcomes:7			
	Thermal conductivity 1	earning outcomes: 7			
	Values of heat transfer	coefficients . 1h. Learnir	ia outcomes:7		
	12.Water vapour conde	ensation. , 1h, Learning o	utcomes:7		
	Thermal bridges, 1h, Le	earning outcomes:7			
	Water vapour diffusion	., 1h, Learning outcomes	:7	-	
	13. Temperature Variati	lons and temperature str	esses , In, Learning out	comes: /	
	14.Noise, 1h. Learning	outcomes:7			
	Sound waves, 1h, Learn	ning outcomes:7			
	Sound absorption, 1h, I	Learning outcomes:7			
	15.Transfer of airborne	sound and impact sound	d., 2h, Learning outcom	es:7	
	Insulation, 1h, Learning	g outcomes: /			
Course content	1 Design report proper	ation phases: content on	d presentation of each r	hace 3h Learning outer	omes:7
auditorv	2.Instructions for prepar	aration of drawings. 1h 1	earning outcomes:7	mase, on, Learning outco	20065.7
	3		succines./		
	4.Instructions for prepa	aration of drawings, 1h, L	earning outcomes:7		
	5	and the second			
	b.Instructions for prepa	aration of drawings, 1h, L	earning outcomes:7		
	/				

	8 9 10
	11.Guidelines for solving numerical problems, 1h, Learning outcomes:7
	13.Guidelines for solving numerical problems , 1h, Learning outcomes:7
	14
	15
Course content	1
constructures	2.Individual elaboration of all design phases for a residential building, 2h, Learning outcomes:7
	3.Preliminary design, detailed design, 3h, Learning outcomes:7
	4. Preiminary design, detailed design, 2.1, Learning outcomes:7
	6.Preliminary design, detailed design , 2h, Learning outcomes:7
	7.Working design (plan) of the ground floor , 3h, Learning outcomes:7
	8.Working design (plan) of the ground floor, 3h, Learning outcomes:7
	9. Working design (plan) of the ground floor , 3n, Learning outcomes: 7
	11.Each student is to prepare a numerical example for calculation of building physics properties of a multilayered
	external wall , 2h, Learning outcomes:7
	12.Each student is to prepare a numerical example for calculation of building physics properties of a multilayered
	13.Each student is to prepare a numerical example for calculation of building physics properties of a multilavered
	external wall , 2h, Learning outcomes:7
	14.Each student is to prepare a numerical example for calculation of building physics properties of a multilayered
	external wall , 3h, Learning outcomes:7 15 Each student is to property a numerical example for calculation of huilding physics properties of a multilayered
	external wall . 3h. Learning outcomes:7
Required materials	Basic: classroom, blackboard, chalk
	Whiteboard with markers
	Overnead projector Video equipment
	Elaboration of graphical (numerical) assignments with the assistance of lecturer when needed.
Exam literature	Basic literature:
	1.Sanja Lađarević: Elementi zgrada l
	2. Peulic: Konstruktivni elementi zgrada I.i II, Tehnicka knjiga, Zagreb, 1980. 2. z. Vichian I. Kordiži, Oramo građavinskih naota. Eskultat građavinskih znanosti Zagreb, 1982.
	4.V. Šimetin: Građevinska fizika, skripta, Građevinski institut, Zagreb, 1983.
	Additional literature:
	1. Heinrich Schmitt: Hochbaukonstruktion
Chudanta aklinationa	2. Martin Mittag: Gradevinske konstrukcije
Students obligations	Redevitest poloo
evaluation during	Kolokvii: teoriiska pitania, grafi zadaci, raski zadaci
semester	Programski zadatak
Knowledge	Assignments (5 drawings + solution to a building physics numerical problem) - requirements for lecturer's signature
semester	Preliminary examinations: 1) bolicing Physics (obligatory); $2 + 1$ in the first semiester + 2 in the second semester (not obligatory); however those who hass them are not required to take the written northon of the final examination)
	Final examination - written and oral (to be taken at the end of the academic year). Written part of the examination:
	presentation of knowledge through drawing; oral part of the examination: verifying comprehension of the subject-
	matter taught during the course.
Student activities:	AKTIVNOST ECIS
	(Project) 2
	(Written exam) 2
	(Constantly tested knowledge) 2
Remark	This course can be used for final thesis theme
Prerequisites:	No prerequisites.
15VU equivalents:	22340;

Code WEB/ISVU	23435/155932	ECTS	5.0	Academic year	2018/2019
Name	Building elements II	•	•	•	-
Status	2nd semester - Underg	raduate professional	study in civil engir	neering (Redovni graditeljstvo) -	obligatory course
Teaching mode	Lectures + exercises (work at home	auditory + laboratory	+ seminar + meto	odology + construction)	30+30 (6+0+0+24) 90
Teachers	Lectures:1. Sanja Lađa	rević dipl.ing.arh.			
	Lectures:2. Iva Ževrnja	predavač			
	Auditory exercises: Go	ran Babić			
	Auditory exercises: Be	Ževrnia predavač			
	Construction exercises	: Goran Babić			
	Construction exercises	: Bernarda Cesar			
	Construction exercises	: Iva Ževrnja predava	ıč		
Course objectives	Acquirement of basic k methods.	nowledge on various	building elements	including materials, structures,	and construction
Learning outcomes:	1.differentiate betwee	n lightweight and ma	ssive horizontal str	uctural elements. Level:6	
	2.make a sketch drawi	ng of different types	of floor structures	depending on the type of mater	ial and construction
	technology. Level:6				
	3.differentiate and pre	sent graphically pitch	ied roofings from t	he aspect of construction metho	d, materials and roof
	4 correlate specific fea	tures of flat roofs fro	m the standpoint o	f their engineering-physical pro	perties and typical details
	and present them grap	phically. Level:6,7		r their engineering physical pro	services and cypical actains,
	5.calculate dimensions	of stair elements co	nsidering the speci	fied height and plan view of the	zone, and present them
	graphically, both in pla	in and cross-section,	taking into accoun	t different construction methods	and structural systems.
	Level:0 6 make working drawii	na of a building. Leve	1.6		
	0.make working drawn	ig of a building. Leve	1.0		
Methods of carrying	Ex cathedra teaching				
out lectures	Case studies				
	Discussion				
	Questions and answers	5			
	other				
Methods of carrying	Group problem solving				
out auditory					
exercises					
How construction	Group problem solving	ing			
exercises are field		ing			
Course content	1.Horizontal structural	elements , 2h, Learn	ing outcomes:6		
lectures	2.Lightweight and mas	sive structures, const	truction technology	, 2h, Learning outcomes:6	
	3.Monolithic floors , 2h	, Learning outcomes:	6		
	5 Prefabricated floors	2h Learning outcom	utcomes:o		
	6. Roofs, 2h, Learning	outcomes:6			
	7.Sloped roofs , 2h, Le	arning outcomes:6			
	8.Sloped roofs , 2h, Le	arning outcomes:6			
	10 Flat roofs 2h Lear	ning outcomes:6			
	11.Flat roofs , 2h, Lear	ning outcomes:6			
	12. Stairs, 2h, Learning	g outcomes:6			
	13.Stairs made of mon	olithic reinforced-con	crete , 2h, Learnin	g outcomes:6	
	14.Stairs made of pref	abricated reinforced-	concrete , 2h, Lear ning outcomes:6	ning outcomes:6	
			ing outcomes.o		
Course content	1.Design report prepar	ation phases; conten	t and presentation	of each phase., 1h, Learning ou	itcomes:6
auditory	2.nstructions for prepa	ration of drawings , 1	h, Learning outcor	nes:6	
	3, 2n 4				
	5.Instructions for prepa	aration of drawings . :	lh		
	6	5-,			
	7.nstructions for prepa	ration of drawings , 1	h, Learning outcor	nes:6	
	8.nstructions for prepa	ration of drawings , 1	h, Learning outcor	nes:6	
	10	itation of drawings , 1	III, Learning Outcor	nes.o	
	11				
	12				
	13				
	14 15				
Course content	1.Individual elaboratio	n of all design phases	for a residential b	uilding, 1h, Learning outcomes:	6
constructures	2.Working design (bas	ement) , 1h, Learning	outcomes:6	-	
	3.Working design (bas	ement), 2h, Learning	outcomes:6		
	5.Working design (bas	ement) , 211, Learning ement) , 2h. Learning	outcomes:6		
	6.Working design (root	plan and roof cross-s	section), 1h, Learni	ng outcomes:6	

	 7.Working design (roof plan and roof cross-section), 1h, Learning outcomes:6 8.Working design (roof plan and roof cross-section), 2h, Learning outcomes:6 9.Working design (roof plan and roof cross-section), 2h, Learning outcomes:6 10.Working design (cross section), 1h, Learning outcomes:6 12.Working design (cross section), 1h, Learning outcomes:6 13.Working design (cross section), 2h, Learning outcomes:6 14.Working design (cross section), 2h, Learning outcomes:6 15.Working design (cross section), 2h, Learning outcomes:6
Required materials	Basic: classroom, blackboard, chalk Special purpose computer laboratory Whiteboard with markers Portable overhead projector
Exam literature	Basic literature: 1. M.Smoljanović: Separati predavanja 2. ?. Peulić: Konstruktivni elementi zgrada I i II, Tehnička knjiga, Zagreb, 1980. 3. Z. Vrkljan, I. Kordiš: Opreme građevinskih nacrta, Fakultet građevinskih znanosti Zagreb, 1982. Additional literature: 1. Heinrich Schmitt: Hochbaukonstruktion 2. Martin Mittag: Građevinske konstrukcije
Students obligations	maximum of 3 absences from exercises
Knowledge evaluation during semester	Redovitost pohaa#20#0#60\$Kolokvij, teorijska pitanja#2#80#55\$Programski zadatak#3#20#100\$
Knowledge evaluation after semester	Final examination - written and oral (to be taken at the end of the academic year). Written part of the examination: presentation of knowledge through drawing; oral part of the examination: verifying comprehension of the subject- matter taught during the course.
Student activities:	Aktivnost ECTS (Classes attendance) 1 (Constantly tested knowledge) 2 (Written exam) 1 (Project) 1
Remark	This course can be used for final thesis theme
Prerequisites:	No prerequisites.
ISVU equivalents:	22341;

Study programme	for academic year	2018/2019
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Code WEB/ISVU	23944/184757	ECTS	4.0	Academic year	2018/2019
Name	Building Engineering I	•	I		•
Status	5th semester - Building	Construction (Redovni graditeljstvo) - o	bligatory course	
Teaching mode	Lectures + exercises (a	auditory + labor	ratory + seminar + meto	dology + construction)	30+30 (2+0+0+28)
	work at home				60
Teachers	Lectures:1. Jagoda Bod	lić dipl.ing.arh.			
	Lectures: Iva Zevrnja p	redavač odo Rodić dipli	ng arb		
	Auditory exercises: Jag	Ževrnia predav	ng.am. /ač		
	Construction exercises	: Jagoda Bodić d	dipl.ing.arh.		
	Construction exercises	: Iva Ževrnja pr	edavač		
Course objectives	Students will acquire p	ractical knowled	dge for competent work i	n design offices and constructi	on companies.
Learning outcomes:	1.analyze functions of a	an apartment. I	_evel:6		
	2.draw a detached fam	illy house at the with regard to	e detailed design and wor	King design levels. Level:6	irements Level:67
	4.make drawing to con	nect functional	groups in housing space.	. Level:6.7	Terrents. Level.0,7
	5.propose structural sy	stem taking int	o account the size of the	building, economic considerat	ons, and materials.
	Level:6,7				
	6.integrate knowledge	gained on build	ling elements, building pl	nysics, finishing works, installa	tions and structural
	systems during prepara		alleu uesiyli allu workiliy	design. Level.0,7	
Methods of carrying	Ex cathedra teaching				
out lectures	Guest lecturer				
	Case studies				
	Discussion				
	Homework presentation	'n			
	Other				
	During presentation of	theoretical lect	ures appropriate teaching	g aids (projectors) are used in	combination with drawings
	on the blackboard. Stud	dents are requi	red to make their own dra	awings so as to develop the se	nse of graphical
Methods of carrying	Group problem solving				
out auditory	Discussion, brainstorm	ing			
exercises	Other	5			
	Instructions for the pre	paration of the	assignment and seminar	paper. Analysis of exemplary	student work prepared in
	previous years.				
How construction	Uther Independent preparati	ion of the assig	oment with corrections a		
Course content	1.Introduction. problem	ns and significat	nce of the design of resid	ential buildings, 2h. Learning o	outcomes:3
lectures	2. Architectural barrier	s. Technical doo	cumentation and the build	ding law, 2h, Learning outcome	es:3
	3.Design elements: ma	in as a measure	e of all things, 2h, Learnin	ig outcomes:1,3	
	4.Positioning building ii	n the plot with i	regard to the sides of the	world and according to constr	uction requirements, 2h,
	5.Positioning building in	n the plot with r	regard to the sides of the	world and according to constr	uction requirements. 2h.
	Learning outcomes:1,3	·	5	5	
	6.Apartment and its fur	nctions, 2h, Lea	rning outcomes:1,3,4	1 7 4	
	8 Solution to functional	cases, corridors Larouns in an a	, 2h, Learning outcomes: partment: living quarters	1,3,4 2h Learning outcomes:134	
	9.Solution to functional	l groups in an a	partment: sleeping guart	ers, sanitary rooms , 2h, Learn	ing outcomes:1,3,4
	10.Solution to function	al groups in an	apartment: utility area, 2	h, Learning outcomes:1,3,4	
	11.Solution to function	al groups in an	apartment: utility area, 2	h, Learning outcomes:1,3,4	
	12.Cross section, facad	ies - examples a ached houses - e	and analyses , 2n, Learni examples and analyses	ng outcomes:1,2,5,6 2h Learning outcomes:1.3	
	14.Family houses: deta	iched houses - e	examples and analyses ,	2h, Learning outcomes:1,3	
	15.Family houses: deta	ched houses - e	examples and analyses ,	2h, Learning outcomes:1,3	
	1 December 1 - Consul		dende freshrushiene fresh		2h. L
Course content	1.Presentation of regul	ations and stan	dards, instructions for the	e preparation of assignments, .	2n, Learning outcomes:1,3
	3				
	4				
	5				
	0 7				
	8				
	9				
	10				
	11 12				
	13				
	14				
	15				
Course content	1				
constructures	2.Independent elaborat	tion of the first	assignment : family hous	e detailed design and working	design details, 2h
	Learning outcomes:2,3	,4,5,6	gimene i ranniy nous	acoign and working	
	3.Independent elaborat	tion of the first	assignment : family hous	e detailed design and working	design details, 2h,
I	Learning outcomes:2,3	,4,5,6			

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	 4.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 5.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 6.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 7.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 8.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 8.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 9.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 10.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 10.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 12.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 12.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 13.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 13.Independent elaboration of the first assignment : family house detailed design and working design details, 2h, Learning outcomes:2,3,4,5,6 14.Independent elaboration of the first assignment : family house detailed design
	Learning outcomes:2,5,4,5,6
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Overhead projector Video equipment Independent preparation of the assignment, with corrections as necessary.
Exam literature	 J. Bodić : Separati predavanja J. Bodić : LŽevrnja: Zgradarstvo I priručnik za izvođenje konstrukcijskih vježbi; izbor studentskih radova iz programa samostojećih obiteljskih zgrada Lj. Biondić: Uvod u projektiranje stambenih zgrada, Golden marketing - Tehnička knjiga, Zagreb, 2011 G. Knežević, I. Kordiš: Stambene i javne zgrade (V izdanje), Tehnička knjiga , Zagreb 1981 G. Knežević: Višestambene zgrade, Tehnička knjiga, Zagreb 1986 E.Neufert: Elementi arhitektonskog projektiranja, Golden marketing, Zagreb 2002 A.Štulhofer, Z.Veršić: Crtanje arhitektonskih nacrta, Pribor i osnove, UPI-2m,Zagreb1998 Zakon o prostornom uređenju i gradnji 153/13 P.Pravilnik o pristupačnosti građevine osobama s invaliditetom i smanjene pokretljivosti,NN 78/2013 Oris, časopis za arhitekturu i kulturu
Students obligations	
Knowledge evaluation during semester	
Knowledge evaluation after semester	
Student activities:	Aktivnost ECTS (Project) 3 (Written exam) 1
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have passed Građevinski materijali Students cannot enroll in this course unless they have passed Betonske konstrukcije II
ISVU equivalents:	22383;155984;

Code WEB/ISVU	23948/184761	ECTS	5.0	Academic year	2018/2019
Name	Building Engineering I	1			
Status	6th semester - Buildin	g Construction (Redovr	ni graditeljstvo) - obligato	ry course	
Teaching mode	Lectures + exercises ((auditory + laboratory -	+ seminar + metodology	+ construction)	30+30 (2+0+0+28)
	work at home				90
Teachers	Lectures:1. Jagoda Bo	dić dipl.ing.arh.			
	Lectures: Iva Zevrnja Auditory exercises:dr	predavac sc. Dražen Arbutina din	l ing arh		
	Auditory exercises: la	goda Bodić dipl.ing.arh.	i.ing.am.		
	Auditory exercises: Iva	a Ževrnja predavač			
	Construction exercises	s:dr.sc. Dražen Arbutina	a dipl.ing.arh.		
	Construction exercises	s: Jagoda Bodić dipl.ing	.arh.		
Course objectives	Construction exercises	s: Iva Zevrnja predavač	compotent work in desig	n offices and constructio	
Course objectives	Students will acquire i	practical knowledge for	competent work in desig	n onices and constructio	n companies.
Learning outcomes:	2 classify apartments	according to the distrib	ution of basic babitation	units Level:67	
	3.draw the structure of	of apartments (plan view	vs) in a multi-family build	ing at the preliminary de	sign level, based on the
	selection of communio	cations (means of acces	ss). Level:6	5 , , ,	5
	4.planirati položaj zgra	ade obzirom uvjete gra	đenja . Level:6,7		
	5.draw functional living groups in multi-family buildings. Level:6,7				
	7 integrate knowledge	agined on building ele	ments building physics	finishing works installati	ions and structural
	systems during prepa	ration of the detailed de	esign and working design	. Level:6.7	
	8.presentation of sem	inar. Level:6,7		,	
Methods of carrying	Ex cathedra teaching				
out lectures	Guest lecturer				
	Discussion				
	Questions and answer	S			
	Homework presentation	on			
	Other				
	Theoretical lectures, v	video presentations, dra	iwing on the board. Stude	ents have to follow lectur	es by drawings, to
Methods of carrying	Group problem colving				
out auditory	Discussion, brainstorn	y nina			
exercises	Other				
How construction	Other				
exercises are held					
Course content	1.Family residential bu	uildings: semi-detached	building - examples and	analysis, 2h, Learning o	utcomes:1,2,4
lectures	3 Apartment building	typology of buildings	- examples and analysis,	211, Learning outcomes:	1,2,4) /
	4.Apartment building:	typology of buildings, of	communication, 2h, Learr	ing outcomes:1,2,4	-,-
	5.Apartment building:	common areas in build	ings, 2h, Learning outcor	nes:1,2,4,6,7	
	6.Apartment building:	spacious apartment pr	ogram, 2h, Learning outc	omes:1,2,4	104
	7.Apartment building:	analysis of the structur	re of apartments and exa	mples, 2h, Learning outc	.omes:1,2,4
	9. Apartment building:	analysis of structures f	loors and examples. 2h. I	earning outcomes:1.2.4	UTTES.1,2,4
	10.Apartment building	: analysis of structures	floors and examples, 2h,	Learning outcomes:1,2	
	11.Apartment building	: the gallery system, 2	h, Learning outcomes:1,2	,4	
	12Apartment buildin	g: residential towers, 2	h, Learning outcomes:1,2	,4	
	13.Apartment building	g: examples of complete	ed structures, 2h, Learnin	g outcomes:1,2,4	
	15.Apartment building	a: examples of complete	ed structures, 2h, Learnin	a outcomes:1.2.4	
				5	
Course content	1.Instructions for the	preparation of assignme	ents and analysis of forme	er student assignments,	2h, Learning
auditory	outcomes:1,4				
	2				
	4				
	5				
	6				
	7				
	o g				
	10				
	11				
	12				
	13				
	14 15				
	-5				
Course content	1				
constructures	2.nIndependent elabo	ration of the second as	signment, with correction	s: residential building - p	oreliminary design, 2h,
	Learning outcomes:1,	2,4,6,7			
I	3.Independent elabora	ation of the second assi	griment, with corrections	: residential building - pr	eiiminary design, 2h,

1	Learning subsement 2.4.6.7
	4.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h,
	Learning outcomes:1,2,4,6,7 5.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h,
	Learning outcomes:1,2,4,6,7
	6.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h, Learning outcomes:1,2,4,6,7
	7.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h, Learning outcomes: 1.2.4.6.7
	8.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h, learning outcomes: 1.2.4.6.7
	9.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h, learning outcomes: 1.2.4.6.7
	10.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h, Learning outcomes: 1.2.4.6.7
	11.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h, Learning outcomes: 1.2.4.6.7
	12.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h, Learning outcomes:1,2,4,6,7
	13.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h, Learning outcomes:1,2,4,6,7
	14.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h, Learning outcomes:1,2,4,6,7
	15.Independent elaboration of the second assignment, with corrections: residential building - preliminary design, 2h, Learning outcomes:1,2,4,6
Required materials	Basic: classroom, blackboard, chalk
	Portable overhead projector
Exam literature	1.J. Bodić : Separati predavanja arhitekture 20 stoljeća 2. J. Bodić I. Ževrnja: Zgradarstvo I. priručnik za izvođenje konstrukcijskih vježbi: izbor studentskih radova iz programa
	samostojećih obiteliških zgrada
	3. Lj. Biondić: Uvod u projektiranje stambenih zgrada, Golden marketing - Tehnička knjiga, Zagreb, 2011
	4.G. Knežević, I. Kordiš: Štambene i javne zgrade (V izdanje), Tehnička knjiga , Zagreb 1981
	5.G. Knežević: Višestambene zgrade, Tehnička knjiga, Zagreb 1986
	6.E.Neufert: Elementi arhitektonskog projektiranja, Golden marketing, Zagreb 2002
	/.A.Stulhofer, Z.Versic: Crtanje arhitektonskih načrta, Pribor i osnove, UPI-2m,Zagreb1998
	o.Zakon o prostonomi uređenju i gradnji, 155/15 O Pravilnik o pristunačnosti građevjne osobama s invaliditetom i smanjene nokretljivosti NN 78/2013
	10.Oris, časopis za arhitekturu i kulturu
Students obligations	
Knowledge	
evaluation during semester	
Knowledge	
evaluation after	
semester	
Student activities:	Aktivnost ECTS
	(Project) 3
	(Written exam) 2
Kemark	I his course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have completed Zgradarstvo I Students cannot pass this course unless they have passed Zgradarstvo I
ISVU equivalents:	22384:147443:155985:
Proposal made by	
oposai made by	ŀ

Study programme	for academic	year 2018/2019
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Name Building installations i Status	Code WEB/ISVU	23942/184755	ECTS	4.0	Academic year	2018/2019
Status Stitus Stitus Stitus Stitus Teaching mode Lectures 4 exceless fauditory 4 laboratory 4 seminar 4 metodology 4 construction 30+15 (5 4+0+10) Teachers Lectures 1. Van Celinic diplingstr. Auditory exercises: Ixan Celinic diplingstr. Stitus of status and the status of th	Name	Building Installations I				
Teaching mode Lectures - exercises (audion + laboratory + seminar + metodology + construction) [2] +15 (5+0+0+1.0) Teachers Lectures - 1. Non Celtric (dpl.ing.str. Lectures - 1. Non Celtric (dpl.ing.str. Audiony exercises: Thom: Rengel [2] Genrae objectives Study of water supply and drainage incluitations. (Fre installations, and gas installations in buildings from the aspect of technologies. Study of water supply and drainage incluitations. (Fre installations, and gas installations, letphone installations, teeping here installations, supply and drainage incluitations (free installations, and gas installations, letphone installations, a terificial excitations, teeping here installations, and gas installations, letphone installations, and gas installations, and gas installations, letphone installations, and gas installations insthe respect of anaty in diving a adv dive in gas insta	Status	5th semester - Building	Construction (Redovni	graditeljstvo) - obligatory	course	
work at home [75] Eachers: Lectures1. Thom of terring dipling str. Lectures2. Thom if terring dipling str. Auditory exercises: how activity (gring str. Building, space required, and compatibility with modern solutions and building (for the appect of the function, position within the building, space required, and compatibility with modern solutions and building (for the compatibility), drainage and ago. Level 6 Z.define conditions for connecting individual buildings to mulcipal services (water supply, drainage and ago.) Level 6 Z.define conditions for connecting individual buildings to mulcipal services (stres supply, drainage and ago.) respect to individual services. Level 6 Z.define conditions for connecting individual buildings to mulcipal services (stres supply, drainage and ago.) respect to individual services. Level 6 Z.define conditions for connecting individual services with respect to other anchestrual-facturatural elements of the building. Level 6, 7 Restructs agoinficance and value of individual services with respect to indivision and installation assemblies on building projects, from the planning stage, to design and to construction work. Thermo- ecturical installations and installations, paristorming reservices are held to according the sublemented through required presentatin of a multistorey residential building with more e	Teaching mode	Lectures + exercises (a	auditory + laboratory +	seminar + metodology +	construction)	30+15 (5+0+0+10)
Teachers Lectures: 1. Van Cethin diging and between set to many damped between set to many damped between set to many damped between set to many damped between set to many damped between set between set to many damped between set to many damped between set between set to many damped between set to many damped between set between set to many damped between set to many damped between set between set to many damped between set to many damped between set between set to many damped between set to many damped between set between set to many damped between set to many damped between set between set to many damped between set to many damped between set between set to many damped between set to many damped between set building. Set to many damped between set to many damped between set building. Set to many damped between set to many damped between set building. Set to many damped between set to many damped between set building. Set to many damped between set to many damped between set building. Set to many damped between set to many damped between set building. Set to many damped between set to many damped between set to many damped between set building. Damped between set to many dampe		work at home				75
Lectures 2. In a Out mage Auditory exercises: Ind Column diplicings 3r. Auditory exercises: Ind Column diplicings 3r. Auditory exercises: Indon's Rengel Course objectives Study of water supply and drainage installations, fire installations, and gas installations in buildings from the aspect of there functions, position within the building, space required, and compatibility with modern solutions and building installations, electrical installations lipiting, electromechanical devices, lipitining installations, installations, and auditing installations, electrical installations lipiting, electromechanical devices, lipitining installations within the building, space required, and compatibility with modern solutions and building to manage and gas). Level6 Z define conditions for connecting individual buildings to municipal services (vater supply drainag and gas). Level6 Z define conditions for connecting individual buildings to municipal services (vater supply drainag and gas). Level6 Z define conditions for connecting individual buildings to municipal services (vater supply drainage and gas). Level6 Z define conditions for mole sept of their function, position devices, and network of mole from adopted gas devices, and calculate and design the chimery. Level6 Z define conditions for mole sept of their function, supply and drainage services in multistorey residential or public building. Level6, 7 Manages installation or water supply and drainage services in multistorey residential or public buildings. Level6, 7 manages installations and installations and installations and installations and installations and installations and installation advices on the service of the drain divide and through a variet of multimedia ads. Including draining and sub-sub-supply and trainage services in multistorey residential or public buildings. Level6, 7 manages installations and individual services inmultinding draining addies showing insta	Teachers	Lectures:1. Ivan Cetinic	ć dipl.ing.str.			
Auditory exercises: Them'r Regel Course objectives Study of water supply and drainage installations, fire installations, and gas installations in buildings from the aspect of their function/use, position within the building, space required, and compatibility with moder anothoring, and an construction and building their function/use, position within the building, space required, and compatibility with moder anothoring, and an construction and building their function position within the building, space required, and compatibility with moder solutions and building their function/use, position within the building, space required, and compatibility with moder solutions across they by, drainage and gas). Level 6 2, define conflicts for onnecting regulations from the aspect of stafet position within the building, space and they of use, and fire position within the spect to individual services. Level 6 3, classify building a conditions for onnecting regulations from the aspect of stafet position with the respect to individual services. Level 6 3, classify building a contain the on adopted gas devices, and calculate and design the chimey. Level 6 1, classify building a council and gas devices in multistorey residential or public buildings. Level 6, 7, 8, manage installation of water supply and drainage individual services to other architectural structural elements of the draw adopted solutions for water supply and drainage individual services in multistorey residential or public buildings. Level 6, 7, 8, manage installation assemblies on building projects, from the planning stage, to design and to construction work. However, 6, 7, 8, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7,		Lectures:2. Tinomir Rei Lectures:dr.sc. Dražen	1gei Arbutina dinl ing arb			
Auditory exercises: Thomir Rengel Course objectives Study of water supply and dranage installations, fine installations, and gas installations in buildings from the aspect of their functions, position within the building, space required, and compatibility with modern solutions and building technologies. Study of thermo-technical installations includes, diverse installations, telephone installations, building, space required, and compatibility with modern solutions and building technologies. Level 6 Learning outcomes: Lanalyze type of waste water, types of water supply systems, and gas requirements, Level 6 Scheming outcomes: Lanalyze type of waste water, dinking water, fire protection water, and gas, and network dimensioning with beliefcoin. Level 6, 7 Cost is a supply and training and the system is a supply system. Supply system, system supply system, supply system, supply system, supply system, supply system, supply system, supply system, suply system, system, supply system, system, suply sy		Auditory exercises: Iva	n Cetinić dipl.ing.str.			
Course objectives Study of water supply and drainage installations, fire installations, and gas installations in buildings from the aspect of their function/use, pastion within the building, space required, and compatibility with moder solutions and building technologies. Study of therms/technical installations (nebring), outpation, and ar conditioning), as many, as many technologies. Learning outcomest Lanalyze types of water supply of water supply systems, and gas requirements, level6 2. define conditions for connecting individual buildings to municipal services (water supply, drainage and gas). Level66 3. calculate autitions of vater water, drinking water, fine protection water, and gas, and network dimensioning with respect to individual services. Level6 or solve water, supply water, fine protection water, and gas, and network dimensioning with respect to individual services. Level6 or solve water, supply and drainage installations, fine protection installations, and gas installation or multistory residential or public buildings. Level6 7 B. comprehensive overview of water supply and drianage installation fire protection installations, and gas installations, as installations, as installations are presented orally and through a variety of multimed and issin, including drivings and sides borving installation as envelted or low out through a variety of multimed and issin, including drivings and sides borving installations, as installations, as installations, as installations, as installations, as installations, as installations arequeries of an installations, aserebles on building		Auditory exercises: Tih	omir Rengel			
Course objectives Study of water supply and drainage installations, fire installations, and as installations in buildings from the spect of ther functionse, position within the buildings, space required, and compatibility with modern solutions and building technologies. Study of therm-stechnical installations, from the spect of their function, position within the building solutions in buildings, from the spect of their function, position within the building solutions and building sechnologies. Learning outcomes: Lanalyze types of wate water, types of water supply system supply systems, and gas requirements. Level 6 2. Addine conditions for connecting individual sort multiply to functions, and are consistent of their function, position within the building. Scott and gas, and network dimensioning with respect to individual services userie 6 5. Solve evacuation of smoke from adopted gas devices, and calculate and design the chinney. Level 6 7. Solve evacuation of smoke from adopted gas devices, and calculate and design the chinney. Level 6 7. Solve evacuation of smoke from adopted gas devices with respect to other architectural-structural elements of the building, Level 6, 7. Buildings, Level 6, 7. Building architect from the planning data disc installations, and disc installations, and gas installations, and gas installations and installation second and the second gas devices in multistorey residential or public building trevers (B, 7. Building, Level 6, 7. Building, Level 6, 7. Building, Level 6, 7. Building, Building T, for the planning data disc installations, and installation submit multistorey residential proplects, from th						
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 6. Water based fire protection systems for buildings; basic principles, function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:2,5,8,9 7. Automatic fire protection systems based on gas FM 200; fire detection systems; anti-burglary and monitoring systems, 2h, Learning outcomes:3,6,8 8. Relevant legislation; external and internal hydrant networks; automatic sprinkler systems; fire fighting by gas and foam, 2h, Learning outcomes:1,4,5,7,8 9. Types of sewage and sewerage systems; typical diagram presentations; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:1,5,6,7 10. Sanitarni predmetti i ure: ergonomski uporabni prostori; prefabricirani elementi; sanitarne blok stjene i kabine., 2h, Learning outcomes:4,5,8,9 11. Vrste ure za proanje otpadnih voda; odvajamasti, ulja i benzina; sabirne i septi jame; biodisk., 2h, Learning outcomes:2,3,6 12. Sewerage piping design; equivalent factor method (DIN 1986); calculation method according to K2h, Learning outcomes:3,4,6,7 13. Gas types and uses; gas installation diagram; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:3,6,7,9 14. Types of energy-using devices, installation requirements; types and dimensioning of gas chimneys , 2h, Learning outcomes:2,4,6,9 15. Relevant legislation. Dimensioning of gas installations, 2h, Learning outcomes:2,4,6,7,8 		5.Hot water generation	design; dimensioning t	ne water supply piping ne	etwork; selection and typ	pes of pressure boosting
 elements and assemblies, 2h, Learning outcomes:2,5,8,9 7. Automatic fire protection systems based on gas FM 200; fire detection systems; anti-burglary and monitoring systems, 2h, Learning outcomes:3,6,8 8. Relevant legislation; external and internal hydrant networks; automatic sprinkler systems; fire fighting by gas and foam, 2h, Learning outcomes:1,4,5,7,8 9. Types of sewage and sewerage systems; typical diagram presentations; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:1,5,6,7 10. Sanitarni predmeti i ure: ergonomski uporabni prostori; prefabricirani elementi; sanitarne blok stjene i kabine., 2h, Learning outcomes:4,5,8,9 11. Vrste ure za proanje otpadnih voda; odvajamasti, ulja i benzina; sabirne i septi jame; biodisk., 2h, Learning outcomes:2,3,6 12. Sewerage piping design; equivalent factor method (DIN 1986); calculation method according to K2h, Learning outcomes:3,4,6,7 13. Gas types and uses; gas installation diagram; function, materials and realization of individual elements and assemblies, 2h, 9 14. Types of energy-using devices, installation requirements; types and dimensioning of gas chimneys , 2h, Learning outcomes:2,4,6,9 15. Relevant legislation. Dimensioning of gas installations, 2h, Learning outcomes:2,4,6,7,8 		6.Water based fire prot	ection systems for build	ings: basic principles, fur	nction, materials and rea	alization of individual
 7.Automatic fire protection systems based on gas FM 200; fire detection systems; anti-burglary and monitoring systems, 2h, Learning outcomes:3,6,8 8.Relevant legislation; external and internal hydrant networks; automatic sprinkler systems; fire fighting by gas and foam, 2h, Learning outcomes:1,4,5,7,8 9. Types of sewage and sewerage systems; typical diagram presentations; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:1,5,6,7 10.Sanitarni predmeti i ure: ergonomski uporabni prostori; prefabricirani element; sanitarne blok stjene i kabine., 2h, Learning outcomes:4,5,8,9 11.Vrste ure za proanje otpadnih voda; odvajamasti, ulja i benzina; sabirne i septi jame; biodisk., 2h, Learning outcomes:2,3,6 12.Sewerage piping design; equivalent factor method (DIN 1986); calculation method according to K2h, Learning outcomes:3,4,6,7 13. Gas types and uses; gas installation diagram; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:3,6,7,9 14.Types of energy-using devices, installation requirements; types and dimensioning of gas chimneys , 2h, Learning outcomes:2,4,6,9 15.Relevant legislation. Dimensioning of gas installations, 2h, Learning outcomes:2,4,6,7,8 		elements and assembli	es, 2h, Learning outcom	es:2,5,8,9		
 systems, 2h, Learning outcomes:3,6,8 8.Relevant legislation; external and internal hydrant networks; automatic sprinkler systems; fire fighting by gas and foam, 2h, Learning outcomes:1,4,5,7,8 9. Types of sewage and sewerage systems; typical diagram presentations; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:1,5,6,7 10.Sanitarni predmeti i ure: ergonomski uporabni prostori; prefabricirani elementi; sanitarne blok stjene i kabine., 2h, Learning outcomes:4,5,8,9 11.Vrste ure za proanje otpadnih voda; odvajamasti, ulja i benzina; sabirne i septi jame; biodisk., 2h, Learning outcomes:2,3,6 12.Sewerage piping design; equivalent factor method (DIN 1986); calculation method according to K2h, Learning outcomes:3,4,6,7 13. Gas types and uses; gas installation diagram; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:3,6,7,9 14.Types of energy-using devices, installation requirements; types and dimensioning of gas chimneys , 2h, Learning outcomes:2,4,6,9 15.Relevant legislation. Dimensioning of gas installations, 2h, Learning outcomes:2,4,6,7,8 		7.Automatic fire protec	tion systems based on g	as FM 200; fire detection	n systems; anti-burglary	and monitoring
 8.Relevant legislation; external and internal hydrant networks; automatic sprinkler systems; fire fighting by gas and foam, 2h, Learning outcomes:1,4,5,7,8 9. Types of sewage and sewerage systems; typical diagram presentations; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:1,5,6,7 10.Sanitarni predmeti i ure: ergonomski uporabni prostori; prefabricirani elementi; sanitarne blok stjene i kabine., 2h, Learning outcomes:4,5,8,9 11.Vrste ure za proanje otpadnih voda; odvajamasti, ulja i benzina; sabirne i septi jame; biodisk., 2h, Learning outcomes:2,3,6 12.Sewerage piping design; equivalent factor method (DIN 1986); calculation method according to K2h, Learning outcomes:3,4,6,7 13. Gas types and uses; gas installation diagram; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:3,6,7,9 14.Types of energy-using devices, installation requirements; types and dimensioning of gas chimneys , 2h, Learning outcomes:2,4,6,9 15.Relevant legislation. Dimensioning of gas installations, 2h, Learning outcomes:2,4,6,7,8 		systems, 2h, Learning (outcomes:3,6,8		· · · · · · · · · · · · · · · · · · ·	с. н.:
 9. Types of sewage and sewerage systems; typical diagram presentations; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:1,5,6,7 10.Sanitarni predmeti i ure: ergonomski uporabni prostori; prefabricirani elementi; sanitarne blok stjene i kabine., 2h, Learning outcomes:4,5,8,9 11.Vrste ure za proanje otpadnih voda; odvajamasti, ulja i benzina; sabirne i septi jame; biodisk., 2h, Learning outcomes:2,3,6 12.Sewerage piping design; equivalent factor method (DIN 1986); calculation method according to K2h, Learning outcomes:3,4,6,7 13. Gas types and uses; gas installation diagram; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:3,6,7,9 14.Types of energy-using devices, installation requirements; types and dimensioning of gas chimneys , 2h, Learning outcomes:2,4,6,9 15.Relevant legislation. Dimensioning of gas installations, 2h, Learning outcomes:2,4,6,7,8 		6.Relevant legislation;	external and internal ny	drant networks; automat	ic sprinkler systems; fire	e fighting by gas and
 individual elements and assemblies, 2h, Learning outcomes:1,5,6,7 10.Sanitarni predmeti i ure: ergonomski uporabni prostori; prefabricirani elementi; sanitarne blok stjene i kabine., 2h, Learning outcomes:4,5,8,9 11.Vrste ure za proanje otpadnih voda; odvajamasti, ulja i benzina; sabirne i septi jame; biodisk., 2h, Learning outcomes:2,3,6 12.Sewerage piping design; equivalent factor method (DIN 1986); calculation method according to K2h, Learning outcomes:3,4,6,7 13. Gas types and uses; gas installation diagram; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:3,6,7,9 14.Types of energy-using devices, installation requirements; types and dimensioning of gas chimneys , 2h, Learning outcomes:2,4,6,9 15.Relevant legislation. Dimensioning of gas installations, 2h, Learning outcomes:2,4,6,7,8 		9. Types of sewage and	d sewerage systems: typ	ical diagram presentatio	ns: function. materials a	nd realization of
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 13. Gas types and uses; gas installation diagram; function, materials and realization of individual elements and assemblies, 2h, Learning outcomes:3,6,7,9 14.Types of energy-using devices, installation requirements; types and dimensioning of gas chimneys , 2h, Learning outcomes:2,4,6,9 15.Relevant legislation. Dimensioning of gas installations, 2h, Learning outcomes:2,4,6,7,8 		outcomes:3,4,6,7				
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outcomes:2,4,6,9 15.Relevant legislation. Dimensioning of gas installations, 2h, Learning outcomes:2,4,6,7,8		assemblies, 2h, Learnir	ng outcomes:3,6,7,9	equirements types and	dimensioning of and ship	mneve 2h Learning
15.Relevant legislation. Dimensioning of gas installations, 2h, Learning outcomes:2,4,6,7,8		outcomes:2.4.6.9	ny devices, ilistaliation i	equitements, types dilu	unitensioning of gas CIII	nineys, 211, Leanning
		15.Relevant legislation	. Dimensioning of gas in	stallations, 2h, Learning	outcomes:2,4,6,7,8	
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Course content	1.Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1h,
auditory	2.Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1h,
	Learning outcomes:1,2,3,4,5
	Learning outcomes:1,2,3,4,5
	4. Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1h,
	Learning outcomes:1,2,3,4,5 5.Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1h,
	Learning outcomes:1,2,3,4,5
	6.Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1h, I earning outcomes: 1.2.3.4.5
	7. Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1h,
	Learning outcomes:1,2,3,4,5 8 Presentation of solutions to installations problems based on a concrete example from civil engineering practice 1h
	Learning outcomes:1,2,3,4,5
	9.no clas, Learning outcomes:1,2,3,4,5
	11.no clas, Learning outcomes:1,2,3,4,5
	12.no clas, Learning outcomes:1,2,3,4,5
	14.no clas, Learning outcomes:1,2,3,4,5 14.no clas, Learning outcomes:1,2,3,4,5
	15.no clas, Learning outcomes:1,2,3,4,5
Course content	1. Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1h,
constructures	Learning outcomes:1,2,3,4,5,6
	Learning outcomes:1,2,4,5
	3.Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1h,
	Learning outcomes:1,2,3,4,5 4.Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1h,
	Learning outcomes:1,2,3,4,5
	5.Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1n, Learning outcomes:1.2.3.4.5
	6.Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1h,
	Learning outcomes:1,2,3,4,5 7. Presentation of solutions to installations problems based on a concrete example from civil engineering practice., 1h,
	Learning outcomes:1,2,3,4,5
	8.no clas 9.no clas
	10.no clas
	11.no clas
	13.no clas
	14.no clas
Required materials	Basic: classroom, blackboard, chalk
	Overhead projector
	Video equipment
Exam literature	Basic literature:
	1. Cetinić,I:Vodovod, radni materijal- Skripte predavanja i vježbe 2. Cetinić I:Kanalizacija, radni materijal- Skripte predavanja i vježbe
	3. Cetinić,I:Plinske instalacije, radni materijal- Skripte predavanja i vježbe 4. Cetinić,I:Grijanje, radni materijal-
	Predavanja 5. Cetinić I:Hlađenje, ventilacija i klimatizacija, radni materijal, Skrinte predavanja i vježbe
	6. Cetinić,l:Električne instalacije, radni materijal- Skripte predavanja i vježbe
	7. Cetinić, l: Instalacije grijanja i elektrike, radni materijal- Skripte vježbe
	1. Radonjić, M.: Vodovod i kanalizacija u zgradama, Croatiaknjiga, 2004.
	2. Tušar, B.: Kućna kanalizacija, Građevinski fakultet, 2001. 3. Tučar, B.: knučtanja i pročičćavanja otradno voda. Grastiaknjiga, 2004.
	4. Tadić,D.: Kućne instalacije, BGZ, Beograd, 1963.
	5. Strelec i suradnici: Plinarski priručnik, Energetika marketing, Zagreb , 2001 6. Boskagask Sprange, Schramaky, Priružnik za grijanja, blađanja, vontilaciju i klimatizaciju. V Banja, 2002
	7. Labudović i suradnici: Priručnik za ventilaciju i klimatizaciju,Energetika marketing, Zagreb , 2000.
	8. Podlipnik, B : Svjetlotehnički priručnik, Elektrokovina, Maribor, 1978.
Students obligations	maximum of 3 absences from exercises Redovitost pobaa#10#0#50\$Kolokvii, numeri zadaci#1#50#60\$Kolokvii, teoriiska pitapia#1#50#60\$
evaluation during	
semester	
Knowledge evaluation after	Assignment verification, Written and oral examination: written part of the examination consists of ten questions: oral examination may be taken
semester	by
	students that obtained at least 60 percent of points during the written part of the examination.



Zagreb University of Applied Sciences

Student activities:	Aktivnost (Classes attendance) (Written exam) (Oral exam)	ECTS 1 2 1	
Remark	This course can be used for final thesi	s theme	
Prerequisites:	Students cannot enroll in this course ι Students cannot enroll in this course ι	inless they have passed Građevinski materijali inless they have completed Betonske konstrukcije II	
ISVU equivalents:	22385;155937;		
Proposal made by	v.predavač Ivan Cetinić, 18.6.2012		

Code WEB/ISVU	23946/184759	ECTS	4.0	Academic year	2018/2019
Name	Building Installations II				
Status	6th semester - Building	g Construction (Redovni g	raditeljstvo) - obligatory	course	
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + s	eminar + metodology +	construction)	30+15 (5+0+0+10) 75
Teachers	Lectures:1. Ivan Cetinio Lectures:2. Tihomir Re Lectures:dr.sc. Dražen Auditory exercises: Tih Construction exercises	ć dipl.ing.str. ngel Arbutina dipl.ing.arh. omir Rengel : Tihomir Rengel			F.2
Course objectives	Study of thermo-techn (lighting, electromecha transport installations compatibility with mod	ical installations (heating anical devices, lightning in in buildings, from the asp lern solutions and building	, cooling, ventilation, and nstallations, telephone ir lect of their function, pos g technologies.	d air conditioning), elect nstallations, aerial syster sition within the building	rical installations ms) and vertical- , space required, and
Learning outcomes: Methods of carrying	1.define microclimatic Level:6 2.use approximation m Level:6,7 3.analyse application of requirement and susta 4.make distinction beth Level:6 5.compare different so 6.propose an optimum 7.comment on solution 8.plan installation of a occupancy. Level:6,7 9.insert heating, coolin building. Level:6 10.define lighting for a Level:6 11.plan the type and n Ex cathedra teaching Case studios	conditions and hygienic b nethods to estimate losse of a heating, cooling, vent inable construction. Leve ween heating bodies base urces of thermal and coo source of energy from th as adopted for weak and h spare electric generator ag, ventilation, air conditi building depending on th umber of elevators in a b	bases of the area depend s and inflows of heat as illation or air conditioning l:6 ed on material used, geo ling energy depending o le standpoint of environr neavy electricity installat in a building depending o oning, and electricity so ne occupancy of individu uilding depending on its	ding on the buildings loc. needed to design power g system as related to the metrical properties, and in the primary energy co mental protection. Level: tions in a building. Level on the type of installatio lutions in plans and sche al rooms and the type of occupancy and size. Level	ation and occupancy. facilities of a building. ne buildings energy I place of installation. Insumption. Level:6,7 :6,7 :6 ins and building ematic diagrams of a f lighting fixtures. vel:6,7
out lectures	Case studies Discussion Questions and answers	5			
Methods of carrying out auditory exercises	Group problem solving Traditional literature a Discussion, brainstorm Computer simulations Interactive problem so	nalysis ing Iving			
How construction exercises are held	Group problem solving Workshop				
Course content lectures	1.Thermo-technical, ga drawings and slides sh realization., 2h, Learnin 2.Thermo-technical, ga drawings and slides sh realization., 2h, Learnin 3.Thermo-technical, ga drawings and slides sh realization., 2h, Learnin 4.Thermo-technical, ga drawings and slides sh realization., 2h, Learnin 5.Thermo-technical, ga drawings and slides sh realization., 2h, Learnin 6.Thermo-technical, ga drawings and slides sh realization., 2h, Learnin 7.Thermo-technical, ga drawings and slides sh realization., 2h, Learnin 8.Thermo-technical, ga drawings and slides sh realization., 2h, Learnin 8.Thermo-technical, ga drawings and slides sh realization., 2h, Learnin 9.Thermo-technical, ga drawings and slides sh realization., 2h, Learnin 10.Thermo-technical, ga drawings and slides sh	as and electricity installat owing installations and in ng outcomes:1,2,3,4,5,6, is and electricity installat owing installations and in ng outcomes:1,2 is and electricity installat owing installations and in ng outcomes:3,4 is and electricity installat owing installations and in ng outcomes:5,6 is and electricity installat owing installations and in ng outcomes:7,8 is and electricity installat owing installations and in ng outcomes:7,8 is and electricity installat owing installations and in ng outcomes:9,10 is and electricity installat owing installations and in ng outcomes:11 as and electricity installat owing installations and in ng outcomes:1,2 is and electricity installat owing installations and in ng outcomes:3,4 gas and electricity installat showing installations and	ions are explained orally istallation assemblies on 7,8,9,10,11 ions are explained orally istallation assemblies on ions are explained orally istallation assemblies on	and through multimedia structures/buildings, fro and through multimedia structures/buildings, fro	a, with abundant use of om design to a, with abundant use of om design to dia, with abundant use of om design to dia, with abundant use of om design to

	 11.Thermo-technical, gas and electricity installations are explained orally and through multimedia, with abundant use of drawings and slides showing installations and installation assemblies on structures/buildings, from design to realization., 2h, Learning outcomes:7,8 12.Thermo-technical, gas and electricity installations are explained orally and through multimedia, with abundant use of drawings and slides showing installations and installation assemblies on structures/buildings, from design to realization., 2h, Learning outcomes:9,10 13.Thermo-technical, gas and electricity installations are explained orally and through multimedia, with abundant use of drawings and slides showing installations and installation assemblies on structures/buildings, from design to realization., 2h, Learning outcomes:11 14.Thermo-technical, gas and electricity installations are explained orally and through multimedia, with abundant use of drawings and slides showing installations and installation assemblies on structures/buildings, from design to realization., 2h, Learning outcomes:11 14.Thermo-technical, gas and electricity installations are explained orally and through multimedia, with abundant use of drawings and slides showing installations and installation assemblies on structures/buildings, from design to realization., 2h, Learning outcomes:1,2,3,4 15.Thermo-technical, gas and electricity installations are explained orally and through multimedia, with abundant use of drawings and slides showing installations and installation assemblies on structures/buildings, from design to realization., 2h, Learning outcomes:1,2,3,4 15.Thermo-technical, gas and electricity installations are explained orally and through multimedia, with abundant use of drawings and slides showing installations and installation assemblies on structures/buildings, from design to realization., 2h, Learning outcomes:5,6,7,8,9,10
Course content auditory	1. The program assignment is realized on existing documents for a multistorey building with more than six housing units. Heating, ventilation, gas and electricity installations are solved. The selection and dimensioning of the heating system, ventilation, gas and electricity installations in form of plan views and diagrams. Students are required to defend/justify their concepts relating to heating and electricity installations. The solution adopted has to be justified when the program assignment is realized on existing documents for a multistorey building with more than six housing units. Heating, ventilation, gas and electricity installations are solved. The selection and dimensioning of the heating system, ventilation, gas and electricity installations are solved. The selection and dimensioning of the heating system, ventilation, gas and electricity installations in form of plan views and diagrams. Students are required to defend/justify their concepts relating to heating and electricity installations. The solution adopted has to be justified when the program assignment is submitted to the lecturer. In. Learning outcomes:1,2,3 and lighting; presentation of installations in form of plan views and diagrams. Students are required to defend/justify their concepts relating to heating and electricity installations. The solution adopted has to be justified when the program assignment is submitted to the lecturer. In. Learning outcomes:1,2,3 d and plating, presentation of installations in form of plan views and diagrams. Students are required to defend/justify their concepts relating to heating and electricity installations. The solution adopted has to be justified when the program assignment is submitted to the lecturer. In. Learning outcomes:1,2,3,4 d The program assignment is realized on existing documents for a multistorey building with more than six housing units. Heating, ventilation, gas and lighting; presentation of installations in form of plan views and diagrams. Students are required to defend/justify thei
Course content constructures	 1.no class, Learning outcomes:1,2,3 2.no class, Learning outcomes:4,5,6 3.no class, Learning outcomes:7,8,9 4.no class, Learning outcomes:1,2,3 6.no class, Learning outcomes:4,5,6 7.no class, Learning outcomes:7,8,9 8.no class, Learning outcomes:10,11 9.The program assignment is realized on existing documents for a multistorey building with more than six housing units. Heating, ventilation, gas and electricity installations are solved. The selection and dimensioning of the heating system, ventilation, gas and lighting; presentation of installations in form of plan views and diagrams. Students are required to defend/justify their concepts relating to heating and electricity installations. The solution adopted has to be justified when the program assignment is realized on existing documents for a multistorey building with more than six housing units. Heating, ventilation, gas and electricity installations are solved. The selection and dimensioning of the heating system, ventilation, gas and electricity installations in form of plan views and diagrams. Students are required to defend/justify their concepts relating to heating and electricity installations. The solution adopted has to be justified when the program assignment is submitted to the lecturer. 1, 1, Learning outcomes:1,2,3 10.The program assignment is realized on existing documents for a multistorey building with more than six housing units. Heating, ventilation, gas and electricity installations are solved. The selection and dimensioning of the heating

system, ventilation, gas and lighting; presentation of installations in form of plan views and diagrams. Students are
required to defend/justify their concepts relating to heating and electricity installations. The solution adopted has to be
Justified when the program assignment is submitted to the lecturer., 1h, Learning outcomes:4,5,6
11. The program assignment is realized on existing documents for a multistorey building with more than six housing
units. Heating, ventilation, gas and electricity installations are solved. The selection and dimensioning of the heating
system, ventilation, gas and lighting; presentation of installations in form of plan views and diagrams. Students are
required to defend/justify their concepts relating to heating and electricity installations. The solution adopted has to be
justified when the program assignment is submitted to the lecturer., 1h, Learning outcomes:7,8,9
12. The program assignment is realized on existing documents for a multistorey building with more than six housing
units. Heating, ventilation, gas and electricity installations are solved. The selection and dimensioning of the heating
system, ventilation, gas and lighting; presentation of installations in form of plan views and diagrams. Students are
required to defend/justify their concepts relating to heating and electricity installations. The solution adopted has to be
Justified when the program assignment is submitted to the lecturer., 1h, Learning outcomes:10,11
13. The program assignment is realized on existing documents for a multistorey building with more than six housing
units. Heating, ventilation, gas and electricity installations are solved. The selection and dimensioning of the heating
system, ventilation, gas and lighting; presentation of installations in form of plan views and diagrams. Students are
required to defend/justify their concepts relating to heating and electricity installations. The solution adopted has to be
Justified when the program assignment is submitted to the lecturer., 1n, Learning outcomes:1,2,3
14. The program assignment is realized on existing documents for a multistorey building with more than six nousing
units. Heating, ventilation, gas and electricity installations are solved. The selection and dimensioning of the neating
system, ventilation, gas and lighting; presentation or instantations in form or plan views and diagrams. Students are
included to defend/justify their concepts relating to heating and electricity instantions. The solution adopted has to be
Justined when the program assignment is submitted to the fecturer, 11, Learning building with more than eix bouring
13. The program assignment is realized on existing documents for a multistorey building with more trian six housing units. Housing as and electricity installations are called. The coloring administration is the besting
units, nearing, ventilation, gas and electricity installations are solved. The selection and dimensioning of the heating
system, vertiliation, gas and infining, presentation of installations in form of plan views and utagrants. Students are
included when the program assignment is submitted to the lacturer. The Lacroing outcomes:7.8.0
Justified when the program assignment is submitted to the fecturer, in, ceaning outcomes. (), (),
Basic: classroom, blackboard, chalk
Whiteboard with markers
Overhead projector
Video equipment
Cetinić,I:Grijanje, radni materijal-Predavanja
Cetinić,I:Hlađenje, ventilacija i klimatizacija, radni materijal- Skripte predavanja i vježbe
Cetinić,I:Električne instalacije, radni materijal- Skripte predavanja i vježbe
Cetinić,I:Instalacije grijanja i elektrike, radni materijal- Skripte vježbe
maximum of 2 abconcos from aversions
maximum of absences nom exercises
reduvitos poladar 10 % 0 % 00 % 00 % 00 % 0 % 0 % 0 % 0 %
Written exam#1#50#50\$Oral exam#1#50#50\$
Aktivnost ECTS
(Classes attendance) 1
(Written exam) 2
(Oral exam) 1
This course can be used for final thesis theme
Students cannot pass this course unless they have passed Instalacije zgrada I
Students cannot enroll in this course unless they have completed Instalacije zgrada I
Students cannot enroll in this course unless they have completed Instalacije zgrada I
Students cannot enroll in this course unless they have completed Instalacije zgrada I 39177;155938;

Code WEB/ISVU	23348/147425	ECTS	2.0	Academic year	2018/2019
Name	Computer Use in Civil	Engineering	•		-
Status	1st semester - Underg	raduate professional stud	dy in civil engineering (Re	edovni graditeljstvo) - ob	ligatory course
Teaching mode	Lectures + exercises (auditory + laboratory +	seminar + metodology +	construction)	15+15 (0+15+0+0)
Toochors	work at nome	Cukov dialing grad			30
reachers	Lectures:dr.sc. Dalibor	Gelo mag.ing.aedif.			
	Lectures:dr.sc. Mandi	Orlić Bachler v.pred			
	Laboratory exercises:	lr.sc. Igor Gukov , dipl.ing	g.građ.		
Course objectives	Laboratory exercises:	Ivan Volaric struc.spec.in	g.aedif.	ation of computers and	application coffware in
course objectives	civil engineering and a	architecture.	e and skills on the applic	action of computers and	application soltware in
Learning outcomes:	1.To determine the po	ssibility of application pro	ogramming languages to	solve various problems	in civil engineering,
	architecture and math	ematics. Level:7			
	2.Develop skills techni	cal and information com	munication and use of te	chnical information and	documentation.
	3. Make technical draw	ings using CAD software	Level:6		
	4.Calculate the value of	of simple mathematical e	xpressions. Level:6		
	5.Solve systems of equ	uations. Level:6			
	6.Solve the matrix calc	culus. Level:6	a defined on the seament	t Level:6	
	8.Calculate derivatives	s and integrate real funct	ions of a real variable. Le	evel:6	
	9.Solve equations with	one unknown, ordinary	differential equations and	d certain integrals corres	sponding numerical
	methods. Level:6				
Mothods of corruing	Ex cathodra toaching				
out lectures	Demonstration				
	Simulations				
Methods of carrying	Laboratory exercises of	on laboratory equipment			
exercises	Group problem solving	computer simulations			
	Traditional literature a	, nalysis			
	Data mining and know	ledge discovery on the V	/eb		
	Computer simulations				
Course content	1.Introduction to come	outers, 1h. Learning outco	omes:1.2		
lectures	2.Basics of operating s	systems. Ubuntu and Ope	enOffice, 1h, Learning out	tcomes:1,2	
	3.Application of compu	uters in civil engineering	and architecture, 1h, Lea	arning outcomes:1,2	
	4.CAD programs. BIM a	and REVIT, 1h, Learning outcome	outcomes:1,2		
	6.Programming and pr	ogramming languages. V	Veb programming, 1h. Le	earning outcomes:1.2	
	7.Introduction to Pytho	on, 1h, Learning outcome	s:1,2	5	
	8.Database and SQL, 1	Lh, Learning outcomes:1,	2 nutan nanahira 16 karan		
	10.Fundamentals of co	omputer graphics: 3D com	ng and animation . 1h. Lear	earning outcomes:1,2	
	11.Raster and vector g	graphics. Vectorization of	raster files, 1h, Learning	outcomes:1,2	
	12.Artificial intelligenc	e , 1h, Learning outcome	s:1,2		
	13.Application of comp	outers in mathematics, 1	n, Learning outcomes:1,2	2 •1	
	15.Introduction to Max	tima, 1h, Learning outcor	nes:1	.1	
Course content	1.AutoCad: Drawing To	ools and Editing, 1h, Lear	ning outcomes:3		
laboratory	2.AutoCad: Dimension	ing and hatching, 1h, Lea ith blocks and attributes	arning outcomes:3	2	
	4.AutoCad: Working w	ith layers. Print drawing,	1h, Learning outcomes:3	}	
	5.AutoCad: Drawing in	plane, 1h, Learning out	omes:3		
	6.AutoCad: Drawing in	space, 1h, Learning out	comes:3		
	8.The first colloquium	(AutoCad). 1h. Learning	outcomes:1.2.3		
	9.Maxima: Special cha	racters, lists, arithmetic	operations, functions, 1h	, Learning outcomes:4	
	10.Maxima and Excel:	Equations with one unkn	own, systems of equatio	ns, 1h, Learning outcom	es:5
	11.Maxima and Excel:	Matrix calculation, 1h, Le	earning outcomes:6		
	13.Maxima: Differentia	al and integral calculus, 1	h, Learning outcomes:8		
	14.Maxima and Excel::	Numerical methods - Nu	imerical integration, Eule	er method, Newton meth	od, 1h, Learning
	outcomes:9	ium (Mauima and Eural)	1 h .	4 5 6 7 0 0	
	15. The second colloqu	ium (Maxima and Excei),	In, Learning outcomes:	4,5,0,7,6,9	
Required materials	Basic: classroom, blac	kboard, chalk			
	General purpose comp	outer laboratory			
-					
Exam literature	Ubavezna:		IT 2010 Zagrah 2000		
	Additional literature:	AUDCAD 2010 I AULOCAD	LI 2010, Zayien, 2009.		
	1. B. Burchard, D. Pitze	er AutoCAD 2002: napred	lne tehnike, Zagreb, 200	3.	
I	2. E. Finkelstein: Auto	CAD 2012 and AutoCAD L	T 2012 Bible, 2012.		

	 D. Abbott: AutoCAD, Zagreb, 2007. Maxima: http://maxima.sourceforge.net/ B. Kovačić: Matematički alati u elektrotehnici, udžbenik, Tehničko veleučilište u Zagrebu, Zagreb, 2013. S. Suljagić: Matematika II, skripta, 2006. http://nastava.tvz.hr/ssuljagic/ J. Liberty: Programiranje Visual Basic 2005, Zagreb, 2006. Y. Fain: Programiranje Java, Zagreb, 2011. I. Griffiths, M. Adams, J. Liberty: Programiranje C 4.0, Zagreb, 2011.
Students obligations	It is required to achieve at least 30 points during the semester.
Knowledge evaluation during semester	During the semester it is possible to achieve a maximum of 60 points, as follows: - two tests (each is valid 15 points): 30 points, - course completed: 30 points. By achieving at least 16 points (8 points from each test), a student is qualified for the oral exam, which is obligatory.
Knowledge evaluation after semester	At the exam it is possible to achieve a maximum of 40 points. On examination it is possible to achieve a maximum of 40 points. The exam consists of written (for students with less than 53% of points achieved through tests) and an oral part.
Student activities:	Aktivnost ECTS (Constantly tested knowledge) 2
Remark	This course can not be used for final thesis theme
Prerequisites:	No prerequisites.
Proposal made by	Mandi Orlić Bachler, Igor Gukov, 14.6.2017.

Code WEB/ISVU 23429/155926	ECTS	5.0	Academic year	2018/2019
Name Concrete Structures I			•	•
Status 3rd semester - Under	graduate professio	onal study in civil engine	eering (Redovni graditeljstvo) -	obligatory course
Teaching mode Lectures + exercises work at home	(auditory + labora	tory + seminar + meto	dology + construction)	30+30 (10+0+0+20) 90
Teachers Lectures:1. dr.sc. lgor	Gukov . dipl.ing.c	ırađ.		
Auditory exercises:dr	sc. Igor Gukov , d	ipl.ing.građ.		
Auditory exercises: D	alibor Mačkić			
Construction exercise	s:dr.sc. Igor Guko	v , dipl.ing.građ.		
Construction exercise	S: Dalibor Mackic		les for the such wis and desire	of one one to obviously used
Course objectives Students acquire appl	ropriate theoretica	at and practical knowled	ige for the analysis and design	of concrete structures.
2 calculate a simpler	es acting on concr design model for a	ete structure. Levei:o a concrete structure. Le	vel·6	
3.check load-bearing	capacity of an ele	ment according to the l	imit state method. Level:6	
4.sketch reinforcemen	nt details for a cor	crete structure. Level:6	5	
5.draw bending scheo	lules for beams, sl	abs, walls and columns	. Level:6	
Methods of carrying Ex cathedra teaching				
Simulations				
Modelling				
Lectures are presente	d orally, using ap	propriate technical aids	. Design models are presented	and used to explain
physical states. Durin	g lectures, studen	ts are asked relevant q	uestions so as to motivate the	m to think and to make
decisions similar to th	ose to be made in	their future work.		
Methods of carrying Laboratory exercises,	computer simulat	ions		
exercises Data mining and know	vledae discovery o	on the Web		
Computer simulations	icage alsovery c			
Students are prepared	d for the preparati	on of the program. Indi	vidual portions of the program	are shown on selected
examples, with a part	icular emphasis o	n the dimensioning and	elaboration of bending schedu	ıle.
How construction Laboratory exercises,	computer simulat	ions		
exercises are held Iraditional literature a	analysis wladga discovery o	n tha Wah		
	sieuge discovery (
Students prepare pro-	grams and are ass	isted in this task by the	e lecturer.	
Course content 1.General of concrete	structures. Basic	concepts of reinforced	concrete. Advantages and disa	dvantages of reinforced
lectures concrete., 2h, Learnin	g outcomes:2			
2.Physical and mecha	nical properties of	f concrete and reinforci	ng steel. Strength and type of	concrete and rebar., 2h,
Learning outcomes:2	concrete and reha	or Anchoring and chan	a of rainforcomant. The protoc	tive layers. The hudget
ranges. 2h. Learning	outcomes:2	an. Anchonny, and shap	e of feilliorcement. The protec	tive layers. The budget
4.Action on the struct	ure., 2h, Learning	outcomes:1		
5.Basic assumptions of	of the budget. Dim	ensioning of reinforced	concrete structures to limit st	ate design. Safety factors.
Numerical values of a	ction., 2h, Learnin	g outcomes:3,4		
6.Budget elements su	bjected to bendin	g moment. The minimu	m and maximum size of the va	aive., 2n, Learning
7.Doubly reinforced r	ectangular cross-s	ection. Budget T- beam	shaped cross section 2h. Lea	arning outcomes:3.4.5
8.Elements subjected	longitudinal force	. Centric subjected eler	nents. Subjected to centric ten	sile elements. The
minimum surface rein	forcement pillar.,	2h, Learning outcomes	:3,4	
9.Plates bearing in on	e and two directio	ns , opening plate. Sler	ider elements subjected to ecc	entric compressive force.
10 Sizing section of th	2n, Learning outco	ure and traction. Sizing	rectangular section using inter	raction diagrams 2h
Learning outcomes:3,	4	are and traction. Sizing	rectangular section using inter	
11.Sizing elements su	bjected to transve	erse forces., 2h, Learnin	ig outcomes:3,4,5	
12.Sizing elements su	bjected to torque.	The second colloquium	n., 2h, Learning outcomes:3,4,	5
13.Budget panel punc	ching. Local compr	essive stresses., 2h, Le	arning outcomes:3,4	
15.Recap material. Th	e third colloquium		es:3	
		, , 5		
Course content 1.Technical descriptic	n, drawings formv	vork and plan position.	, 1h, Learning outcomes:1	
auditory 2.Calculation slab pos	itions 201-201. Ar	alysis of the load. , 1h,	Learning outcomes:1	
3.Structural analysis s	h positions 201-20	201., In, Learning out	comes:4	
5. Slab reinforcement	drawing for positio	ons 201-201 1h. Learn	ning outcomes:4.5	
6.Analysis of the load	beam positions 20	02-202. , 1h, Learning c	outcomes:1	
7.Structural analysis h	beam positions 20	2-202. , 1h, Learning ou	itcomes:2	
8.Calculation longitud	inal reinforcemen	t beams positions 202-2	202. , 1h, Learning outcomes:3	,4
9.Calculation transver	se reinforcement	positions 202-202. , 1h	, Learning outcomes: 3,4	
11 Calculation longitu	dinal and transve	rse reinforcement for h	pam position 203 1h Learning	a outcomes 3.4
12.Beam reinforceme	nt drawing for pos	ition 203., 1h, Learning	outcomes:4,5	,,.
13.Calculation, load a	nalysis, structural	analysis and dimension	ning of column. , 1h, Learning o	outcomes:1,3
14.Column reinforcem	nent drawing., 1h,	Learning outcomes:4,5	amaa.E	
15.View and delivery	or the overall prog	gram, in, learning out	Lomes:5	
Course content 1 Technical description	n. drawings form	vork and plan position	. 1h. Learning outcomes 1	
	,		,	

	3.Structural analysis slab positions 201-201. , 1h, Learning outcomes:4
	4.Dimensioning of slab positions 201-201. , 1h, Learning outcomes:4
	5.Slab reinforcement drawing for positions 201-201. , 1h, Learning outcomes:4,5
	6.Analysis of the load beam positions 202-202. , 1h, Learning outcomes:1
	/.Structural analysis beam positions 202-202. , 1h, Learning outcomes:2
	8.Calculation longitudinal reinforcement beams positions 202-202. , 1h, Learning outcomes: 3,4
	9. Calculation transverse reinforcement positions 202-202. , 1h, Learning outcomes: 3,4
	10. Analysis of load and structural analysis for beam position 203., Lh, Learning outcomes: 1,2
	11. Calculation longitudinal and transverse reinforcement for beam position 203., In, Learning outcomes: 3,4
	12. Seam removement drawing for position 203., 1n, Learning outcomes:4,5
	13. Calculation, load analysis, structural analysis and dimensioning of column. , 1n, Learning outcomes:1,3
	14. Column reinforcement of awing, 11, Learning outcomes:4,5
	15. View and derivery of the overall program, 11, Learning outcomes.5
Required materials	Basic: classroom, blackboard, chalk
	Overhead projector
Fuene literations	Ontroume
Exam literature	Usnovna: 1. Gukov I.: Botonska konstrukcija I. Skripta Tohničkog volgučilišta u Zagrobu. Zagrob. 2010.
	1. Oukov, n. betoniske konstrukcije i. Skripta refinickog veledcinsta u zagrebu. Zagrebu z010. 2. Sorić 7. Višičak T. Botanako konstrukcije I. Svoučiličita u Zagrabu (Građovijaki fakultat Zagrab 2014)
	2. Solit, Z., Nalek, I., Betonske Konstrukcije I. Svedeniška u Zagrebu. Gradevinski rakutet, Zagreb, 2014. 3. Badić I. i curadnici: Batonske Konstrukcije Priručnik Hrvatska svedičilična naklada. Svedičilična u Zagrabu
	Građeviji, J. i suradnici. Beconske konske konstancije i matema zaka svedenišna naklada, svedenište u Zagrebu, Građevijeki fakulteti SECON HNDK Andris Zagreb 2006
	A Radić Li suradnici. Betonske Konstrukcjie Biječeni primjeri. Hrvatska sveučilišna naklada, Sveučilište u Zagrebu
	Građeviji i osradnih ozvorski rakova najevili primjeri, m raka svedenska nakada, svedenske u zagreba, Građevila,
	5. Behaim, B.: Armirani beton, Ars nova, Zagreb, 2010.
	Dodatna:
	6. HRN EN 1990:2011, Eurokod, Osnove projektiranja konstrukcija + nacionalni dodatak.
	7. HRN EN 1991:2012. Eurokod 1. Dielovania na konstrukcije + nacionalni dodatak.
	8. HRN EN 1992:2013. Eurokod 2. Projektiranje betonskih konstrukcija + nacionalni dodatak.
	9. HRN EN 1998:2011. Eurokod 8. Projektiranje potresne otpornosti konstrukcija + nacionalni dodatak.
	10. Tehnički propis za betonske konstrukcije, 2009.
Students obligations	Maximum of 3 absences from exercises.
Knowledge	Redovitost pohaa. Kolokvij. Numeri zadaci. Teorijska pitanja. Seminarski rad.
evaluation during	
semester	
Knowledge	Program approval is a prerequisite for the lecturer's second signature.
evaluation after	Written examination covering theory and problems presented during exercises.
semester	Oral examination (this examination may be taken only by students that solved at least 50% of problems during the
	written examination).
Student activities:	Aktivnost ECTS
	(Oral exam) 2
	(Seminar Work) 1
	(Constantly tested knowledge)
	(Written exam) 1
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have passed Matematika I
	Students cannot enroll in this course unless they have completed Gradevinski materijali
	Students cannot enroll in this course unless they have passed Nacritia geometrija u graditeljstvu i
	Students cannot enrol in this course unless they have completed Frondult Konstrukcija Students cannot nass this course unless they have nasced Prozenius konstrukcija
	Searches cannot pass this course threes they have passed i foracult konstrukcija
ISVU equivalents:	22348;

Code WEB/ISVU	23430/155927	ECTS	5.0	Academic year	2018/2019
Name	Concrete Structures II	•	•		
Status	4th semester - Undergr	raduate professional stud	dy in civil engineering (R	edovni graditeljstvo) - el	ective course
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + s	seminar + metodology +	· construction)	30+30 (10+20+0+0) 90
Teachers	Lectures:1. dr.sc. Igor (Auditory exercises:dr.s Auditory exercises: Iva Laboratory exercises:d Laboratory exercises: I	Gukov , dipl.ing.građ. c. Igor Gukov , dipl.ing.g n Volarić struč.spec.ing.a r.sc. Igor Gukov , dipl.ing van Volarić struč.spec.in	rađ. aedif. g.građ. g.aedif.		
Course objectives	Students will acquire the and prestressed struct	neoretical and practical k ures.	knowledge and skills as r	ecessary for the analysis	s of reinforced concrete
Learning outcomes:	1.calculate all actions of 2.calculate an in-plane 3.calculate a simple sp 4.check bearing capaci 5.draw bending schedu	on concrete structures. L design model using a co atial model of a structur ity of an element using t ules with the definition of	evel:6 omputer program. Level: e using a computer prog he limit state method. Le f quantities using a comp	6 ram. Level:6 evel:6 outer program. Level:6	
Methods of carrying out lectures	Ex cathedra teaching Case studies Modelling Questions and answers Oral presentation of lec physical condition. Que think and make conclu	s ctures using teaching aic estions are asked during sions in the way they wil	ls as appropriate. Desigr lectures to enhance stud l be expected to do in th	n models are presented a dent participation, and to leir future work.	and used to explain o encourage students to
Methods of carrying out auditory exercises	Laboratory exercises, c Traditional literature ar Data mining and knowl Computer simulations Workshop Students are prepared selected examples, wit	computer simulations nalysis ledge discovery on the W for elaboration of the as h a particular emphasis	/eb signment. Individual por on dimensioning and ber	tions of the assignment and ing schedule drawing.	are presented on
Methods of carrying out laboratory exercises	Laboratory exercises, c Traditional literature ar Data mining and knowl Computer simulations Workshop	computer simulations nalysis ledge discovery on the W	/eb		
Lourse content lectures	1.Actions on structures 2.Prestressed structure Learning outcomes:2 3.Prestressing force, lo 4.Calculation Prestress 5.Transverse force. Spl 6.Details and construct 7.The required cross-se 8.Serviceability limit st 9.Calculation, reinforce 10.Calculation, reinforc 11.Calculation, reinforc 13.Calculation, reinforc 14.Calculation, reinforc 15.Colloquium., 2h, Lei	c., Zh, Learning outcomes es. Basic concepts, mater es. Basic concepts, mater ss of prestressing force., ed the concrete section litting forces., 2h, Learnin tive rules for prestressed ectional geometry. Exter ate. Prestressing in stati ement and construction cement and construction arning outcomes:4,5	SIL rials, historical developm . 2h, Learning outcomes: in bending. Ultimate liming outcomes:4 concrete structures, 2h, nal prestressing., 2h, Lea cally indeterminate syste of reinforced concrete sla of reinforced concrete b of reinforced concrete for of reinforced concrete s of reinforced concrete s of reinforced concrete s of reinforced concrete s of reinforced concrete s	ent, types and systems 2 t state., 2h, Learning out arning outcomes:4 arning outcomes:2 ams., 2h, Learning outcon bs., 2h, Learning outcon leams., 2h, Learning outcon by all bracket., 2h, Learning outcon vall bracket., 2h, Learning outcon learning outcon the state outcon the stat	of prestressing., 2h, tcomes:2 mes:4 nes:4,5 comes:4,5 earning outcomes:4,5 g outcomes:4,5 g outcomes:4,5 g outcomes:4,5
Course content auditory	1.Creating a static moc 2.Dimensioning of slab: 3.Creating a static spat 4.Static, dynamic and s 5.Dimensioning of plat 6.The first colloquium, 7.Creating static mode 8.Placing basic load an 9.Dimensioning of colu 10.Creating a reinforce 11.Creating a reinforce 12.Creating a reinforce 13.Creating a reinforce 14.Creating a reinforce 15.The second colloqui	del of plane slab using a s and beams. Creating re tial models more storey is seismic analysis of the sp es, beams, columns and spatial design model mo l prefabricated concrete d earthquakes., 1h, Lear mns and beams., 1h, Lear ment drawing for the sla ment draft for the walls. ment draft for the walls. ement draft for beam., 1h ement draft for the pillars ement draft for foundatio ium, an independent pro	computer., 1h, Learning eports., 1h, Learning out residential building., 1h, batial model., 1h, Learnin walls. Creating reports., ore storey residential buil halls., 1h, Learning outco ning outcomes:1 arning outcomes:4 ab., 1h, Learning outcomes , 1h, Learning outcomes:5 s., 1h, Learning outcomes ns and stairs., 1h, Learning duction of rebar draft pla	outcomes:1 comes:2 Learning outcomes:3 1g outcomes:3 1h, Learning outcomes:3 Iding., 1h, Learning outco omes:3 es:5 :5 s:5 ing outcomes:5 ate and beams. , 1h, Lea	3 omes:3 rning outcomes:5
Course content laboratory	1.Creating a static mod 2.Dimensioning of slab 3.Creating a static spat 4.Static, dynamic and s 5.Dimensioning of plat 6.The first colloquium,	del of plane slab using a s and beams. Creating re tial models more storey i seismic analysis of the sp es, beams, columns and spatial design model mo	computer., 1h, Learning eports., 1h, Learning out residential building., 1h, patial model., 1h, Learnir walls. Creating reports., rre storey residential buil	outcomes:1 comes:2 Learning outcomes:3 ng outcomes:3 1h, Learning outcomes:3 Iding., 1h, Learning outco	3 omes:3

	 7.Creating static model prefabricated concrete halls., 1h, Learning outcomes:3 8.Placing basic load and earthquakes., 1h, Learning outcomes:1 9.Dimensioning of columns and beams., 1h, Learning outcomes:4 10.Creating a reinforcement drawing for the slab., 1h, Learning outcomes:5 11.Creating a reinforcement draft for the walls., 1h, Learning outcomes:5 12.Creating a reinforcement draft for beam., 1h, Learning outcomes:5 13.Creating a reinforcement draft for the pillars., 1h, Learning outcomes:5 14.Creating a reinforcement draft for foundations and stairs., 1h, Learning outcomes:5 14.Creating a reinforcement draft for foundations and stairs., 1h, Learning outcomes:5 14.Creating a reinforcement draft for foundations and stairs., 1h, Learning outcomes:5
Required materials	Basic: classroom, blackboard, chalk Overhead projector
Exam literature	Osnovna: 1. Gukov, I.: Betonske konstrukcije I. Skripta Tehničkog veleučilišta u Zagrebu. Zagreb. 2010. 2. Sorić, Z., Kišiček, T.: Betonske konstrukcije 1. Sveučilišta u Zagrebu. Građevinski fakultet. Zagreb. 2014. 3. Radić, J. i suradnici: Betonske Konstrukcije Priručnik, Hrvatska sveučilišna naklada, Sveučilište u Zagrebu, Građevinski fakultet, SECON HNDK, Andris, Zagreb, 2006. 4. Radić, J. i suradnici: Betonske Konstrukcije Riješeni primjeri, Hrvatska sveučilišna naklada, Sveučilište u Zagrebu, Građevinski fakultet, Andris, Zagreb, 2006. 5. Behaim, B.: Armirani beton, Ars nova, Zagreb, 2010. Dodatna: 6. HRN EN 1990:2011. Eurokod. Osnove projektiranja konstrukcija + nacionalni dodatak. 7. HRN EN 1991:2012. Eurokod 1. Djelovanja na konstrukcije + nacionalni dodatak. 8. HRN EN 1992:2013. Eurokod 2. Projektiranje betonskih konstrukcija + nacionalni dodatak. 9. HRN EN 1998:2011. Eurokod 8. Projektiranje potresne otpornosti konstrukcija + nacionalni dodatak. 10. Tehnički propis za betonske konstrukcije, 2009.
Students obligations	Uvjet za potpis stjese obranom izrag programa, poloenim kolokvijima te pohaem nastave.
Knowledge evaluation during semester	Redovitost pohaa. Kolokvij, teorijska pitanja. Seminarski rad. Programski zadatak.
Knowledge evaluation after semester	Assignment submittal is a precondition for the second signature. Written examination relating to the theory and problems solved during the exercises. Oral examination (may be taken only by students who solved at least 50 percent of problems during the written part of the examination)
Student activities:	Aktivnost ECTS (Written exam) 2 (Oral exam) 2 (Constantly tested knowledge) 1
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot pass this course unless they have passed Betonske konstrukcije I Students cannot enroll in this course unless they have completed Betonske konstrukcije I Students cannot enroll in this course unless they have passed Građevinski materijali
ISVU equivalents:	22382;

Code WEB/ISVU	23457/155966	ECTS	5.0	Academic year	2018/2019
Name	Conduct of Company	Business Operation	ons		I
Status	5th semester - Manag	ement in Civil En	gineering (Redovni gradi	iteljstvo) - obligatory course	
Teaching mode	Lectures + exercises	(auditory + labor	atory + seminar + meto	dology + construction)	30+30 (12+0+0+18)
	work at home		,	55	90
Teachers	Lectures:mr. Alenka P	oljičak dipl.oec.,	viši predavač		
	Auditory exercises:mr	. Alenka Poljičak	dipl.oec., viši predavač		
	Construction exercise	s:mr. Alenka Polji	ičak dipl.oec., viši predav	/ač	
Course objectives	Provide students with	basic knowledge	about business manage	ment and learn how to maste	the basic skills of
	business process man	agement and bu	siness functions.		
Learning outcomes:	1.Analyze the legal an	id business forms	s of a company. Level:6		
	3 Analyze processes a	and husiness func	tions in a husiness organ	nization Level:6	
	4.Design documents r	elevant to the co	mpany s business. Level	:6	
	5.to reconsider the sp	ecificity of the bu	usiness. Level:6,7		
Methods of carrying	Ex cathedra teaching				
out lectures	Case studies				
	Discussion				
	Questions and answer	S			
Methods of carrying	Group problem solvin				
out auditory	Discussion, brainstorr	9 nina			
exercises	Workshop				
How construction	Discussion, brainstorn	ning			
exercises are held	Workshop				
Course content	1.Establishment of a c	company - legisla	tive framework, 2h, Outo	come 6, 2h, Learning outcome	S:3
lectures	2.Specificity of the ma	ain activity as a p	rerequisite and prerequi	site for business organization,	2h, Learning outcomes:1
	A Organization and m	anagement of the	e company 2h Learning	outcomes:3	211, Learning outcomes.5
	5.Strategy and strategy	av management.	2h. Learning outcomes:	3	
	6.Stakeholders and th	e business enviro	onment, 2h, Learning out	tcomes:2	
	7.Porter, 2h, Learning	outcomes:3			
	8.Business functions of	of the company, 2	2h, Learning outcomes:3		
	9.Organizational mod	els, 2h, Learning	outcomes:2		
	10.Value Chain, 2h, Le	earning outcomes	s:3		
	11.Marketing mix Out	come 5, 2h, Lear	ning outcomes:2		
	12.Business and Finar	nication Outcome	usiness Outcome 4, 2n, L	earning outcomes:3	
	14 Creating a busines	s plan I Outcome	6. 2h. Learning outcome	es.2	
	Creating a business p	lan II Outcoume 6	5. 2h. Learning outcomes	s:3	
	15.Business Digitizatio	on Outcome 5, 2h	n, Learning outcomes:2		
Course content	1.1. Analysis of variou	is legislative fram	neworks for establishing	a legal form of company. 2h, (Jutcome 6, 2h, Learning
auditory	outcomes:1	- Income the Children in			
	2.2. Understanding th	e impact of Main	Activity on Quality Mana	igement. 2n; Outcome 3., 2n,	Learning outcomes:1
	outcomes 1	alegy and under	standing of strategic fila	nagement significance, 21, 00	icome z., zn, ceaning
	4.6. Development Stra	ategies, 2h, Outco	ome 6., 2h, Learning out	comes:1	
	5.10. Balance Sheet a	nd Profit and Los	s Account, 2h, Outcome	6., 2h, Learning outcomes:1	
	6.11. Business corresp	pondence and co	mmunication, 2h, Outcor	me 4., 2h, Learning outcomes:	1
	7.no lectures, 2h				
	8.no lectures, 2n				
	10 no lectures, 2h				
	11.no lectures, 2h				
	12.no lectures, 2h				
	13.no lectures, 2h				
	14.no lectures, 2h				
	15.no lectures, 2h				
Course contout		winetienel ekente	alagoification 2h Evit 2	Oh Leeveine euteeneed	
Course content	1.3. Snowing the orga	nizational charts	classification, 2n, Exit 3.	, 2n, Learning outcomes:1	
constructures	3.7 L colloquium pre	naring and condu	i business, 21, Outcome	odus 2 3 4 5 2b Learning out	comes:1
	4.8. Business Function	ns. 2h. Outcome 4	4., 2h. Learning outcome	s:1	comes.1
	5.9. Value chain - valu	ue chain. 2h. Outo	come 5 2h. Learning ou	tcomes:1	
	6.12. Making a busine	ess plan, 2h. Outc	ome 6., 2h, Learning out	comes:1	
	7.13. Discussion on di	gitalization and b	ousiness improvement., 2	h, Learning outcomes:1	
	8.14. II. colloquium, p	reparation and in	nplementation, 2h, Exodu	us 2,3,4,5, 2h, Learning outco	nes:1
	9.15. Interesting Case	Studies, 2h, Exit	s 6., 2h, Learning outcor	nes:1	
	11 no lectures, 2h, Le	arning outcomes	:1		
	12 no lectures, 211, Le	arning outcomes	.⊥ •1		
	13.no lectures, 2h, Le	arning outcomes	:1		
	14.no lectures, 2h, Le	arning outcomes	:1		

	15.no lectures, 2h, Learning outcomes:1		
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Overhead projector		
Exam literature	 Alenka Poljičak Poslovanje tvrtke skripta sa predavanja, Tehničko veleučilište u Zagrebu 2017. Zakon o trgovačkim društvima Zakon o obrtu, Zakon o ustanovama Sikavica, Pere: Organizacija Školska knjiga Zagreb 2011. Dopunska literatura Appelo, Jurgen: Management 3.0 Leading Agile Develepors, Developing Agile Leader, Addison-Wesles, Boston, MA 2011. Žager, Katarina i dr.: Analiza financijskih izvještaja, RIF, Zagreb 2017. Bovee, C.L., Thill, J.V.: Suvremena poslovna komunikacija, Mate d.o.o. Zagreb, 2012. 		
Students obligations	classes attendance - min 50%		
Knowledge evaluation during semester	2 colloquium		
Knowledge evaluation after semester	writen and oral exam		
Student activities:	Aktivnost ECTS (Activity in class) 1 (Written exam) 3 (Oral exam) 1		
Remark	This course can be used for final thesis theme		
Prerequisites:	Students cannot enroll in this course unless they have completed Tržište i poslovno okruženje Students cannot enroll in this course unless they have passed Proračun konstrukcija Students cannot enroll in this course unless they have passed Matematika II		
ISVU equivalents:	22367;		
Proposal made by	Alenka Poljičak, 01/05/2018.		

Code WEB/ISVU	23919/184646	ECTS	6.0	Academic year	2018/2019			
Name	Construction calculati	on						
Status	2nd semester - Under	graduate professional st	udy in civil engineering (Redovni graditeljstvo) - o	bligatory course			
Teaching mode	Lectures + exercises work at home	(auditory + laboratory +	seminar + metodology -	+ construction)	30+30 (24+0+0+6) 120			
Teachers	Lectures:1. dr.sc. Dalibor Gelo mag.ing.aedif. Lectures:2. mr.sc. Željko Lebo v. pred. Auditory exercises:mr.sc. Jure Galić predavač Auditory exercises:dr.sc. Dalibor Gelo mag.ing.aedif. Auditory exercises:mr.sc. Željko Lebo v. pred. Construction exercises:mr.sc. Jure Galić predavač Construction exercises:dr.sc. Dalibor Gelo mag.ing.aedif. Construction exercises:mr.sc. Željko Lebo v. pred.							
Course objectives	Acquiring basic theoretical and practical notions on structural design, aimed at ensuring better understanding of design documents and solving simple structural problems when encountered in the construction process.							
Learning outcomes:	1.test static systems, particularly with regard to their geometric invariability. Level:6 2.differentiate geometrically invariable statically determinate and statically indeterminate beam systems. Level:6 3.calculate internal forces of statically determinate and statically indeterminate planar beam systems. Level:6 4.draw diagrams of internal forces for statically determinate and statically indeterminate planar beam systems. Level:6 5.calculate displacements and angles of turn for planar beam static systems. Level:6							
Methods of carrying out lectures	Ex cathedra teaching Case studies Demonstration Simulations Modelling Discussion Basic theoretical and and displacement are explanations are prov	practical notions about s studied by means of str ided in lecture notes rec	tructural design are expl uctural models. Similar p ently prepared for this co	ained.The state of equilit ractical examples are exp purse.	prium, internal forces, plained.Additional			
Methods of carrying out auditory exercises	Group problem solvin	g						
How construction exercises are held	Group problem solvin	g						
Course content lectures	 I.Introduction. Assumptions beam static. static systems, 2h, Learning outcomes:1,2 2.Connections, geometric stability and statical determined systems. Classifications, 2h, Learning outcomes:1,2 3.Statical determined systems, simple systems, 2h, Learning outcomes:1,2,3,4,5 4.Gerbers beams, 2h, Learning outcomes:1,2,3,4,5 5.Statical determined systems, truss systems, 2h, Learning outcomes:1,2,3,4,5 6.Three hinged frame and arc, 2h, Learning outcomes:1,2,3,4,5 7.First colloquium, 2h, Learning outcomes:1,2,3,4,5 8.Three hinged frame and arc with tie rod, 2h, Learning outcomes:1,2,3,4,5 9.Strengthened beams (Langer beam) - analytical and semigraphical, 2h, Learning outcomes:1,2,3,4,5 10.Point displacement of bar systems, 2h, Learning outcomes:1,2,3,4,5 12.Force method - general, 2h, Learning outcomes:1,2,3,4,5 13.Force method - application, 2h, Learning outcomes:1,2,3,4,5 14.Displacement method, 2h, Learning outcomes:1,2,3,4,5 15.Third colloquium, 2h, Learning outcomes:1,2,3,4,5 							
Course content auditory	1.no classes, 2h 2.Introductions conne constructions., 2h, Le 3.Beam, console and 4.Gerbers beams - an 5.Truss structure - an. 6.no classes 7.Three-hinged arch a 8.Three-hinged arch a outcomes:1,2,3,4 9.Strengthened beam 10.no classes 11.Deformation calcu 12.Force method - on 13.Force method - on 14.no classes 15.Force method - twi	ctions, geometric uncha arning outcomes:1 beam with console differ alytical and semigraphic alytical, Ritter and Cullm and frames - analytical ar and frames with tie rod, a s (Langer beam) - analyt lation., 2h, Learning outco ce static undefined syste ice static undefined syste ice static undefined syste	ngeable systems, static of ential relationship, 2h, Le al method, 2h, Learning an calculation methods, nd graphical, 2h, Learnin analytical, graphical dete cical and semigraphical, 2 comes: 1,2,3,4,5 cm, 2h, Learning outcome em, 2h, Learning outcome	defined constructions and earning outcomes:1,2,3 outcomes:1,2,3 2h, Learning outcomes:1, g outcomes:1,2,3 rmination of forces in the 2h es:1,2,3,4,5 es:1,2,3,4,5 es:1,2,3,4,5	static undefined ,2,3 section, 2h, Learning			
Course content constructures	1.no classes, 2h 2.no classes, 2h 3.no classes, 2h 4.no classes, 2h 5.no classes, 2h 6.Geometric stability, 7.no classes, 2h 8.no classes, 2h	Gerbers beams, truss sy	rstems, 2h, Learning outc	:omes:1,2,3,4,5				

	9.no classes, 2h 10.Three hinged frame and arc, three hinged frame and arc with tie rod, Langer beams, 2h, Learning outcomes:1,2,3, 11.no classes, 2h 12.no classes, 2h 13.no classes, 2h 14.Point displacement of bar systems, Force method, 2h, Learning outcomes:1,2,3,4,5 15.no classes, 2h					
Required materials	Basic: classroom, blackboard, chalk Overhead projector					
Exam literature	Basic literature: 1. Ž. Lebo: Separati s predavanja 2. Rak, Gelo: Proračun konstrukcija 2. Lj. Kopričanec-Matijevac: Zbirka zadataka iz proračuna konstrukcija, TVZ, Zagreb 2011. 3. M. Anđelić: Građevna statika II, Zagreb 2005. 4. V. Simović: Građevna statika I., Građevinski institut, Zagreb, 1988. Additional literature: 1. V. Šimić: Otpornost materijala I, Školska knjiga, Zagreb, 1992. 2. V. Šimić :Otpornost materijala II, Školska knjiga, Zagreb, 1995. 3. M. Anđelić: Statika neodređenih štapnih konstrukcija, DHGK, Zagreb, 1993. 4. Riješeni primjeri kolokvija i ispitnih zadataka na mrežnim stranicama predmeta					
Students obligations	Class attendance. Minimum of 75 points in three exams. Minimum of 25 points per exam.					
Knowledge evaluation during semester	Class attendance. Exams: numerical examples, theoretical questions					
Knowledge evaluation after semester	Written examination. Verbal examination.					
Student activities:	AktivnostECTS(Classes attendance)2(Constantly tested knowledge)2(Written exam)1(Oral exam)1					
Remark	This course can not be used for final thesis theme					
Prerequisites:	Students cannot enroll in this course unless they have completed Tehnička mehanika Students cannot pass this course unless they have passed Tehnička mehanika					
ISVU equivalents:	22334;155968;					
Proposal made by	mr.sc. Željko Lebo v. pred. dr.sc., Dalibor Gelo mag.ing.aedif. 3.4.2017.					

Code WEB/ISVU	22882/22358	ECTS	4.0	Academic year	2018/2019				
Name	Construction Machinery	/							
Status	4th semester - Undergr	aduate professional stu	udy in civil engineering (R	edovni graditeljstvo) - o	bligatory course				
Teaching mode	Lectures + exercises (a work at home	uditory + laboratory +	seminar + metodology +	- construction)	30+15 (15+0+0+0) 75				
Teachers	Lectures:2. mr.sc. Petar Adamović dipl.ing.građ. Lectures:2. mr.sc. Petar Adamović prof.v.škole Auditory exercises: Domagoj Šojat struč.spec.ing.aedif.								
	Auditory exercises:v.pr Auditory exercises: Sar	edavač Boris Uremović iela Vojnović mag.ing.a	dipl.ing.građ. edif						
Course objectives	The aim of the course is to teach students about the possibilities and operation of construction machines, and about the way in which they are included in complex technological processes during realization of civil engineering and building projects.								
Learning outcomes:	1.make distinction betw Level:6	1.make distinction between standard construction machines and other required construction machinery and equipment.							
	2.analyse the technique, technology, logistics and organisation of technological processes used in earth, concrete and asphalt works. Level:6								
	3.specify types of construction machines, transport devices and other technological equipment for realization of works. Level:6								
	4.form groups of construction machines and transport vehicles for the realization of construction works. Level:6,7 5.establish flow diagrams and technology-based maps for utilisation of construction machinery in construction works. Level:6								
	6.calculate performance of standard construction machines and transport devices (performance of vehicles and cranes). Level:6								
	works. Level:6,7	7.anticipate types of logistic, technical and technological resources that are needed for realization of construction works. Level:6,7							
	8.develop possible alternatives for organizing technological and logistical processes relating to earthworks, concrete works and asphalt works. Level:6,7								
	construction machinery 10.define an optimum	. Level:6,7 construction machinery	with regard to organisat	ion of technological and	logistical processes				
	during construction wo	rk. Level:6,7		-					
Methods of carrying out lectures	Ex cathedra teaching Discussion Questions and answers								
	Other In the course of lecture presented through pho teaching aids, video pro	s, the operation of cons tographs or films, inclu- ojectors, and computer	struction machines during ding video recordings froi s.	g realization of various te m real on-site situations,	echnological processes is , using at that various				
Methods of carrying out auditory exercises	Group problem solving Problems relating to se group of machines, are	lection of an appropriat solved on the blackboa	e technology, performan ard. Video tapes showing	ce calculation, and harm real life technological pr	nonization of work in a rocesses are presented.				
Course content lectures	1. Construction techniq machinery, properties of 2. Construction techniq machinery, properties of Transport vehicles and carrying tower cranes a 3. Transport vehicles an carrying tower cranes a 4. Machines and techno excavation in soil and r trench excavators), 2h, 5. Machines and techno excavation in soil and r trench excavators), 1h, Machines and equipme Learning outcomes:3,4 6. Machines and equipme Learning outcomes:3,4 7. Selection of machine: machines and equipme 8. Selection of machine: machines and equipme Machines and technolo equipment, production Learning outcomes:3,4 9. Machines and technolo equipment, production Learning outcomes:3,4 10. Equipment for realiz outcomes:3,4,7,8,9,10 Asphalt works, asphalt rehabilitation of asphal	Je and technology (con of modern construction Je and technology (con of modern construction devices used in constru- and other cranes, constru- devices used in constru- and other cranes, const logical equipment for e ock, bulldozers, scrape Learning outcomes:3,4 logical equipment for e ock, bulldozers, scrape Learning outcomes:3,4 nt for rock mining, mot 7,9,10 nent for rock mining, mot for demolition of bui gical equipment for con of fresh concrete, conce 7,8,9,10 logical equipment for con of fresh concrete, conce 7,8,9,10 tation of surface concree concrete placing equip t pavements, 1h, Learn	struction works, construct machinery), 2h, Learning struction works, construct machinery), 1h, Learning uction industry (transport ruction site lifts and eleva truction site lifts and eleva arthworks and geotechnic rs, rock ripping machines 4,7,9,10 arthworks and geotechnic rs, rock ripping machines 4,7,9,10 bile crushing plants, mach obile crushing plants, mach obile crushing plants, mach constructions and equipme ldings, 2h, Learning outco s, machines and equipme ldings, 1h, Learning outco screte and asphalt works: rete plant, equipment for oncrete and asphalt works rete plant, equipment for te and plasters, selection ment, equipment for reali ing outcomes:3,4,7,9,10	tion technique and techn g outcomes:1,2,3,5 tion technique and techn g outcomes:1,2,3,5 d during construction, loa ators), 1h, Learning outcort out during construction, loa ators), 2h, Learning outcort cal works in soil and rock t, excavators, excavator cal works in soil and rock t, excavators, excavator cal works in soil and rock t, excavators, excavator nines for placement of lo chines for placement of ent for geotechnical and omes:3,4,7,9,10 f (concrete works, transp transport and placing o the transport and placing o the tor machines for concret of machines for concret atiation of asphalt macad	nology, construction nology, construction ders and vehicles omes:1,2,3 oaders and vehicles omes:1,2,3 k: (earthworks, surface implements and tools, k: (earthworks, surface implements and tools, ose materials, 1h, loose materials, 2h, underground works, underground works, f fresh concrete, f fresh concrete, f fresh concrete), 1h, sported concrete, f fresh concrete), 2h, te works, 2h, Learning te works, 1h, Learning lam roads, equipment for				
	 12.Asphalt works, asphalt concrete placing equipment, equipment for realization of asphalt macadam roads, equipment for rehabilitation of asphalt pavements, 2h, Learning outcomes:3,4,7,9,10 13.Performance of standard construction machines and transport vehicles, 2h, Learning outcomes:6 14.Performance of standard construction machines and transport vehicles, 1h, Learning outcomes:6 Selection of machines and planning of machine work in construction, 2h, Learning outcomes:4,7,8,9,10 15.Selection of machines and planning of machine work in construction, 2h, Learning outcomes:4,7,8,9,10 								
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Course content auditory	1.Solving problems relating to: technological system determination, performance of construction machines, harmonization of work in a group for a given technological system, and for various types of work., 1h, Learning								
	outcomes:4,5,6,8 2.Solving problems relating to: technological system determination, performance of construction machines, harmonization of work in a group for a given technological system, and for various types of work., 1h, Learning outcomes:4,5,6,8								
	3.Solving problems relating to: technological system determination, performance of construction machines, harmonization of work in a group for a given technological system, and for various types of work., 1h, Learning outcomes:4,5,6,8								
	4.Solving problems relating to: technological system determination, performance of construction machines, harmonization of work in a group for a given technological system, and for various types of work., 1h, Learning outcomes:4,5,6,8								
	5.Solving problems relating to: technological system determination, performance of construction machines, harmonization of work in a group for a given technological system, and for various types of work., 1h, Learning outcomes:4,5,6,8								
	6.Solving problems relating to: technological system determination, performance of construction machines, harmonization of work in a group for a given technological system, and for various types of work., 1h, Learning outcomes:4,5,6,8								
	7.Solving problems relating to: technological system determination, performance of construction machines, harmonization of work in a group for a given technological system, and for various types of work., 1h, Learning outcomes:4,5,6,8								
	8.Solving problems relating to: technological system determination, performance of construction machines, harmonization of work in a group for a given technological system, and for various types of work., 1h, Learning outcomes:4,5,6,8								
	9.50Wing problems relating to: technological system determination, performance of construction machines, harmonization of work in a group for a given technological system, and for various types of work., 1h, Learning outcomes:4,5,6,8								
	harmonization of work in a group for a given technological system determination, performance of construction machines, barmonization of work in a group for a given technological system, and for various types of work., 1h, Learning outcomes:4,5,6,8								
	harmonization of work in a group for a given technological system determination, performance of construction machines, outcomes:4,5,6,8 12 Solving problems relating to: technological system determination, performance of construction machines								
	harmonization of work in a group for a given technological system determination, performance of construction machines, outcomes:4,5,6,8 13 Solving problems relating to: technological system determination, performance of construction machines								
	harmonization of work in a group for a given technological system determination, performance of construction mechanics, outcomes:4,5,6,8 14.Solving problems relating to: technological system determination, performance of construction machines.								
	harmonization of work in a group for a given technological system, and for various types of work., 1h, Learning outcomes:4,5,6,8 15.Solving problems relating to: technological system determination, performance of construction machines.								
	harmonization of work in a group for a given technological system, and for various types of work., 1h, Learning outcomes:4,5,6,8								
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Overhead projector Video equipment								
Exam literature	Obvezna 1. Z. Linarić : Leksikon strojeva i opreme za proizvodnju građevinskih materijala, Učinci građevinskih strojeva i vozila pri zemljanim radovima, biblioteka Mineral, Business Media Croatia d.o.o., Zagreb, 2007. 2. P.Đukan i suradnici: Strojevi u građevinarstvu, Građevinar, Zagreb, 1991 3. E.Slunjski: Strojevi u građevinarstvu, Sveučilište u Zagrebu, 1995.								
	Additional literature: 1. Z. Linarić : Postrojenja za proizvodnju sipkih i povezanih mineralnih gradiva, drobilane, tvornice betona, asfaltne baze, biblioteka Mineral, Business Media Croatia d.o.o., Zagreb, 2009 2. R. Lončarić: Organizacija graditeljskih projekata , Sveučilište u Zagrebu, Zagreb, 1995, 3. Freddy L. Roberts i dr.: Vruće asfaltne mješavine, HSGI, 2003.								
Students obligations Knowledge	maximum of 3 absences from exercises Redovitost pohaa#5#0#60\$Kolokvij, numeri zadaci#1#34#60\$Kolokvij, teorijska pitanja#2#66#60\$								
evaluation during semester									
Knowledge evaluation after semester	Written examination for testing theoretical knowledge (lectures) and knowledge gained during exercises (solving problems based on auditory exercises). Oral examination (may be taken by students that passed the written part of the examination)								
Student activities:	AktivnostECTS(Written exam)2(Classes attendance)2								



Remark	This course can not be used for final thesis theme
Prerequisites:	No prerequisites.
Proposal made by	v.predavač Boris Uremović dipl.ing.građ., 17.9.2018

Study programme	for academic	year 2018/2019
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Code WEB/ISVU	23453/155962	ECTS	5.0	Academic year	2018/2019	
Name	Construction Managem	ent l				
Status	5th semester - Building and traffic infrastructur (Redovni graditeljstvo) obligatory course) Construction (Redovni g re) (Redovni graditeljstvo - obligatory course5th s	graditeljstvo) - obligatory b) - obligatory course5th emester - Civil and Envir	/ course5th semester - C semester - Management onmental Engineering (F	ivil Engineering (Water t in Civil Engineering Redovni graditeljstvo) -	
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + s	seminar + metodology +	· construction)	30+30 (10+0+0+20) 90	
Teachers	Lectures:1. mr.sc. Petar Adamović prof.v.škole Lectures:v.predavač Boris Uremović dipl.ing.građ. Auditory exercises: Nina Šantek struč.spec.ing.aedif., predavač Auditory exercises: Domagoj Šojat struč.spec.ing.aedif. Auditory exercises: Sanela Vojnović mag.ing.aedif Construction exercises: Nina Šantek struč.spec.ing.aedif., predavač Construction exercises: Domagoj Šojat struč.spec.ing.aedif.					
Course objectives	Students will acquire th on various civil enginee	neoretical, practical and ering and building projec	operative knowledge and ts.	d skills for the managem	ent of construction work	
Learning outcomes:	1.analyse the project in 2.anticipate work meth 3.create work processe 4.calculate resources n 5.plan construction tim personnel and machine 6.draw the site organis	nplementation design. L ods and construction tec s documented with tech leeded (material, labour, e by creating the critical ery. Level:6,7 ation chart with the calc	evel:6 chnology. Level:6,7 nology maps and flow di machinery). Level:6 path diagram and bar c ulation of storage areas.	agrams. Level:6,7 harts showing requireme Level:6	ents in terms of	
Methods of carrying out lectures	Ex cathedra teaching Case studies Discussion Questions and answers Other Appropriate teaching a methods as used in rea needed to explain topic	ids (video projector and al-life situations, work pla cs covered in the course.	computer) will be used t anning methods, includir	o present construction p g graphical plans and vi	rocesses, construction deo recordings as	
Methods of carrying out auditory exercises	Group problem solving Discussion, brainstormi Other Units necessary for pre engineering) are presel	ing paration of the assignment nted in a logical order.	ent (construction manag	ement project in civil en	gineering and building	
How construction exercises are held	Group problem solving Discussion, brainstormi Other Students independently in civil epgineering and	ing y solve problems as need	ded for preparation of th	e assignment (construct	ion management project	
Course content lectures	1. Introduction to constr 2. Work processes and 3. Organization and clas 4. Preparation and orga 5. Production downtime 6. Construction manage 7. Work method selectio 8. Site organisation, 2h, 9. Purpose and objective 10. Classification of plar 11. Classification of plar 12. Selecting plan type 13. Selecting plan type 14. Plan elaboration pro 15. Plan elaboration pro	vuction management; de their properties (classifi sification of construction anization of production ir is and related losses, 2h, ement project (purpose a on and design of technol , Learning outcomes:4,6 e of planning in construc- ns, 2h, Learning outcome and plan elaboration me and plan elaboration me ocedure (activities, relation cocedure (activities, relation	finitions and basic terms cation, presentation), 2h n processes , 2h, Learnin n construction industry , Learning outcomes:1,5 nd components), 2h, Lea ogical processes, 2h, Lea tion industry, 2h, Learni es:4,5 es:4,5 thodology, 2h, Learning thodology, 2h, Learning onships, time calculation onships, time calculation	;, 2h, Learning outcomes; , Learning outcomes:1,2 ig outcomes:3 2h, Learning outcomes:1,2,5 arning outcomes:1,2,5 arning outcomes:2,3,4 ng outcomes:5 outcomes:4,5 outcomes:4,5 n, representation), 2h, Le n, representation), 2h, Le	arning outcomes:4,5 arning outcomes:4,5	
Course content auditory	1.Bill of quantities, 2h, 2.no classes 3.no classes 4.no classes 5.Summary of material 6.no classes 7.no classes 9.Selection of machine: of work groups, 2h, Le 10.Selection of machine: composition of work gru 11.no classe 12.no classes 13.Analyzing structure 14.no classes 15.no classes	Learning outcomes:1,4 s , 2h, Learning outcome s and equipment, machi arning outcomes:4 es and equipment, mach oups , 1h, Learning outco of time schedules , 2h, L	es:1,4 ne performance selection nine performance selection omes:4 Learning outcomes:5	n, harmonization of work on, harmonization of woi	: in a group, composition rk in a group,	

Course content	1 no classes
constructures	2.Each student prepares the program assignment entitled: Construction management project in civil engineering and
	3.Each student prepares the program assignment entitled: Construction management project in civil engineering and
	building engineering, 2h, Learning outcomes:1,4 A Each student propages the program assignment entitled: Construction management project in civil engineering and
	building engineering, 2h, Learning outcomes:1,4
	5.no classes
	6.Each student prepares the program assignment entitled: Construction management project in civil engineering and building engineering. 2b. Learning outcomes: 1.4
	7.Each student prepares the program assignment entitled: Construction management project in civil engineering and
	building engineering, 2h, Learning outcomes:1,4 8 Each student prepares the program assignment entitled: Construction management project in civil engineering and
	building engineering, 2h, Learning outcomes:1,4 9.no classes
	10.Each student prepares the program assignment entitled: Construction management project in civil engineering and
	building engineering, 1h, Learning outcomes:4 11 Each student prepares the program assignment entitled: Construction management project in civil engineering and
	building engineering, 2h, Learning outcomes:4
	12.Each student prepares the program assignment entitled: Construction management project in civil engineering and building engineering, 2h, Learning outcomes:4
	14.Each student prepares the program assignment entitled: Construction management project in civil engineering and
	building engineering, 2h, Learning outcomes:5
	15.Each student prepares the program assignment entitled: Construction management project in civil engineering and building engineering, 2h, Learning outcomes:5
Required materials	Basic: classroom, blackboard, chalk
	Whiteboard with markers
	Video equipment
Exam literature	Basic literature:
	1. J.Izetbegović,V.Žerjav:Organizacija građevinske proizvodnje,Sveučilišni udžbenik Zagreb,2009
	2. G.Bučar: Normativi i cijene u graditeljstvu, Sveučilište u Rijeci, Rijeka, 2003. 2. Milotarij Oznavni konstruija na praditalja Unatalja Gravičilička prelokala Zaprak 2000.
	 M.Katavić:Osnove ekonomije za graditelje; Hrvatska Sveučilišna naklada, Zagreb 2009.
	Additional literature:
	1. J. Klepac: Organizacija građenja, Sveučilište u Zagrebu, Građevinski fakultet, 1984.
	2. J. Maruśić: Organizacija građenja, Sveučilište u Zagrebu, 1994.
Students obligations	maximum of 3 absences from exercises Redevitest pabaa#5#0#60#Kelekvii, pumori zadasi#1#20#60#Kelekvii, teoriiska pitapia#1#20#60#Programski
evaluation during semester	zadatak#1#10#100\$Usmena provjera znanja#1#50#50\$
Knowledge	Assignment "Construction management project in civil engineering and building engineering" - explanation of the
evaluation after	program. Written examination with questions from theory (lectures) and exercises (problem solving based on the construction
semester	management program).
Student activities:	Aktivnost ECTS
	(Project) 2 (Written exam) 1
	(Oral exam) 2
Remark	This course can not be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have passed Proračun konstrukcija
	students cannot enroll in this course unless they have passed Matematika II Students cannot pass this course unless they have passed Građevinski strolevi
	Students cannot enroll in this course unless they have completed Građevinski strojevi
ISVU equivalents:	22360;
Proposal made by	mr.sc. Petar Adamovic, 17.9.2018

Study programme	for academic ye	ar 2018/2019
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Code WEB/ISVU	23454/155963	ECTS	5.0	Academic year	2018/2019	
Name	Construction Managen	nent II				
Status	6th semester - Building Construction (Redovni graditeljstvo) - obligatory course6th semester - Civil Engineering (Water and traffic infrastructure) (Redovni graditeljstvo) - obligatory course6th semester - Management in Civil Engineering (Redovni graditeljstvo) - obligatory course6th semester - Civil and Environmental Engineering (Redovni graditeljstvo) - obligatory course					
Teaching mode	Lectures + exercises (work at home	auditory + laboratory + s	seminar + metodology +	- construction)	30+30 (10+0+0+20) 90	
Teachers	Lectures: 1. mr.sc. Petar Adamović prof.v.škole Lectures: Nina Šantek struč.spec.ing.aedif., predavač Auditory exercises: Nina Šantek struč.spec.ing.aedif., Auditory exercises: Domagoj Šojat struč.spec.ing.aedif. Auditory exercises: Sanela Vojnović mag.ing.aedif Construction exercises: Nina Šantek struč.spec.ing.aedif., Construction exercises: Domagoj Šojat struč.spec.ing.aedif. Construction exercises: Sanela Vojnović mag.ing.aedif.					
Course objectives	Students will acquire t on various civil engine	heoretical, practical and ering and building projec	operative knowledge and ts.	d skills for the managem	ent of construction work	
Learning outcomes:	1.calculate construction 2.prepare public procu- 3.establish a work pro- 4.manage construction 5.prepare work payme 6.schedule handover of 7.organise participants	on costs for a building/stru rement documents. Leve curement procedure. Leve n site documentation. Leve ent proposal. Level:6,7 of works and final accounts and procedures in all ph	ucture. Level:6 il:6,7 el:6,7 vel:6,7 t. Level:6,7 hases of construction wo	rk. Level:6,7		
Methods of carrying out lectures	Ex cathedra teaching Case studies Discussion Questions and answer: Other	S				
Methods of carrying out auditory exercises	Group problem solving Discussion, brainstorm Other) ing				
How construction exercises are held	Group problem solving Discussion, brainstorm Other) ning				
Course content lectures	1.Introduction to the c 2.Business principles, 3.Business principles, 4.Cost planning and cc 5. Notion of cost estim 6. Calculation of direct 7. Calculation of direct 8.Calculation of indirect 9.Legal standards, lega outcomes:3,7 10.Construction law, 2 11.Technical documen 12.Administrative perr 13. Law on public proc 14.Construction site du 15.Payment of work, 2	ost theory; notion of cost rationalization, productiv rationalization, productiv ontrolling, 2h, Learning on lation; types, structures at costs; price analysis, 2h ccosts; price analysis, 2h ct costs, factor calculation al subjects, legal relation th, Learning outcomes:3,4 ltation, 2h, Learning outco mits (location permit, buil curement of work, 2h, Lear ocumentation, 2h, Learning outcomes:5,	t, type and location of co ity, economic considerat ity, economic considerat utcomes:1,2 and methods of cost estin , Learning outcomes:1,2 , Learning outcomes:1,2 n , 2h, Learning outcome ships, types of obligation 4,7 omes:4 ding permit, and operati irning outcomes:3,5 ing outcomes:4 6	st , 2h, Learning outcom ions, profitability , 2h, Le ions, profitability , 2h, Le mation, 2h, Learning out es:1,2 ns and their legal effects, ing permit) , 2h, Learning	es:1 earning outcomes:1 earning outcomes:1 comes:1,2 , 2h, Learning g outcomes:6,7	
Course content auditory	1.List of activities with 2.no classes 3.Critical path diagram 4.no classes 5.no classes 6.Gantt chart, bar chai 7.no classes 8.Labour lodging requi 9.no classes 10.Construction site la 11.no classes 12.Price analysis, cost 13.no classes 14.no classes 5.no classes	time calculation for each n with time analysis (PDM rt, 2h, Learning outcomes irement calculation, stora nyout , 2h, Learning outco estimate, 2h, Learning o	n activity, 1h, Learning o method), 2h, Learning o s:4 nge space calculation, 1h mes:4 utcomes:1,2	utcomes:6 putcomes:6 n, Learning outcomes:4		
Course content constructures	1.Each student prepar building engineering, 2 2.Each student prepar building engineering, 2	es the program assignme 1h, Learning outcomes:6 es the program assignme 2h, Learning outcomes:6	ent entitled: Constructior ent entitled: Constructior	n management project in n management project in	civil engineering and civil engineering and	

	3.no classes, Learning outcomes:6		
	4.Each student prepares the program assignment entitled: Construction management project in civil engineering and building engineering. 2b. Learning outcomes:6		
	5.Each student prepares the program assignment entitled: Construction management project in civil engineering and		
	building engineering, 2h, Learning outcomes:6		
	6.no classes 7 Each student propares the program assignment entitled: Construction management project in sivil opgineering and		
	building engineering, 2h, Learning outcomes:4		
	8.Each student prepares the program assignment entitled: Construction management project in civil engineering and building engineering. 1h Learning outcomes:4		
	9.Each student prepares the program assignment entitled: Construction management project in civil engineering and		
	building engineering, 2h, Learning outcomes:4		
	11.Each student prepares the program assignment entitled: Construction management project in civil engineering and		
	building engineering, 2h, Learning outcomes:4		
	12.00 Classes		
	building engineering, 2h, Learning outcomes:1,2		
	14.Each student prepares the program assignment entitled: Construction management project in civil engineering and		
	building engineering, 2h, Learning outcomes:1,2 15 Each student prepares the program assignment entitled: Construction management project in civil engineering and		
	building engineering, 2h, Learning outcomes:1,2		
Required materials	Basic: classroom, blackboard, chalk		
	Overhead projector		
	Video equipment		
Exam literature	Basic literature: 1. Lizethegović V Žeriav: Organizacija građevinske proizvodnje Sveučilični udžbenik. Zagreb, 2000.		
	2. Uremović B.; Dunović Č:Planiranje projekata uz pomoć programskog alata Microsoft Project 2012		
	Additional literature:		
	1. R. Lončarić: Organizacija izvedbe graditeljskih projekata, Hrvatsko Društvo Građevinskih		
	Inženjera, Zagreb 1995.		
Students obligations	2. G. Bucar: Normativi i cijene u graditeljstvu, sveuciliste u Rijeci, Rijeka, 2003.		
Knowledge	Redovitost pohaa#5#0#60\$Kolokvii, numeri zadaci#1#20#60\$Kolokvii, teoriiska pitania#1#20#60\$Programski		
evaluation during	zadatak#1#10#100\$Usmena provjera znanja#1#50#50\$		
semester			
Knowledge	Written exam		
semester			
Student activities:	Aktivnost ECTS		
	(Project) 2		
	(Written exam) 1 (Oral exam) 2		
Remark	This course can be used for final thesis theme		
Prereguisites:	Students cannot enroll in this course unless they have completed Tehnologija građenja		
	Students cannot enroll in this course unless they have completed Organizacija građenja I		
	Students cannot pass this course unless they have passed Organizacija građenja l		
ISVU equivalents:	22361:		
Proposal made by	mr.sc. Petar Adamović, prof.v.škole, 17.9.2018		

Code WEB/ISVU	23915/184642	ECTS	5.0	Academic year	2018/2019	
Name	Construction Materials					
Status	1st semester - Undergra	aduate professional stud	y in civil engineering (Re	edovni graditeljstvo) - ob	ligatory course	
Teaching mode	Lectures + exercises (a	uditory + laboratory + s	eminar + metodology +	construction)	30+30 (18+12+0+0)	
	work at home				90	
Teachers	Lectures: Tomislav Sva	Lectures: Tomislav Svaguša				
	Lectures:mr.sc. Donka	wurth v. predavac				
	Auditory exercises:mr.s	sc. Donka Wurth v. preda	vač			
	Laboratory exercises:mr.sc. Jure Galić predavač					
	Laboratory exercises:m	r.sc. Donka Wurth v. pre	davač			
Course objectives	Introducing students to	the types and propertie	s of materials and to the	ir use in civil engineering	g	
Learning outcomes:	1.calculate composition	of concrete of a given s	trength, durability and w	vorkability for a particula	ar structural element.	
	Level:b					
	2.uraw yrain size uistribution curve ior an aygregate. Level:o 3 test individual properties of aggregate, cement, fresh and hardened concrete. Level:6					
	4.analyse concrete test	ing results. Level:6				
	5.differentiate types of	aggregate, cement, con	crete admixtures, specia	al types of concrete, bricl	k products, glass and	
	plastics. Level:6				La burde e de carde e l	
	b.differentiate good and	d bad properties of wood strength and constant a	as a construction mate	rial (mechanical, physica	il, physicochemical	
	7.calculate displacement	nts due to change in moi	sture and temperature of	on wood and steel eleme	ents. Level:6	
	8.plan testing of individ	lual properties of steel, v	ood and brick products.	. Level:6,7		
Methods of carrying	Ex cathedra teaching					
out lectures	Lase studies	asic information about m	atorials from the struct	ture and interaction of in	dividual componente to	
	the mechanical therma	a acoustical and other n	roperties relevant to the	use of these materials	in civil engineering	
Methods of carrying	Group problem solving				<u> </u>	
out auditory	Discussion, brainstormi	ng				
exercises	Other					
	Students solve problem	is related to topics cover	ed during the lectures. S	Students are prepared fo	r laboratory sessions	
Mothoda of comulas	and for the preparation	of programs.				
out laboratory	Group problem solving	r laboratory equipment				
exercises	Discussion, brainstormi	ng				
	Using the obligatory lite	erature, Students perforr	n tests in accordance wi	th applicable Croatian st	andards and prepare	
	obligatory assignments	related to the following	topics: physical parame	ters, cement, aggregate,	, fresh concrete,	
	strength and deformation	on of concrete, and non-	destructive testing. The	data acquired during lab	oratory sessions are	
Course content	1 Information about ma	terials Statistical proces	sing Structure and corr	relation of substances 2	h Learning outcomes:1	
lectures	2.Aggregate., 2h, Learn	ing outcomes:2,6	sing. Structure and con	elation of substances., z	in, Learning outcomes.1	
	3.Binders. Cement. Add	litions, admixtures. Wate	r., 2h, Learning outcom	es:3,6		
	4.Fresh concrete. Composition of concrete of specified workability and strength. , 2h, Learning outcomes:6					
	5.Strength of concrete.	Deformation of concrete	e., 2h, Learning outcome	:S: /		
	7.Wood (chemical, phys	sical, mechanical propert	ies). 2h. Learning outco	mes:8		
	8.Wood (durability, faire	e resistance, mildew and	insects) , 2h, Learning	outcomes:8		
	9.Construction steels. M	lethods of production. Th	ne properties of the stee	l. Types of construction	steel, 2h, Learning	
	outcomes:8	autoomoo.6				
	11 Special types of con	crete and special concre	te technologies. 2h. Lea	rning outcomes 6		
	12.Quality control, qual	ity assurance and quality	/ management. Subsequ	uent examination of the	quality of concrete in	
	construction, 2h, Learni	ing outcomes:6				
	13.Mortars. Floors., 2h,	Learning outcomes:5	ale 16 Lasersina subs			
	Testing of bricks and cla	av blocks 1h Learning c	utcomes:5	mes:5		
	15.Tile, production and	testing, 1h, Learning ou	tcomes:5			
	Glass, plastic., 1h, Lear	ning outcomes:5				
-						
Course content	1.No classes, 2h	Physical parameters M	ochanical proportios and	d pormospility 2h Losr	ning outcomocul	
auditory	3.Aggregate (aggregate	e grading, calculation of	cumulative grading, infl	uence of moisture and al	osorption of aggregate.	
	determination of aggree	gate shape), 2h, Learnin	g outcomes:2		soorprion or aggregate,	
	4.Laboratory exercises,	2h				
	5.Laboratory exercises,	2h			a la bla a la Charadan bla a	
	b.Cement (significance,	, cement grade, calculati pent paste temperature	on of mineralogical com cement grade determin	ation) 2h Learning out	Jiation of hydration	
	7.Fresh concrete (desig	ning concrete mixes of s	pecified workability and	concrete grade, influen	ce of temperature of	
	individual components	on the temperature of th	e fresh concrete mix).,	2h, Learning outcomes:4		
	8.Laboratory exercises,	2h				
	9.Laboratory exercises,	20 Nation of concrete Speci	al tests (coloromotor uli	trasound pull-off concre	ate moisture	
	penetrability. reinforcin	g steel), 2h, Learning ou	tcomes:5	asouna, puil-off, concre	.ce moiscule,	
	11.Laboratory exercises	s, 2h				
	12.Laboratory exercises	s, 2h				
l	13.Concrete compositio	on design., 2h, Learning (outcomes:6			

	14.Laboratory exercises, 2h 15.Laboratory exercises, 2h
Course content laboratory	 1.No classes, 2h 2.Auditory exercises, 2h 3.Auditory exercises, 2h 4.Determination of physical properties of materials (density, bulk density, absorption, surface moisture, moisture, water absorption, porosity)., 2h, Learning outcomes:1 5.Properties of aggregates (quartering, grading, aggregate grain shape testing, determination of silty and clayey particles in aggregate, grain shape determination)., 2h, Learning outcomes:2 6.Auditory exercises, 2h 7.Auditory exercises, 2h 8.Determination of basic properties of cement (standard consistence and density)., 2h, Learning outcomes:3 9.Concrete composition design, preparation of concrete mixes, testing properties of fresh concrete: consistence, pores, density, sampling., 2h, Learning outcomes:4 10.Auditory exercises, 2h 11.Determining strength and strain of concrete (compressive and tensile strength, modulus of elasticity). Non-destructive testing: sclerometer and ultrasound., 2h, Learning outcomes:5 12.Preliminary exam wood, steel and stone., 2h, Learning outcomes:8 13.Auditory exercises, 2h 14.Preliminary exam concrete., 2h, Learning outcomes:6 15.Preliminary exam bricks, tile, glass., 2h, Learning outcomes:5
Required materials	Basic: classroom, blackboard, chalk Special purpose laboratory Overhead projector Video equipment Using the obligatory literature, Students perform tests in accordance with applicable Croatian standards and prepare obligatory assignments related to the following topics: physical parameters, cement, aggregate, fresh concrete, strength and deformation of concrete, and non-destructive testing. The data acquired during laboratory sessions are partly used by students during preparation of programs.
Exam literature	 Basic literature: 1. Ukrainczyk, V.: Poznavanje gradiva, Institut građevinarstva Hrvatske, Alcor, Zagreb, Udžbenik Sveučilišta u Zagrebu, 2001. 2. Ukrainczyk, V.: Beton: struktura, svojstva, tehnologija, Građevinski fakultet Sveučilišta u Zagrebu, 1994. 3. Bjegović, D. i dr.: Auditorne vježbe, Praktikum, Aktivna nastava, Građevinski fakultet Sveučilišta u Zagrebu, 1994. 4. Ashby Michael F., Joneas David R:H.: Engineering Materials 1, Butterworth-Heinemann, Oxford-Boston-Johannesburg-Melbourne-NewDelhi-Singapore, 1996 5. Illston J.M., Construction Materials, their nature and behaviour, EFN SPON Chapman Hall, London-Glasgow-New mYork Tokyo-Melburne-Madras, 1994
Students obligations	maximum of 3 absences from exercises
Knowledge evaluation during semester	Kolokvij, numeri zadaci#2#30#50\$Kolokvij, teorijska pitanja#3#60#50\$Programski zadatak#1#10#0\$
Knowledge evaluation after semester	The examination consists of the written and oral portions.
Student activities:	AktivnostECTS(Classes attendance)1(Practical work)1(Activity in class)1(Written exam)1(Report)1
Remark	This course can be used for final thesis theme
Prerequisites:	No prerequisites.
ISVU equivalents:	22324:

Code WEB/ISVU	23463/155972	ECTS	5.0	Academic year	2018/2019		
Name	Construction Technolog	JY					
Status	5th semester - Building Construction (Redovni graditeljstvo) - obligatory course5th semester - Civil Engineering (Water and traffic infrastructure) (Redovni graditeljstvo) - obligatory course5th semester - Management in Civil Engineering (Redovni graditeljstvo) - obligatory course5th semester - Civil and Environmental Engineering (Redovni graditeljstvo) - obligatory course						
Teaching mode	Lectures + exercises (auditory + laboratory + seminar + metodology + construction) 30+30 (10+0+0+20) work at home 90						
Teachers	Lectures:2. v.predavač Boris Uremović dipl.ing.građ. Auditory exercises:prof.dr.sc. Vjeran Mlinarić dipl.ing.građ Auditory exercises: Nina Šantek struč.spec.ing.aedif., predavač Auditory exercises:v.predavač Boris Uremović dipl.ing.građ. Auditory exercises: Sanela Vojnović mag.ing.aedif Construction exercises:prof.dr.sc. Vjeran Mlinarić dipl.ing.građ Construction exercises: Nina Šantek struč.spec.ing.aedif., predavač Construction exercises: Nina Šantek struč.spec.ing.aedif., predavač						
Course objectives	Students will learn how work, and to independe communicate with desi	to recognise problems i ently solve technological gners and other particip	n the field of concrete w problems on the constru ants in the construction	vorks, scaffolding, formwo uction site. They will also process.	orks, and assembly be able to properly		
Learning outcomes:	1.analyze design docur 2.formulate key techno 3.draw technological pr 4.organize work proces 5.propose optimum stru 6.manage technologica 7.solve technological is	nents for construction we logical processes. Level: ocess maps. Level:6 ses for realization of con uctures for the realizatio Il processes during realiz sues relating to the reali	ork. Level:6 6,7 n of works. Level:6,7 ation of works. Level:6,7 ation of works. Level:6,7 zation of construction w	5,7 7 rork. Level:6			
Methods of carrying out lectures	In the course of lecture films and video recordin	s, the lecturer continuou ngs showing real-life exa	sly presents technologic mples. Demo-samples a	cal processes through dra are presented for major fo	awings, photographs, prmwork systems.		
Methods of carrying out auditory exercises	Problems are solved on	the blackboard.					
How construction exercises are held	Students independently	y solve problems defined	l by the lecturer.				
Course content lectures	1. lechnique, technolog 2.Production, transport 3.Production, transport 4.Scaffolds and formwo 5.Scaffolds and formwo 7.Selecting and plannin 8.Technique and techni systems, areas and line 9.Equipment for installa 10.Technique and techni 11.Technique and techni 12.Machinery, equipme 13.Machinery, equipme 14.Technology used for 15.Selecting and planni	ly and preparations for c and placement of fresh and placement of fresh orks, 2h, Learning outcom orks, 2h, Learning outcom orks, 2h, Learning outcom g formwork systems and ology of manufacturing outcom ation of concrete product nology for manufacturing nology for manufacturing on and devices for the ir ent and devices for the ir the assembly of buildin ing application of prefab	oncrete work, 2h, Learning c concrete, 2h, Learning c concrete, 2h, Learning c nes:4,5,6 nes:4,5,6 d scaffolds, 2h, Learning concrete products, block es:4,5,7 ts, 2h, Learning outcome g prefabricated elements g prefabricated elements a istallation of elements a stallation of elements a gs, halls and bridges, 2h ricated systems, 2h, Lea	ing outcomes:1,2,3 putcomes:4,5 putcomes:4,5 outcomes:4,5,7 is and small elements (m es:4,5,6,7 s and assemblies , 2h, Le s and assemblies , 2h, Learn nd assemblies, 2h, Learn nd assemblies, 2h, Learn n, Learning outcomes:5,7	anufacturing plants, arning outcomes:4,5,6 arning outcomes:4,5,6 ing outcomes:4,5,7 ing outcomes:4,5,7		
Course content auditory Course content	1.Sliding formwork calc 2.Calculating dispositio 3.Calculating and dime 4.Assembly crane selec 5.Calculation of concret no classes, 2h 6.no classes, 2h 7.no classes, 2h 9.no classes, 2h 10.no classes, 2h 11.no classes, 2h 13.no classes, 2h 13.no classes, 2h 14.no classes, 2h 15.no classes, 2h	ulation and dimensionin n of formwork system al nsioning transport of cor tion and dimensioning, 2 te pressure acting on ho	g, 2h, Learning outcome ong specified wall and c icrete to a construction 2h, Learning outcomes:5 rizontal and vertical forn	es:1,5,7 eiling areas, 2h, Learning site, 2h, Learning outcon 5,7 nwork, 1h, Learning outc	g outcomes:5,7 hes:5,7 omes:1,7		
constructures	2.no classes, 2h 3.no classes, 2h 4.no classes, 2h 5.no classes, 1h Preparation of project a based on skills acquired outcomes:1,5,7 6.Preparation of project	assignment: For a given j d during auditory exercis t assignment: For a giver	olan disposition, student ies, they position the sys n plan disposition, stude	ts have to select the form stem along walls and ceil ints have to select the for	work system and, ings., 1h, Learning mwork system and,		

Required materials	based on skills acquired during auditory exercises, they position the system along walls and ceilings., 2h, Learning outcomes:1,5,7 7.Preparation of project assignment: For a given plan disposition, students have to select the formwork system and, based on skills acquired during auditory exercises, they position the system along walls and ceilings., 2h, Learning outcomes:1,5,7 8.Preparation of project assignment: For a given plan disposition, students have to select the formwork system and, based on skills acquired during auditory exercises, they position the system along walls and ceilings., 2h, Learning outcomes:1,5,7 9.Preparation of project assignment: For a given plan disposition, students have to select the formwork system and, based on skills acquired during auditory exercises, they position the system along walls and ceilings., 2h, Learning outcomes:1,5,7 10.Preparation of project assignment: For a given plan disposition, students have to select the formwork system and, based on skills acquired during auditory exercises, they position the system along walls and ceilings., 2h, Learning outcomes:1,5,7 11.Preparation of project assignment: For a given plan disposition, students have to select the formwork system and, based on skills acquired during auditory exercises, they position the system along walls and ceilings., 2h, Learning outcomes:1,5,7 11.Preparation of project assignment: For a given plan disposition, students have to select the formwork system and, based on skills acquired during auditory exercises, they position the system along walls and ceilings., 2h, Learning outcomes:1,5,7 12.Preparation of project assignment: For a given plan disposition, students have to select the formwork system and, based on skills acquired during auditory exercises, they position the system along walls and ceilings., 2h, Learning outcomes:1,5,7 13.Preparation of project assignment: For a given plan disposition, students have to select the formwork system and, based on skills acquired during auditory exercise
	Video equipment
Exam literature	 Basic literature: 1. Prof. Vjeran Mlinarić : predavanja objavljena na stranici predmeta 2. Gorazd Bučar: Tesarski, armirački i betonski radovi na gradilištu, Građevinski fakultet J.J. Strossmayera u Osijeku 3. Rudolf Lončarić: Organizacija izvedbe graditeljskih projekata, HDGI, 1995 4. bilješke s predavanja i materijali dobiveni na predavanjima I vježbama (uvezana predavanja komplet) Additional literature: 1. www.grad.hr- djelatnici - dr.sci. Zdravko Linarić Dokumenti raspoloživi za download : Postrojenja za proizvodnju gradiva, I.dio, Tvornice betona (betonare) Izbor strojeva i planiranje strojnog rada u građenju, 2. www.grad.hr. Tehnologija građenja visokogradnja - predavanja 3. www.grad.hr Tehnologija građenja 2 - predavanja
Students obligations	maximum of 3 absences from exercises
Knowledge evaluation during semester	Kolokvij, teorijska pitanja#2#100#25\$Programski zadatak#1#0#100\$
Knowledge evaluation after semester	assignment (students must provide explications relating to their assignments) tests examination (the written part of the examination consists of 2 problems; during oral part of the examination students must provide answer to 6 questions related to the course)
Student activities:	Aktivnost ECTS (Project) 2 (Written exam) 3
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot pass this course unless they have passed Građevinski strojevi Students cannot enroll in this course unless they have passed Proračun konstrukcija Students cannot enroll in this course unless they have passed Matematika II Students cannot enroll in this course unless they have completed Građevinski strojevi
ISVU equivalents:	22362;
Proposal made by	v.predavač Boris Uremović dipl.ing.građ., 17.9.2018

Code WEB/ISVU	23448/155949	ECTS	3.0	Academic year	2018/2019
Name	Descriptive Geometry	/ in Civil Engineerin	g l		
Status	1st semester - Under	araduate profession	nal study in civil engin	eering (Redovni graditelistvo) -	obligatory course
Teaching mode	Lectures + exercises	(auditory + laborat	tory + seminar + meto	odology + construction)	15+15 (7+0+0+8)
,	work at home	(,		60
Teachers	Lectures:1. dr.sc. Mire	ela Katić-Žlepalo pr	of.mat.		L
	Lectures:2. Ivana Bož	ić Dragun dipl.prof.	.mat.		
	Auditory exercises: Iv	vana Božić Dragun o	dipl.prof.mat.		
	Auditory exercises:dr	.sc. Mirela Katić-Žle	epalo prof.mat.		
	Construction exercise	es: Ivana Božić Drag	gun dipl.prof.mat.		
	Construction exercise	es:dr.sc. Mireia Kati	c-Ziepalo prof.mat.		
Course objectives	Development of stude	ents spatial percept	tion, creative thinking	, and spatial problem solving us	ing structural method
Learning outcomes:	1.develop spatial per	ception. Level:6,7			
	2.solve spatial proble	em by a structural m	hethod. Level:o	ng Lovel:6	
	4.draw orthogonal pr	oiection of geometr	ric objects using the M	onges method. Level:6	
	5.analyse stereometr	ic relations in ortho	gonal projection of ge	ometric bodies. Level:6	
	6.make a three-dime	nsional sketch base	d on orthogonal proje	ctions given on a two-dimensior	al drawing. Level:6
Methods of carrying	Ex cathedra teaching				
out lectures	Other				
	PowerPoint step-by-st	tep presentations.			
Methods of carrying	Other				
out auditory	Problems are solved a	at the blackboard o	r on computer.		
	Othor				
now construction	Each student designe	s his drawing on n	aner Lecturers correct	ions are obliged	
Course content	1 Introduction to Mon	ac mothod Project	stions of a point and a	line segment 1h Learning out	comos:1.3.4
lectures	2 Projections of line	Points of intersection	on of line Inclined and	les of line Two lines Projection	s of plane figures 1h
	Learning outcomes:1	.3.4	in or line. Inclined drig		, or plane lightest, in,
	3.Projections of plane	e. Point and line in p	plane., 1h, Learning ou	tcomes:1,3,4	
	4.Costructing plane to	races. Two planes.	Intersection of line and	d plane. Perpendicularity., 1h, L	earning outcomes:1,3,4
	5.Side view., 1h, Lear	ning outcomes:1,3	,4		
	6.Projections of plane	e shapes. Shapes in	projecting plane., 1h,	Learning outcomes:1,3,4	4
	7.Shape in oblique pla	ane. Rotation of pla	ine. Perspectival attini	ty., In, Learning outcomes:1,3,4	ŧ
	9. Projections of circle	Circle in projectio	g and in oblique plane	Construction of ellipse. 1h. Le	arning outcomes:1.3.4
	10.Projections of geometrical solids. Regular polyhedra., 1h, Learning outcomes:1,2,3,4,5,6 11.Projections of geometrical solids with base in projecting plane., 1h, Learning outcomes:1,2,3,4,5,6				
	12.Projections of geo	metrical solids with	base in oblique plane	., 1h, Learning outcomes:1,2,3,4	4,5,6
	13.About surfaces of	2nd order. Surface	sections., 1h, Learnin	g outcomes:1,2,3,4,5,6	
	14.Cone sections., 1h	i, Learning outcome	es:1,2,3,4,5,6		
	15.Second preliminar	y exam., 1h, Learn	ing outcomes:1,2,3,4,	5,6	
Course content	1 Points lines planes		r polygons 1h Learni	ng outcomes:1.3.4	
auditory	2.Monges method. Or	rthogonal projection	ns of point. line-seame	ent, line., 1h. Learning outcomes	\$:1.3.4
	3.Two lines. Plane. Pc	pint, line and shape	in plane., 1h, Learnin	g outcomes:1,3,4	
	4.Constructing plane	traces. Two planes	. Intersection point of	line and plane., 1h, Learning ou	tcomes:1,3,4
	5				
	6.Perpendicularity. Si	de view., 1h, Learn	ing outcomes:1,3,4		
	7 9 Projections of chan	oc Shanos in projo	sting plane 1h Learn	ing outcomposil 2.4	
	9 Projections of shape	es. Shapes in projectes in oblique blane	Affinity 1h Learning	outcomes 1,3,4	
	10	es in oblique plune.	, annieg., 11, Leannig	000001103.1,5,1	
	11				
	12				
	13				
	14				
	15				
Course content	1.				
constructures	2				
	3				
	4				
	5.Dealing with spatia	l relations., 1h, Lea	rning outcomes:1,3,4		
	6				
	7.Dealing with metric	ai method., In, Lea	arning outcomes:1,3,4		
	9				
	10.Desian of projection	ons of aeometric sh	apes., 1h. Learning or	itcomes:1,3.4	
	11.Design of projection	ons of geometric so	lids., 1h, Learning out	comes:1,2,3,4,5,6	
	12.Design of projection	ons of geometric so	lids with base in obliq	ue plane., 1h, Learning outcome	es:1,2,3,4,5,6
	13.Students individua	al work - projections	s of geometric solids.,	1h, Learning outcomes:1,2,3,4,	5,6
	14.Students individua	al work - projections	s of geometric solids.,	1h, Learning outcomes:1,2,3,4,	5,6 F. C
	15.Students individua	ai work - projections	s of geometric solids.,	In, Learning outcomes:1,2,3,4,	0,0



Required materials	Basic: classroom, blackboard, chalk Overhead projector		
Exam literature	Basic literature: 1. K. Horvatić-Baltasar, I. Babić: Nacrtna geometrija, SAND d.o.o., Zagreb, 1997. Additional literature: 2. I. Babić, S. Gorjanc, A. Sliepčević, V. Szirovicza: Nacrtna geometrija-zadaci, HDGG, Zagreb, 2011. 3. M. Katić Žlepalo, I. Božić: Nacrtna geometrija u graditeljstvu 1 - skripta za vježbe 4. V. Szirovicza, E. Jurkin Deskriptivna geometrija CD, Zagreb, 2005.		
	5. Linkovi na materijale na web: http://moj.tvz.hr/index.php?pred=18103		
Students obligations	Regular attendance. Student's task (design of geometrical solid). Homework. Two preliminary exams. Both pre-exams should be completed with minimum 40% score to be allowed to take a final exam.		
Knowledge evaluation during semester	Two preliminary exams. Both pre-exams should be completed with minimum 70% in order to be exempt from the final exam.		
Knowledge evaluation after semester	Written exam. Oral exam.		
Student activities:	Aktivnost ECTS (Written exam) 3		
Remark	This course can not be used for final thesis theme		
Prerequisites:	No prerequisites.		
ISVU equivalents:	38169;39048;		

Code WEB/ISVU	23937/184741	ECTS	3.0	Academic year	2018/2019
Name	Descriptive Geometry	in Civil Engineering II		-	
Status	2nd semester - Under	graduate professional stu	ıdy in civil engineering (R	edovni graditeljstvo) - o	bligatory course
Teaching mode	Lectures + exercises (auditory + laboratory +	seminar + metodology +	construction)	15+30 (8+0+0+22)
	work at home				45
Teachers	Lectures:1. dr.sc. Mire	la Katić-Žlepalo prof.mat			
	Lectures:2. Ivana Boži	ć Dragun dipl.prof.mat.	of mot		
	Auditory exercises: IVa	sc. Mirela Katić-Žlenalo n	rof mat		
	Construction exercises	s: Ivana Božić Dragun dip	l.prof.mat.		
	Construction exercises	s:dr.sc. Mirela Katić-Žlepa	alo prof.mat.		
Course objectives	Students will acquire s	spatial perception and cre	eative thinking ability, an	d be able to solve spatia	al problems using a
	structural method.			-	
Learning outcomes:	1.develop spatial perc	eption. Level:6,7			
	2.solve structural prob	plem using a structural m	ethod. Level:6		
	3.draw a three-dimens	sional object on a two-dir	nensional drawing using t	the oblique axonometry	method. Level:6
	4.draw a three-dimens	the plane and geometric	nensional drawing using a	the oblique projection m	lethod. Level:6
	6.differentiate section	curves in the intersection	n of the plane and geome	etrical body. Level:6	
	7.find solution for covering the facility with roof planes. Level:6				
	8.draw simple geomet	rical objects and tasks us	sing elevation projection.	Level:6	
	9.solve layout plan for	earthworks along the ro	adway using elevation pr	ojection, include access	ory facilities
	(embankment, cutting	, canal). Level:6			
Methods of carrying	Ex cathedra teaching				
outlectures	Other Solving tasks on the b	lackhoard PowerPoint st	on-hy-ston procentacions		
Methods of carrying	Othor		ep-by-step presentasions	•	
out auditory	Tasks are solved on th	ne blackboard, students a	re proactive.		
exercises					
How construction	Computer simulations				
exercises are held	Other				
	Students solve their ta	asks individually, with the	e help from teacher.		
Course content	1.Intersections of cylin	nder., 1h, Learning outco	mes:1,2,5,6		
lectures	2.Axonometry of point	s, line-segments, cone, c	bject. Rytz method., 1h,	Learning outcomes:1,3	
	3.Intersection of cone	in axonometry., 1h, Lear	ning outcomes:1,3,5,6		
	4.0blique projection of	f point, line-segment, ge	ometrical solid, object., 1	h, Learning outcomes:1,	,4
	5.Roofing. Plan view of 6 Roofing. Front view	f roof., In, Learning outc	omes: /		
	7 Projection with eleva	ations Line and plane in	elevation projection 1h	Learning outcomes 8	
	8 First preliminary exa	am 1h	elevation projection., in,	Learning outcomes.o	
	9.Elementary tasks in	elevation projection 1h	Learning outcomes:8		
	10.Topographic surfac	es. Intersection of topog	raphic surface with plane	., 1h, Learning outcome	s:8
	11.Structural solution	for an earthwork situatio	n using the embankment	and cutting plane placi	ng method - horizontal
	straight traffic route.,	1h, Learning outcomes:9			
	12.Structural solution	for an earthwork situatio	n using the embankment	and cutting plane placi	ng method - horizontal
	circular curved traffic	route., 1h, Learning outc	omes:9 n using the embankment	and cutting plane place	na mothod clana
	13.Structural solution	tor an earthwork situatio	n using the embankment	and cutting plane place	ng method - slope
	14 Traffic routes in tw	o levels. Crossroads of a	road and a railway track	1h Learning outcomes	s·9
	15.Second preliminary	exam., 1h		, in, leaning outcomes	
	, ,				
Course content	1.Intersections of cone	e with three projecting pl	anes. Intersections of cyl	inder., 2h, Learning outo	comes:1,2,5,6
auditory	2.Intersections of sphe	ere. Axonometry of cone	intersection., 2h, Learnin	g outcomes:1,2,3,5,6	
	3				
	4 5 Avonomotry of an ol	hight Oblique projection	of wood connections 2h	Learning outcomes:1.2	2 4
	6	oject. Oblique projection	of wood connections., 21	, Learning outcomes.1,2	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	7				
	8				
	9				
	10				
	11.Elevation projection	n - theoretical tasks., 2h,	Learning outcomes:8		
	12				
	13				
	15 -				
	10.				
Course content	1				
constructures	2				
	3.1st program - interse	ections of cone or cylinde	er by planes - Monge met	hod., 2h, Learning outco	omes:1,2,5,6
	4.1st program - interse	ections of cone or cylinde	er by planes - axonometri	c method., 2h, Learning	outcomes:1,2,3,5,6
	5 C 2nd nor 1995	analysis of the shift of the	Learning		
	b.2nd program - axono	ometry of an object., 2h,	Learning outcomes:1,2,3	autcomes 1 2 4	
	8 3rd program - roof -	computer classroom - Au	inections., 211, Learning C	romes:7	
	9.3rd program - roof -	top view - computer class	sroom - AutoCAD 2h Le	arning outcomes.7	
I				sacomes.	

	10.3rd program - roof - front view - computer classroom - AutoCAD., 2h, Learning outcomes:7
	11 12.Structural solution for an earthwork situation using the embankment and cutting plane placing method., 2h, Learning outcomes:8,9
	13.4th program - earthwork and traffic routes using contour method., 2h, Learning outcomes:8,9
	14.4th program - earthwork and traffic routes using contour method., 2h, Learning outcomes:8,9
	15.4th program - earthwork and traffic routes using contour method., 2h, Learning outcomes:8,9
Required materials	Basic: classroom, blackboard, chalk
	Overhead projector
	Students solve their tasks individually, with the help from teacher.
Exam literature	Obavezna literatura: 1) I. Babić, S. Gorjanc, A. Sliepčević, V. Szirovicza: Nacrtna geometrija-zadaci, HDGG, Zagreb, 2011.
	Dopunska literatura:
	D) K Horvatić-Baltasar I Babić: Nacrtna geometrija SAND d.o.o. Zagreb 1997
	3) V. Strovicza, E. Jurkin Deskriptivna geometrija, D. Zagreb, 2005.
	Linkovi na materijale na web: http://moj.tvz.hr/index.php?pred=18366
Students obligations	4 programs (student's individual tasks).
_	3 homeworks.
	Both pre-exams should be completed with minimum 40% score to be allowed to take final exam.
	Regular attendance.
Knowledge	Two preliminary exams. Both pre-exams should be completed with minimum 70% in order to be exempt from the final
evaluation during	exam.
semester	
Knowledge	Written exam.
evaluation after	Oral exam.
semester	
Student activities:	Aktivnost ECTS
	(Written exam) 3
Remark	This course can not be used for final thesis theme
Prerequisites:	Students cannot pass this course unless they have passed Nacrtna geometrija u graditeljstvu l
	Students cannot enroll in this course unless they have completed Nacrtna geometrija u graditeljstvu l
ISVU equivalents:	22339;38170;155950;

Code WEB/ISVU	22880/22335	ECTS	2.0	Academic year	2018/2019
Name	Elementary Geology				-
Status	2nd semester - Underg	raduate professional stu	ıdy in civil engineering (F	Redovni graditeljstvo) - o	bligatory course
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory +	seminar + metodology +	- construction)	15+15 (15+0+0+0) 30
Teachers	Lectures:1. dr.sc. Tatja	na Vlahović prof.v.škole	v čkolo		
Course objectives	Acquiring elementary k	Acquiring elementary knowledge on geology in order to recognize geological problems in civil engineering and to be			
	able to communicate w	ith geologists and other	experts involved in cons	struction work.	
Learning outcomes:	1.anticipate geological 2.differentiate betweer 3.specify different type 4.comment on specific 5.define the ways in wl 6.analyse and interpret 7.propose the use of ro	.differentiate between individual types of rocks and minerals. Level:6 .specify different types of geological structures. Level:6 .comment on specific ground-surface processes and their consequences. Level:6 .define the ways in which geological processes influence construction of engineering structures. Level:6,7 .analyse and interpret geological maps. Level:6 .propose the use of rock as a natural construction material. Level:6,7			
Mothoda of counting	Ex esthedrs to ching				
out lectures	Case studies Discussion Questions and answers Other				
	Geological phenomena photographs as well as lectures, students will of During the lectures sor thinking. This will also	, rocks and mineralogica samples of minerals an get notes. Explanations ne questions will arose a nelp them in practical w	al composition are explai d rocks to make the und for particular terminolog asking for active participa ork to find answers and g	ned with the use of simp erstanding easier. For so y will be given by using e ation of students and de get to conclusions in son	Ile models, drawings and me chapters and for all examples for the field. veloping their way of ne particular problems.
Methods of carrying	Group problem solving				
out auditory exercises	Other Practical part of the lec	tures will be given throu	ugh the auditory exercise	es. Learning objectives w	ill be connected with the
Course contout	particular examples wr	lich can be explained ar	a solved through the act	live participation of stude	ents.
lectures	 Introduction to geology. Composition of the Earth. Lithosphere. Minerals. Crystals. Physical and chemical proper minerals., 2h, Learning outcomes:1 2.Main petrogenic minerals (silicates and non-silicates) composition and systematisation, 2h, Learning outcomes: 			earning outcomes:2	
	3. Igneous rocks: struct	tures, textures, systema	itisation, 2h, Learning ou	tcomes:2	
	4.Metamorphic rocks: 0	tructures textures syst	ematisation (clastites an	nes:2 Id carbonates) 2h Learr	ing outcomes 2.3
	6.Geologic time. Deter	6.Geologic time. Determining age of rocks. Chronostratigraphic and lithostratigraphic classification of geologic past, 21			
	Learning outcomes: b 7.Geologic structures. I descriptive characteris 8.Hydrogeology the rol movement of ground w classification of aquifer 9.Hydrogeology the rol	Primary and secondary : tics, classification and ir e in civil engineering. H rater, physicochemical p s, classification of sprin e in civil engineering. H	structures. Secondary str npact on the stability of s ydrological cycle. Ground properties of ground wate gs, 2h, Learning outcome ydrological cycle. Ground	uctures: joints, faults fau slopes, 2h, Learning outo I water porosity and perr er; hydrogeological funct es:4 I water porosity and perr we bydrogeological funct	ult systems and folds comes:3 meability of the rocks, ion of rocks, meability of the rocks,
	classification of aquifer 10.Hydrogeology the ro movement of ground w	s, classification of sprin ble in civil engineering. I vater, physicochemical p	gs, 2h, Learning outcome Hydrological cycle. Grour properties of ground wate	es:4 ad water porosity and pe er; hydrogeological funct	rmeability of the rocks, ion of rocks,
	classification of aquifer 11.Geology and hydrog	s, classification of sprin leology of karst. Weathe	gs, 2h, Learning outcome ering processes in carbon	es:4 ate rocks. Morphologica	l features of karst:
	sinkholes, ponors, cave 12.Geology and hydrog	es and pits, 2h, Learning jeology of karst. Weathe	outcomes:4 ering processes in carbon	ate rocks. Morphologica	I features of karst:
	sinkholes, ponors, cave 13.Basic hydrogeologic hydrogeological investi structuros, investigatio	es and pits, 2h, Learning al investigations in civil gations for realization o p of ground water for w	outcomes:4 engineering methodolog f engineering and others	y and content of hydrog structures drying of bott	eological investigations, om outlets, Hydraulic
	14. Role of engineering properties of rocks and 15. Role of engineering properties of rocks and	geology in civil engine engineering problems. geology in civil engine engineering problems.	Geodynamic processes., ering. Classification of ro Geodynamic processes., ering. Classification of ro Geodynamic processes.,	 cks: geological descriptic 2h, Learning outcomes: cks: geological descriptic 2h, Learning outcomes: 	on, engineering 5,6 on, engineering 5,6
Course content	1.Determination of roc	<s igneous,="" metamorphi<="" th=""><th>c und sedimentary rocks</th><th>, 2h, Learning outcomes</th><th>:2</th></s>	c und sedimentary rocks	, 2h, Learning outcomes	:2
auditory	2.Geologic maps: what geological maps M 1: 1 3. Interpretation of geo 4.Pumping test and def outcomes:4,5 5.Pumping test and def outcomes:4,5 6.Typical examples of r outcomes:4,5 7.Geodynamic process: Landslides. Subsidence 8.Geodynamic process Landslides. Subsidence	they show, how they ar 00 000, 2h, Learning ou logic structures, 2h, Lea termination of hydroged morphologic features an es: Risk and estimation the Expanding soil. Process es: Risk and estimation the Expanding soil. Process	e made and used. Example tromes:6 anning outcomes:3 logical parameters from logical parameters from d hydrogeological struct of geohazards. Earthqua ses on the coast, 2h, Lea of geohazards. Earthqua	the pumping test data, 2 the pumping test data, 2 the pumping test data, 2 ures in karst terrains of 0 kes and related processe arning outcomes:4,5 kes and related processe arning outcomes:4,5	nation of Basic 2h, Learning 2h, Learning Croatia, 2h, Learning 25. Volcanism. 25. Volcanism.
	s. Lanusilue examples		e, Zii, Learning outcomes	, J, I	

	 10.Basic engineering geological investigations in civil engineering: elements and type of investigations. Tunnels. Hydraulic structures. Roads. Geophysical investigations. Exploratory drilling, 2h, Learning outcomes:5,7 11.Basic engineering geological investigations in civil engineering: elements and type of investigations. Tunnels. Hydraulic structures. Roads. Geophysical investigations. Exploratory drilling, 2h, Learning outcomes:5,7 12.Basic engineering geological investigations in civil engineering: elements and type of investigations. Tunnels. Hydraulic structures. Roads. Geophysical investigations. Exploratory drilling, 2h, Learning outcomes:5,7 12.Basic engineering geological investigations in civil engineering: elements and type of investigations. Tunnels. Hydraulic structures. Roads. Geophysical investigations. Exploratory drilling, 2h, Learning outcomes:5,7 13.Environmental Geology. General aspects of exploitation of mineral deposits. Pollution and protection of ground water. Typical examples from Croatia and existing legislation, 2h, Learning outcomes:7 14.Environmental Geology. General aspects of exploitation of mineral deposits. Pollution and protection of ground water. Typical examples from Croatia and existing legislation, 2h, Learning outcomes:7 15.Visit to interesting hydrogeological/engineering-geological structures. Visit to the Faculty of Mining, Geology and Petroleum Engineering, 2h, Learning outcomes:1
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Overhead projector Video equipment
Exam literature	 Obvezna literatura : 1. Vlahović, T. (2010): Geologija za građevinare. Sveučilište u Splitu. Građevinsko-arhitektonski fakultet, Split. Materijali dobiveni na predavanjima i vježbama. Dopunska literatura: 1. Šestanović, S. (1990): Osnove geologije i petrografije. Primjena u građevinarstvu. 2. izmijenjeno i dopunjeno izdanje, Školska knjiga, Zagreb. 2. Plummer, C.C., McGeary, D., Carlson, D.H (1999): Physical geology. 8th Edition, WCB, cGraw-Hill Publishers, Boston Toronto. 3. Domenico, P.A. Schwartz, F.W. (1997): Physical and chemical hydrogeology. J. Willey sons. 4. Goodman, R.E. (1993): Engineering geology. Rock in engineering construction. John Wiley and So., New York, 412 p. 5. Tišljar, J. (1999): Petrologija s osnovama mineralogije. 1-212, Udžbenici Sveučilišta u Zagrebu, RGN fakultet, Zagreb. 7. Šestanović, S. (1993): Osnove inženjerske geologije. Primjena u graditeljstvu. Geing, Split.
Students obligations	maximum of 3 absences from exercises
Knowledge evaluation during semester	Redovitost pohaa#10#0#50\$Kolokvij, teorijska pitanja#2#100#50\$
Knowledge evaluation after semester	four colloquium during the semester are planned, at the end of each lecture series: 1. composition of the lithosphere, mineralogy and petrology, 2. listening and understanding of the geological map, 3. hydrogeology, 4. engineering geology
Remark	This course can not be used for final thesis theme
Prerequisites:	No prerequisites.

Study programme for	academic year	2018/2019
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Code WEB/ISVU	23917/184644	ECTS	6.0	Academic year	2018/2019
Name	Engineering Mechanics				
Status	1st semester - Undergr	aduate professional stud	ly in civil engineering (Re	edovni graditeljstvo) - ok	ligatory course
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + s	seminar + metodology +	construction)	45+30 (24+0+0+6) 105
Teachers	Lectures:1. mr.sc. Željk Lectures:2. dr.sc. Dalib Auditory exercises:mr.s Auditory exercises:dr.sd Auditory exercises:mr.s Construction exercises: Construction exercises:	to Lebo v. pred. or Gelo mag.ing.aedif. or. Jure Galić predavač c. Dalibor Gelo mag.ing.a sc. Željko Lebo v. pred. tmr.sc. Jure Galić predav. dr.sc. Dalibor Gelo mad.	aedif. ač ing.aedif.		1
Course able atives	Construction exercises:	mr.sc. Željko Lebo v. pre	ed.	, ita una in ciuil ancience	inn an a bhair far munna
Course objectives	Acquiring basic knowled understanding of profes	dge in structural mechar ssional courses	nics, with an emphasis of	n its use in civil engineer	ring as a basis for proper
Learning outcomes:	check balance of a material point and body. Level:6 2.calculate required balancing forces and moments for a material point and body subjected to load. Level:6 3.compare state of balance of material points and bodies. Level:6,7 4.calculate internal forces in a straight member. Level:6 5.calculate cross-sectional geometrical properties of a member. Level:6 5.calculate extreme stress field, namely the biaxial homogeneous stress field of a straight member. Level:6 8.calculate extreme stress values for given forces within the members cross-section. Level:6 9.analyse state of stress needed to ensure mechanical safety and stability of a straight member. Level:6 10.evaluate strain field of a straight member. Level:6 11.Predict friction force. Level:6,7				
Methods of carrying out lectures	Ex cathedra teaching Case studies Modelling Discussion Questions and answers Basic elements of technical mechanics are explained based on numerical and graphical procedures. The state of equilibrium is studied on design models and, instead of tests, similar examples from natural environment and civil engineering practice are presented.Students are also provided with up to date lecture notes containing additional information.				
Methods of carrying out auditory exercises	Group problem solving problem solving with ac	Group problem solving problem solving with active participation of students			
How construction	Group problem solving				
Course content	1 Introduction to Techn	ical mechanics Basic lay	ws and methods. Interna	tional System of Units	3h Learning
lectures	2.The concept of force - 3.Equilibrium forces, th 4.Equilibrium point and 5.First Colloquium, 2h, 6.Equilibrium of bar ele 7.Linear bar element. Ir 8.Analyze and drawing 9.Differential relation b Learning outcomes:2,3, 10.Mechanics of the sol 11.Second Colloquium, 12.Deformation fields. 1 Maximal shear deformat 13.Basic assumptions of element. Concept limit 14.Friction., 3h, Learnir 15.Third Colloquium, 3H	and moments. Force and e material points and bo bodies . Equilibrium of the Learning outcomes:1,2,3 ment. The concept of int internal forces in linear bo of internal forces diagra etween internal forces a ,4,5 lid body. Concept of stre 3h, Learning outcomes: Relation between stress ations., 3h, Learning out of bar element mechanic: stress., 3h, Learning ou ng outcomes:11 h, Learning outcomes:6,7	ws and methods. Interna d moment definition and dy, 3h, Learning outcom bodies in plane., 3h, Lear ternal forces., 3h, Learning ms., 3h, Learning outcom nd external forces. Conc ss, displacements and de 6,7 and deformations. Hooke comes:6,7,8,9,10 s. Relation between inter tcomes:7,8,9,10 7,8,9,10,11	representation., 3h, Lea les:2,3 ming outcomes:2,3,4 g outcomes:2,3,4,5 nes:2,3,4,5 ept of concentrated forc eformation., 3h, Learnir e low. Biaxial stress field rnal forces and deformat	rning outcomes:1 es and moments., 3h, ng outcomes:2,3,4,5 ls. Principal stress. tions on the linear bar
Course content auditory	1.Equilibrium of point ir 2.Equilibrium of bodies 3.Equilibrium of bodies 4.No classes., 2h 5.Internal forces., 2h, L 6.Internal forces., 2h, L 7.Internal forces., 2h, L 9.No classes., 2h 10.Center of gravity an 11.Moment of inertia, s 12.Mohr circles, 2h, Lea 13.Friction, 2h, Learnin 14.No classes., 2h 15.Preparations for the	n plane., 2h, Learning ou in plane., 2h, Learning ou in plane. Ritter and Culn earning outcomes:4 earning outcomes:4 earning outcomes:4 d moment of inertia., 2h tatic moment, Steiner, 2 arning outcomes:6,7,8,9, g outcomes:11 final exam., 2h, Learning	tcomes:1 putcomes:2,3 nann method., 2h, Learn , Learning outcomes:6 h, Learning outcomes:6, 10 g outcomes:1,2,3,4,5,6,7	ing outcomes:2,3 7,8,9,10 7,8,9,10,11	



Zagreb University of Applied Sciences

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Course content	I.No classes., 2h		
constructures	2.No classes., 2h		
	3.No classes., 2h		
	4.Constructive exercises for the first colloquium., 2h, Learning outcomes:1,2,3		
	5.No classes., 2h		
	6.No classes., 2h		
	7.No classes., 2h		
	8.No classes., 2h		
	9.Constructive exercises for the second colloquium., 2h, Learning outcomes:5		
	10.No classes., 2h		
	11.No classes., 2h		
	12.No classes., 2h		
	13.No classes., 2h		
	14.Constructive exercises for the third colloquium., 2h, Learning outcomes:6,7,8,9,10		
	15.No classes., 2h		
Required materials	Basic: classroom, blackboard, chalk		
	Overhead projector		
	Problem solving with active participation of students		
Exam literature	Obavezna:		
	1. Ž. Lebo: Separati predavanja na web-u		
	2. H. Werner: Tehnička mehanika, skripta, Zagreb, 1986.		
	2. Z. Despot: Separati predavanja.		
	3. V. Šimić: Otpornost materijala I., Školska knjiga, Zagreb, 1992.		
	4. H. Werner: Mehanika I., HSGI, 2007.		
	Additional literature		
	1 V Šimić Otoornost materijala II. Školska knjiga. Zagreb. 1995.		
	2. Li Smile super-Natilevac. Zbirka zadataka iz Tehničke mehanike skrinta, na mrežnim stranicama nredmeta i u		
	Auguratinici - Augurati - separati za vježbe, u koniraonici		
	 A. Biočoni primicka metalalika - separati za vježuče u Kupiratiliti. 4. Biočoni primick koluvila i ipitnih zadataka pa mrožnim stranicama prodmeta. 		
Students obligations	Class attendance. Minimum of 75 points in three exams.		
Knowledge	Class attendance. Exams: numerical examples, theoretical questions. Minimum 180 points from possible 300 in three		
evaluation during	colloquiums.		
semester			
Knowledge	Written and werbal exam		
evaluation after			
semester			
Student activities:	Aktivnost ECTS		
	(Classes attendance) 2		
	(Constantly tested knowledge) 2		
	(Written exam) 1		
	(Oral exam) 1		
Remark	This course can not be used for final thesis theme		
Prerequisites:	No prerequisites.		
ISVU equivalents:	22323;		
Proposal made by	mr.sc. Željko Lebo v. pred., dr.sc., Dalibor Gelo mag.ing.aedif.		

Code WEB/ISVU	23351/147431	ECTS	4.0	Academic year	2018/2019
Name	English language I			-	
Status	3rd semester - Undergr	raduate professional stud	ly in civil engineering (R	edovni graditeljstvo) - el	lective course
Teaching mode	Lectures + exercises (a	auditory + laboratory + s	eminar + metodology +	- construction)	30+30 (30+0+0+0)
	work at home				60
Teachers	Lectures:1. dr.sc. Ivana	Spiranec prof. visoke šk	ole		
	Auditory exercises:dr.s	c. Ivana Spiranec prof. vi	soke škole		
Course objectives	The main objective is to	o develop the capability	to understand technical	texts, find relevant infor	mation, and to teach
Learning outcomes:	1 use acquired ability t	o properly consult techni	Ical texts and find releva	ant information while rea	ding professional and
Learning outcomes.	research texts. Level:	o property consult teerin		Internormation while rea	and professional and
	2.demonstrate knowled	dge of technical terminol	ogy and efficient use of	this terminology in comr	nunication. Level:
	3.demonstrate proficie	ncy in the use of gramma	atical structures that are	e typical for technical tex	ts. Level:
	4.interpretirati pročitar	ni tehnički tekst te izložiti	svoje mišljenje o pročit	anom. Level:	
	5. Improve proficiency i	n the use of all four lang	uage skills. Level: bilingual dictionaries	ovol	
	7.translate professiona	l papers from English lar	guage to Croatian langu	Jage, Level:	
	8.show knowledge of c	ollocations in English lan	guage, i.e. structures in	which culturology differe	ences between the
	English and Croatian la	inguages can clearly be s	seen. Level:		
Methods of carrying	Ex cathedra teaching				
out lectures	Discussion				
Methods of carrying	Group problem solving				
out auditory	Discussion, brainstorm	ing			
exercises	Interactive problem sol	lving			
	Workshop				
Course content	1.ESP- English for speci	ific purposes- aims Englis	sh as a lingua franca, 2h	, Learning outcomes:1,5	,8
lectures	3.Tense review. 2h. Lea	arning outcomes: 3	arning outcomes.z		
	4.Collocations- definition	on and examples, Cultura	l differences, 2h, Learni	ng outcomes:2,7,8	
	5.Watching video clips	career options in civil en	gineering - discussion Li	stening and speaking sk	ill, 2h, Learning
	outcomes:1,5				
	6.Nouns with irregular	plural Vocab building - p	eople involved in buildin	g, types of works in build	ling, tools and
	7 Who needs a degree	2n, Learning outcomes: ? Relevant vocabulary di	scussion 2h Learning c	utcomes:1	
	8.Reading and listening	skill theoretical prereau	isites. 2h. Learning outo	comes:1.5	
	9.The most impressive structures in the world, 2h, Learning outcomes:4 10.Passive voice, 2h, Learning outcomes:3 11.Energy renewable and non-renewable, 2h, Learning outcomes:1,2,7 12.Prepositions of time and place, verbs + prepositions, adjectives + prepositions, 2h, Learning outcomes:3 13.What is a fluid? T/F questions, discussion, quiz, 2h, Learning outcomes:1,4 14.Independent learning- developing reading and listening skill, working with dictionaries, 2h, Learning outcome				
					autoomoo:2
					outcomes:5
					earning outcomes:5,6
	15.Preparation for the	second pre-exam, tasks,	2h, Learning outcomes:	4	-
Course content	1.Facts about English la	anguage. Reading skill a	nd related vocabulary, 2	h, Learning outcomes:1,	4,7,8
auditory	2.Prefixes and suffixes-	- practice, working with a	tions 2b Learning outs	, 2n, Learning outcomes	.:2,6,7,8
	4.Working with a dictio	nary of collocations. Rea	ding skill, speaking skill.	2h. Learning outcomes	:1.5.6
	5.Speaking about stude	ents, 2h, Learning outcor	nes:2,5,6,7,8	, , j	
	6.Speaking skill - negot	tiations., 2h, Learning ou	tcomes:2,5,8		
	7.What is the coolest ci	Ivil engineering subdivisi	on?, 2h, Learning outcor	nes:1,4,5	
	9. Students prepare pre	esentations about famous	structures, presentatio	n skills., 2h. Learning ou	tcomes:5
	10.Passive- exercises.,	2h, Learning outcomes:2	2,3,8		
	11.Energy - related voc	cabulary, word building.,	2h, Learning outcomes:	2,4,6,7,8	
	12.Prepositions- exerci	ses, Reading skill, Writin	g skill., 2h, Learning out	comes:3,5,8	
	13. Vocabulary practice	e. Prepositions- practice, .	2n, Learning outcomes:2 er 2h Learning outcom	.',δ es·1 2 3 4 5	
	15.Second pre-exam.	2h. Learning outcomes:1	.2.3.6.7.8	23.1,2,3,4,5	
Required materials	Basic: classroom, black	board, chalk			
	Whiteboard with marke	ers			
	video equipment				
Evam literature	Basic literature:				
	1. English for Civil Engl	neers. Špiranec. I., TVZ.	Zagreb. 2010.		
	Preporučena dopunska	literatura:	and Henry Challet t	1 Čkalaka kalima Za	h 1000
	2 Ilustrirani riečnik arh	nglish for Academic Purp litekture i građevinarstva	uses, Hercezi-Skalicki, M Vulelija 7 Masmedia	 JAGRED 2008 	D, 1993.
	3.Trojezični građevinsk	i rječnik, Prager A., 2003	., . arenja, <u>e</u> r, masmeula,		



Students obligations	Regular attendance and being active in lesson, maximum 3 absences from exercises and lectures allowed.		
Knowledge evaluation during semester	Students take two pre-exams per semester. If they pass, they are exempt from the final exam. If they fail, they are obliged to take the final exam. They also have oral examination.		
Knowledge evaluation after semester	Students take final written exam as well as oral exam.		
Student activities:	AktivnostECTS(Written exam)3(Oral exam)1		
Remark	This course can not be used for final thesis theme		
Prerequisites:	No prerequisites.		
ISVU equivalents:	39032;39047;143321;		
Proposal made by	Ivana Špiranec, PhD, senior lecturer		

Code WEB/ISVU	23352/147432	ECTS	2.0	Academic year	2018/2019	
Name	English Language II	·				
Status	4th semester - Undergr	raduate professional stud	dy in civil engineering (R	edovni graditeljstvo) - el	ective course	
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + s	seminar + metodology +	- construction)	15+15 (15+0+0+0) 30	
Teachers	Lectures:1. dr.sc. Ivana	a Špiranec prof. visoke šl			<u>[-</u> -	
Course objectives	Auditory exercises: ar.s	c. Ivana Spiranec prof. v	ISOKE SKOIE	plication how to make a	presentation and how	
course objectives	to participate in a job in dictionaries (monolingu	nterview in English langu ual and bilingual), which	uage. Students will also a will assist them in impro	be taught how to efficient oving their English langua	ly use various ge skills and	
learning outcomes:	1 formulate resume (C)	V) and job application in	English language evel	·6 7		
	2.analyse technical tex attitude to the text. Lev 3.prepare and present	vel:6 orally a specific topic aft	er having learned basic	r to motivate students to rules for making a succe	develop a critical ssful oral presentation.	
	4.write an abstract and 5.analyse composite w Level:6	l a written report on the ords syntactically and se	text read. Level:6,7 emantically by contrastir	ng them with Croatian tra	nslation equivalents.	
	6.solve grammatical st them more efficiently in 7.develop language ski	ructures aimed at testing n oral communication. Lu ills in professional comm	g phrasal verbs, passive evel:6 unications and use basic	voice, modal verbs, and c business terminology. L	conditionals, and use evel:6,7	
Methods of carrying out lectures	Ex cathedra teaching Discussion	x cathedra teaching iscussion				
Methods of carrying out auditory exercises	Discussion, brainstorm Interactive problem sol Workshop	ing lving				
Course content lectures Course content auditory	1.BUILDING MATERIALS 2.PELJEAC BRIDGE, CAU 3.BRIDGES- VOCABULA 4.SUSTAINABLE BUILDI 5.TRAFFIC ROUTES - AF 6.RISK IN CIVIL ENGINE 7.EARTHQUAKE ENGINI 8.ECO-CITIES, 1h, Leari 9.RAILROADS- TEXT AN 10.MODAL VERBS, 1h, 11.TECH-SAVY YOUTHS 12.COMPANY PROFILE, 13.MOTIVATION IN WOI 14.APPLYING FOR A JOE 15.GIVING PRESENTATI 1.MATERIALS, COMPAR 2.EXPRESSING CAUSE-I 3.BRIDGES- VOCABULA 4.TEXT ANALYSIS, COM	5, KOMPARACIJA PRIDJEV JSE AND EFFECT, 1h, Lei RY, COMPOUNDS 1, 1h, NG - TEXT ANALYSIS, VC RTICLE, VOCABULARY, PH ERING, PHRASAL VERBS EERING, VOCABULARY, 1 ning outcomes:2,3,4 JALYSIS, 1h, Learning ou Learning outcomes:6 5 AND ENGINEERING, 1h, IF CLAUSES 1, 1h, Learn RKPLACE, IF CLAUSES 2, 3, WRITING A CV, 1h, Lear ISON OF ADJECTIVES, 1h EFFECT RELATIONS, VOC RY, COMPOUNDS, 1h, Learning o RINOL OGY - TRAFFIC BC	A, 1h, Learning outcome arning outcomes:2,5,6 Learning outcomes:2,5,6 CABULARY, COMPOUND IRASAL VERBS 1, 1h, Lea 2, 1h, Learning outcomes:2, h, Learning outcomes:2,4 Learning outcomes:3,7 1h, Learning outcomes:3,7 1h, Learning outcomes:1,7 omes:3,7 ABULARY- MATERIALS, 1 earning outcomes:2,5 outcomes:2,4,5 UTES. 1h, Learning outco	es:2,5,6 S 2, 1h, Learning outcom arning outcomes:2,4,6 es:2,6,7 .3 2,5,7 2,5,7 5 Lh, Learning outcomes:2, omes:2 4 6	es:2,4,5 5,6	
	6.PHRASAL VERBS, TEF 7.EARTHQUAKE ENGINI 8.FIRST PRELIMINARY E 9.TEXT ANALYSIS- RAIL 10.MODAL VERBS, 1h, 11.COMPUTER- VOCAB 12.CONDITIONAL CLAU 13.WORK- VOCABULAR 14.APPLYING FOR A JOE 15.GIVING A PRESENTA	KININOLOGY- RISK IN CIV EERING- VOCABULARY, C EXAM , 1h, Learning outc ROADS, WRITING A SUM Learning outcomes:6 ULARY, MODAL VERBS, 1 SES, 1h, Learning outcome 3, WRITING A CV, 1h, Lear XTION, DRUGI KOLOKVIJ,	LENGINEERING, 1h, Learning outco SRAMMAR- REVISION, 1h omes:2,4,5,6 MARY, 1h, Learning outco th, Learning outcomes:2 mes:3,7 s:2,7 arning outcomes:1,7 1h, Learning outcomes:3	arning outcomes:2,6,7 , Learning outcomes:2,6 comes:2,4 ,5,6		
Required materials	Basic: classroom, black Whiteboard with marke Overhead projector Video equipment	xboard, chalk ers				
Exam literature Students obligations	Basic literature: 1. English for Civil Engi Preporučena dopunska 2. Reading Technical E 2. Ilustrirani rječnik arh 2. Trojezični građevinsl Regular attendance an	neers, Špiranec, I., TVZ, literatura: nglish for Academic Purp itekture i građevinarstva ki rječnik, Prager A., 200 d being active in lesson,	Zagreb. ooses, Hercezi-Skalicki, N a, Vulelija, Z. Masmedia, 3. maximum 3 absences fi	1., Školska knjiga, Zagreb Zagreb, 2008. rom exercises and lecture), 1993. es allowed.	

Knowledge evaluation during semester	Students take two pre-exams per semester. If they pass, they are exempt from the final exam. If they fail, they are obliged to take the final exam. They also have oral examination.		
Knowledge evaluation after semester	Students take final written exam as we	ll as oral exam.	
Student activities:	Aktivnost (Oral exam) (Written exam)	ECTS 1 1	
Remark	This course can not be used for final thesis theme		
Prerequisites:	Students cannot enroll in this course unless they have completed Engleski jezik u graditeljstvu l Students cannot pass this course unless they have passed Engleski jezik u graditeljstvu l		
ISVU equivalents:	22352;143322;		

Code WEB/ISVU	23467/155976	ECTS	2.0	Academic year	2018/2019	
Name	Environmental Protecti	on		•		
Status	3rd semester - Undergr	raduate professional stud	ly in civil engineering (R	edovni graditeljstvo) - ol	oligatory course	
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + s	eminar + metodology +	construction)	15+15 (6+0+9+0) 30	
Teachers	Lectures:1. mr.sc. Gora Auditory exercises: Dej	na Ćosić-Flajsig viši pred an Kovačević dipl.ing.gra	lavač ađ.			
Course able atives	Seminar exercises: Dep	an Kovacevic dipl.ing.gra	iQ.		ata atian and avatainable.	
Course objectives	development of renewa	able resources.	icance of problems relat	ing to environmental pro	Stection and Sustainable	
Learning outcomes:	1.analyse basic depend	lencies of living commun	ities, including humans,	and their living and non	living environment.	
	Level:o 2.identify the importan 3.distinguish terms and renewable resources (a 4.identify processes of 5.analyze environment permission from the ide	 2.identify the importance of sustainable development and the role of the public in environmental processes. Level:6 3.distinguish terms and constituents of environmental protection that include nature protection, protection of non-renewable resources (air, soil and water) and space protection. Level:6 4.identify processes of resource and pollution utilization and environmental impact. Level:6 5.analyze environmental assessment procedures for plans, programs and projects, and procedures for issuing permission from the idea to the building. Level:6 				
Methods of carrying out lectures	Ex cathedra teaching Case studies Discussion Questions and answers Students are gradually environment, protectio by an overview of adm including graphic and r	i introduced into basic co n of non-renewable reso inistrative and institution photographic illustrations	ncepts of environmental urces and spatial protect al organization at local a , are used in lectures.	protection, connection o tion. Each methodologica and national levels. Mode	of nature and al unit is accompanied ern educational tools,	
Methods of carrying out auditory exercises	Group problem solving Data mining and knowl Discussion, brainstormi Mind mapping Workshop Individual thematic uni	edge discovery on the W ing ts are covered together ('eb 'task-solving and proble	m presentation).		
Methods of carrying out seminars	Group problem solving Data mining and knowl Essay writing Discussion, brainstorm	edge discovery on the W	/eb			
	Workshop Students work in group solve problems and als	is of possibly interdiscipli o acquire skills of group/	nary composition. Throu individual presentation a	igh joint work, they prac and defence of their own	tice how to define and 1 standpoints.	
Course content	1.Course plan and exar Introduction to Global E 2.Sustainable developm 3.No lessons 4.Water management, 5.Nature protection, 2h 6.No lessons 7.No lessons 8.First Colloquium, 1h, 9.No lessons 10.Climate changes, 1h Protection of the ozone 11.Waste management 12.Environmental Instr 13.No lessons 14.No lessons 15.No lessons 15.No lessons 1.No lessons	ns, 1h Ecology, 1h, Learning out nent and public participa 2h, Learning outcomes:1,2 Learning outcomes:1,2,3 h, Learning outcomes:3,4 layer and soil protection t, 2h, Learning outcomes uments, 2h, Learning out	comes:1 tion, 2h, Learning outco .,2,3,4 ,3,4 s ,5 , 1h, Learning outcomes :3,4 tcomes:3,4,5	mes:1,2 s:3,4,5		
auditory	2.No classes 3.Presentation of the cc Subdivision of seminar 4.No classes 5.No classes 6.No classes 7.Forms of seminar wor 9.No classes 10.No classes 11.No classes 12.No classes 13.No classes 14.Submission and revi 15.No classes 14.Submission and revi	oncept seminar papers, J papers with explanation, rk with examples, 2h, Lea rk with examples, 1h, Lea iew of seminar papers, 1	Lh, Learning outcomes:1 , 1h, Learning outcomes arning outcomes:1,2,3,4 arning outcomes:1,2,3,4 h, Learning outcomes:1,	,2,3,4 :1,2,3,4 ,5 ,5 2,3,4,5		
seminars	2.No classes					

	3.No classes		
	4. No classes		
	5.No classes		
	o.Presentation of the concept of the topic of seminar papers, 2n, Learning outcomes:1,2,3,4,5		
	0.NO Classes		
	3. Creating seminar papers, 21, Learning outcomes. 1,2,3,4,3		
	13 Creating seminar papers 2h Learning outcomes: 1 2 4 5		
	14.Second colloquium. 1h. Learning outcomes:2.3.4.5		
	15.Presentation of the seminar papers, 2h, Learning outcomes:1,2,3,4,5		
Required materials	Basic: classroom, blackboard, chalk		
	Whiteboard with markers		
	Overhead projector		
	Video equipment		
	Students work in groups. Through joint work, they practice how to define and solve problems and also acquire skills of		
	group/individual presentation and defence of their own standpoints.		
Exam literature	Interna skripta nastavnika kolegija Zaštita okoliša		
	Glavač,V., Uvod u globalnu ekologiju, Hrvatska sveučilisna naklada, Zagreb, 2001		
Ctudonte obligatione	A student who achieves at least 20 points of a compater during a compater has the right to go to the avery which		
Students obligations	A student who achieves at least 50 points of a senester during a senester has the right to go to the exam, which		
	The minimum purpher of points for exercising the right to attend the example.		
	The minimum number of points for exercising the right to attend the exam is 10 points from the seminar work		
Knowledge	The minimum number of points for extensing the agric of acting the examines for points while the		
evaluation during	buting the senester, through conclude and seminar work, the student can achieve a maximum of ob points while the		
semester	arade is released from the written part of the final exam		
	During the semester there are 2 regular colloguia and 1 correctional colloguium. The total of both rounds can be 2×21		
	= 42 points. A student can only fix one colloquium.		
	Minimum 15 points (minimum 70%) from the colloquium is to release the exam on the written part of the exam.		
	Students create seminar work in groups of 4-5 students on practical examples and topics related to the course content		
	of Environmental Protection. Seminar work is presented in groups and brings max. 18 points, and for the exemption of		
	the written part of the exam is 14 points.		
Knowledge			
evaluation after	The exam is submitted as an oral and written part of the exam. An essential requirement for oral exam is the		
semester	achievement of 50% and more success on the written part.		
	The mail grade of the subject is the sum of the marks obtained during the semester and the exam as a percentage of		
	$S0 - S0 - \text{vert}(n \circ 0)$		
	65 - 79 - 6000		
	50 - 64.9 - sufficient (2)		
Student activities:	Aktivnost ECTS		
	(Constantly tested knowledge) 1		
	(Oral exam) 1		
Remark	This course can not be used for final thesis theme		
Prerequisites:	Students cannot pass this course unless they have passed Osnove geologije		
	Students cannot enroll in this course unless they have passed Matematika I		
	Students cannot enroll in this course unless they have enrolled Osnove geologije		
	22250		
Drepoorland to be	2233U; Carran Ćasić Elalian MCa. Carlar lasturar 22.06.2010		
Proposal made by	Gorana Cosic Fiajisg, MSc, Senior lecturer, 23.06.2018.		

Code WEB/ISVU	22883/22359	ECTS	2.0	Academic year	2018/2019	
Name	Field Practice			-	-	
Status	4th semester - Undergr	aduate professional stud	dy in civil engineering (R	edovni graditeljstvo) - o	bligatory course	
Teaching mode	Lectures + exercises (a	uditory + laboratory + s	seminar + metodology +	construction)	0+30 (30+0+0+0) 30	
Teachers	Auditory exercises:1. v.	predavač Boris Uremov	ić dipl.ing.građ.			
	Auditory exercises: Zdr	avko Muratti				
	Auditory exercises: Nin	a Šantek struč.spec.ing.	aedif., predavač			
	Auditory exercises: Dor	nagoj Šojat struč.spec.ir	ng.aedif.			
-	Auditory exercises: San	ela Vojnović mag.ing.ae	edif			
Course objectives	Students will acquire so relating to the realization	ome basic practical know on of work and production	vledge about various tecl on of on-site documents.	hnological and organizat	tional procedures	
Learning outcomes:	1.draw a basic schemat	ic diagram of site organ	isation. Level:6			
	2.draw a basic schemat	ic of production plant. L	evel:6		a vali C	
	A analyse the use of ma	construction, finishing a	ion site Level 6	a construction project. L	evel:0	
	5.manage construction	site documentation. Lev	/el:6.7			
	6.analyse transport solu	utions during construction	on process. Level:6			
	7.differentiate on-site p	rotection measures. Lev	vel:6			
Methods of carrying out auditory exercises	Students will be prepar	ed for participation in si	te work and for solving p	ractical problems on the	construction site.	
Course content	1.Preparations for field	practice, learning how t	o prepare site diary, exa	mples from real constru	ction sites., 2h, Learning	
auditory	outcomes:1,2					
	2.Preparations for field	Preparations for field practice, learning how to prepare site diary, examples from real construction sites., 2h, Learning subsequent 2				
	outcomes: 1,2					
	3.Preparations for field practice, learning now to prepare site diary, examples from real construction sites., 2n, Learnin outcomes:1.2					
	4. Prenarations for field practice, learning how to prepare site diary, examples from real construction sites. 2h. Learni					
	outcomes:1,2					
	5.Preparations for field practice, learning how to prepare site diary, examples from real construction sites., 2h, Learnin					
	outcomes:3,4					
	6.Preparations for field	practice, learning how t	o prepare site diary, exa	mples from real constru	ction sites., 2h, Learning	
	7 Preparations for field	practice learning how t	o prepare site diary exa	moles from real constru	ction sites 2h Learning	
	outcomes:3.4	practice, learning now t	o prepare site diary, exa	inples nom real constru	ction sites., zn, ceaning	
	8.Preparations for field	practice, learning how t	o prepare site diary, exa	mples from real constru	ction sites., 2h, Learning	
	outcomes:3,4					
	9.Preparations for field	practice, learning how t	o prepare site diary, exa	mples from real constru	ction sites., 2h, Learning	
	0utcomes:5,0	h practice learning how	to prepare site diary ex	amples from real constr	uction sites 2h	
	Learning outcomes:5,6	a practice, rearning non	to prepare site diary, ex			
	11.Preparations for field	d practice, learning how	to prepare site diary, ex	amples from real constr	uction sites., 2h,	
	12.Preparations for field	d practice, learning how	to prepare site diary, ex	amples from real constr	uction sites., 2h,	
	Learning outcomes:5,6 13.Preparations for field	d practice, learning how	to prepare site diary, ex	amples from real constr	uction sites., 2h,	
	Learning outcomes:5,6,	7 h practice learning how	to prepare site diary ex	amples from real constr	uction sites 2h	
	Learning outcomes:6,7	a practice, rearring non			uotion oncosi, 211,	
	15.Preparations for field	d practice, learning how	to prepare site diary, ex	amples from real constr	uction sites., 2h,	
	Learning outcomes:6,7					
Required materials	Basic: classroom, black	board, chalk				
Exam literature	Basic literature:					
	Additional literature:					
	 J. Klepac: Organizacij 	a građenja-uređenje gra	adilište, Sveučilište u Zag	rebu, Građevinski fakuli	.et, 1982.	
	2. J. Marušić: Organizac	ija građenja, Sveučilište	u Zagrebu, 1994.			
	3. G. Bućar: Tesarski, a	rmirački i betonski rado	vi na gradilištu, Građevin	ski fakultet J.J. Strossma	iyera u Osijeku	
Students obligations	maximum of 3 absence	s from exercises				
Knowledge	Redovitost ponaa#1#0	#100\$Seminarski rad#.	1#100#50\$			
semester						
Knowledge	The field practice is an	organized practical worl	<pre>< for which students are </pre>	prepared during auditor	y exercises. After	
evaluation after	completion of field prac	tice, students are consid	dered able to actively pa	rticipate in on site activi	ities.	
semester	The second part of field	practice is conducted a	s professional practical v	work forming part of fina	I assignment.	
Student activities:	Aktivnost		ECTS			
	(Seminar Work)		2			
Kemark	Inis course can not be	used for final thesis the	me			
Prerequisites:	No prerequisites.		2010			
Proposal made by	v.predavač Boris Uremo	ović dipl.ing.građ., 17.9.	2018			

Code WEB/ISVU	23471/155981	ECTS	12.0	Academic year	2018/2019
Name	Final Thesis with Field P	ractice			
Status	6th semester - Civil and	Environmental Engineer	ring (Redovni graditeljstv	vo) - elective course	
Teaching mode	Lectures + exercises (a work at home	uditory + laboratory + se	eminar + metodology +	construction)	240+0 (0+0+0+0) 120
Teachers	Lectures:1. Jagoda Bodi	ć dipl.ing.arh.			
Course objectives	Use of acquired knowled	dge for independent real	ization of practical engir	neering tasks	
Learning outcomes:	1.identify problem or de	evelopment areas. Level:	6	•	
-	2.analyse achievements	s made in this area. Leve	el:6		
	3.break down problem a	areas or development are	eas into individual comp	onents. Level:6	
	4.develop a proposal or	solution for a problemat	ic situation. Level:6,7		
	5.develop a practical so	lution to a problem. Leve	el:6,/ r the final namer I evolut	- 7	
	7 procept work results	l avalis 7	r the final paper. Levels),/	
Methods of carrying	Ex cathedra teaching				
out lectures					
Course content	1.As agreed with the tu	tor (mentor). 16h. Learni	ng outcomes:1.2.3.4.5.6	5.7	
lectures	2.As agreed with the tu	tor (mentor), 16h, Learni	ng outcomes:1,2,3,4,5,6	, 5,7	
	3.As agreed with the tutor (mentor), 16h, Learning outcomes:1,2,3,4,5,6,7				
	4.As agreed with the tutor (mentor), 16h, Learning outcomes:1,2,3,4,5,6,7				
	5.As agreed with the tutor (mentor), 16h, Learning outcomes:1,2,3,4,5,6,7				
	o.As agreed with the tutor (mentor), 1on, Learning outcomes:1,2,3,4,3,6,7				
	7.As agreed with the tubi (mentor), 160, Learning outcomes: $1,2,3,4,5,6,7$				
	α As agreed with the tubit (mentor), 160, Learning outcomes: 1,2,3,4,5,6,7				
	3.83 agreed with the tutor (mentor) 160, Learning outcomes: $1,2,3,7,5,7$				
	11.As agreed with the t	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5,	,6,7	
	12.As agreed with the to	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5	,6,7	
	13.As agreed with the t	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5,	,6,7	
	14.As agreed with the to	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5,	,6,7	
	15.As agreed with the ti	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5	,6,7	
Required materials	Special equipment				
Exam literature	U dogovoru s mentorom	ı			
Students obligations	maximum of 3 absences	s from exercises			
Knowledge	Prakti ispit#1#100#100)\$			
evaluation during					
semester					
Knowledge	Practical exam				
evaluation after					
Student activities:	Aktivnost		FCTS		
Student activities.	(Written exam)		6		
	(Oral exam)		6		
Remark	This course can not be u	used for final thesis them	ne		
Prereguisites:	Students cannot enroll i	n this course unless they	/ have passed Hidrologij	a i hidraulika	
	Students cannot enroll i	n this course unless they	/ have completed Gospo	darenje otpadom	
	Students cannot enroll in this course unless they have completed Korištenje voda				
	Students cannot enroll in this course unless they have completed Zaštita voda				
	Students cannot enroll i	n this course unless they	/ have completed Osnov	e żeljeznica	
	Students cannot enroll i	n this course unless they	nave completed Kakvo	ca voda	
ISVII equivalanta	22288,20175,20176.65	150-65305-147437-1474	30.1/7//0.1/7//1.100	070-155020-155002-	
isvo equivalents:	52200'2AT12'2AT10'02	1,14/45/;14/4	.59,14/440,14/441;155	212,102800,102802;	

Code WEB/ISVU	23472/155982	ECTS	12.0	Academic year	2018/2019	
Name	inal Thesis with Field Practice					
Status	6th semester - Building	Construction (Redovni gi	raditeljstvo) - elective co	ourse		
Teaching mode	Lectures + exercises (au work at home	uditory + laboratory + se	eminar + metodology +	construction)	240+0 (0+0+0+0) 120	
Teachers	Lectures: 1. Jagoda Bodio	ć dipl.ing.arh.			•	
Course objectives	Use of acquired knowled	lge for independent reali	ization of practical engir	neering tasks		
Learning outcomes:	1.identify problem or de	velopment areas. Level:	6	J		
jj	2.analyse achievements	made in this area. Leve	1:6			
	3.break down problem a	areas or development are	eas into individual comp	onents. Level:6		
	4.develop a proposal or	solution for a problemat	ic situation. Level:6,7			
	5.develop a practical so	develop a practical solution to a problem. Level.6,7				
	Judenine infits and generalization possibilities for the final paper. Level:6,7					
	7.present work results. I	Level:6,7				
Methods of carrying	Ex cathodra toaching					
out lectures						
Course content	1.As agreed with the tut	or (mentor), 16h, Learni	ng outcomes:1.2.3.4.5.6	5.7		
lectures	2.As agreed with the tut	or (mentor), 16h, Learni	ng outcomes:1,2,3,4,5,6	, ,7		
	3.As agreed with the tutor (mentor), 16h, Learning outcomes:1,2,3,4,5,6,7					
	4.As agreed with the tutor (mentor), 16h, Learning outcomes:1,2,3,4,5,6,7					
	5.As agreed with the tutor (mentor), 16h, Learning outcomes:1,2,3,4,5,6,7					
	0.85 agreed with the tutor (mentor), 161, Learning outcomes:1,2,3,4,3,6,7					
	As agreed with the tutor (mental), 160, Learning outcomes:1,2,3,4,5,0,7					
	9. As agreed with the tutor (mentor), 16h, Learning outcomes:1,2,3,4,5,6,7					
	10. As agreed with the tutor (mentor), 160, Learning outcomes: 1,2,3,4,5,6,7					
	11.As agreed with the tu	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5,	.6,7		
	12.As agreed with the tu	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5,	,6,7		
	13.As agreed with the tu	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5,	,6,7		
	14.As agreed with the tu	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5,	,6,7		
	15.As agreed with the ti	utor (mentor), 16n, Learr	ing outcomes:1,2,3,4,5,	,0,7		
Required materials	Special equipment					
Exam literature	U dogovoru s mentorom	1				
Students obligations	maximum of 3 absences	s from exercises				
Knowledge	Prakti ispit#1#100#100)\$				
evaluation during						
semester						
Knowledge	Practical exam					
evaluation after						
semester Student octivitien			FOTO			
Student activities:	AKTIVNOST ECTS					
	(Oral exam)		6			
Remark	This course can not be i	used for final thesis them				
Prereguisites:	Students cannot enroll i	n this course unless they	have nassed Betonske	konstrukcije II		
r rerequisites.	Students cannot enroll i	n this course unless they	have completed Zgrad	arstvo l		
	Students cannot enroll in this course unless they have completed Instalacile zarada I					
	Students cannot enroll in this course unless they have completed Završni radovi					
	Students cannot enroll i	n this course unless they	v have completed Monta	žne građevine		
	Students cannot enroll i	n this course unless they	have completed Osnov	e željeznica		
ISVII equivalents:	22388-30175-30176-65	150.65305.147437.1474	30.1/7//0.1/7//1.1550	070.155080.155081.		
is vo equivalents:	22,00,156,0116,00,023	1,14/4	55,147440,147441,155	,10,5,10,00,10,301,		

Code WEB/ISVU	23470/155980	ECTS	12.0	Academic year	2018/2019
Name	inal Thesis with Field Practice				
Status	6th semester - Civil Engi	ineering (Water and traf	fic infrastructure) (Redo	vni graditeljstvo) - elect	ive course
Teaching mode	Lectures + exercises (au work at home	uditory + laboratory + se	eminar + metodology +	construction)	240+0 (0+0+0+0) 120
Teachers	Lectures:1. Jagoda Bodid	ć dipl.ing.arh.			
Course objectives	Use of acquired knowled	dge for independent real	ization of practical engir	neering tasks	
Learning outcomes:	1.identify problem or de	velopment areas. Level:	6	•	
-	2.analyse achievements	made in this area. Leve	1:6		
	3.break down problem a	areas or development are	eas into individual comp	onents. Level:6	
	4.develop a proposal or	solution for a problemat	ic situation. Level:6,7		
	5.develop a practical sol	lution to a problem. Leve	el:6,7 r the final namer 1 avel:6	- 7	
	7 procept work results	eralization possibilities to	r the final paper. Level:), /	
	7.present work results. I	Level.0,7			
Methods of carrying	Ex cathedra teaching				
out lectures					
Course content	1.As agreed with the tut	or (mentor), 16h, Learni	ng outcomes:1,2,3,4,5,6	i,7	
lectures	2.As agreed with the tut	or (mentor), 16h, Learni	ng outcomes:1,2,3,4,5,6	5,7	
	3.As agreed with the tut	or (mentor), 16h, Learni	ng outcomes:1,2,3,4,5,6	5,7	
	4.As agreed with the tut	or (mentor), 16h, Learni	ng outcomes:1,2,3,4,5,6	5,7	
	5.As agreed with the tut	for (mentor), 16h, Learni	ng outcomes:1,2,3,4,5,6),/ : 7	
	7 As agreed with the tut	or (mentor), 16h Learni	ng outcomes:1,2,3,4,3,0	5,7	
	8.As acreed with the tutor (mentor), 16h, Learning outcomes:1,2,3,4,5,6,7				
	9.As agreed with the tutor (mentor), 16h, Learning outcomes:1,2,3,4,5,6,7				
	10.As agreed with the tutor (mentor), 16h, Learning outcomes:1,2,3,4,5,6,7				
	11.As agreed with the tu	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5,	,6,7	
	12.As agreed with the tu	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5	,6,7	
	13.As agreed with the tu	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5,	,6,7	
	14.As agreed with the tu	utor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5,	,6,7 67	
	13.As agreed with the tt	itor (mentor), 101, Lean	ing outcomes.1,2,3,4,3	,0,7	
Required materials	Special equipment				
Exam literature	U dogovoru s mentorom]			
Students obligations	maximum of 3 absences	s from exercises			
Knowledge	Prakti ispit#1#100#100)\$			
evaluation during					
semester					
Knowledge	Practical exam				
semester					
Student activities	Aktivnost		FCTS		
	(Written exam)		6		
	(Oral exam)		6		
Remark	This course can not be u	used for final thesis them	ne		
Prerequisites:	Students cannot enroll i	n this course unless they	v have passed Hidrologij	a i hidraulika	
	Students cannot enroll i	n this course unless they	have completed Osnov	e željeznica	
	Students cannot enroll in this course unless they have completed Ceste II				
	Students cannot enroll in	n this course unless they	/ have completed Regula	acije i melioracije	
	Students cannot enroll II	n this course unless they	have completed Upskri	ua vodom i odvodnja i	
	Students cannot enroll li	in this course unless they	nave completed Vodno	gospodarske gradevine	
ISVU equivalents:	22388;39175;39176:651	159;65395;147437;1474	39;147440;147441;155	979;155981;155982:	
	,			,	

Code WEB/ISVU	23469/155979	ECTS	12.0	Academic year	2018/2019
Name	inal Thesis with Field Practice				
Status	6th semester - Managem	nent in Civil Engineering	(Redovni graditeljstvo)	- elective course	
Teaching mode	Lectures + exercises (au	iditory + laboratory + se	eminar + metodology +	construction)	240+0(0+0+0+0)
· · · · · · · · · · · · · · · · · · ·	work at home			,	120
Teachers					-
Course objectives	Use of acquired knowled	ge for independent reali	zation of practical engin	peering tasks	
Learning outcomes:	1 identify problem or de	velopment areas. Level:	6		
Learning baccomes.	2 analyse achievements	made in this area. Level	0 I•6		
	3.break down problem a	reas or development are	eas into individual comp	onents. Level:6	
	4.develop a proposal or	solution for a problemati	ic situation. Level:6,7		
	5.develop a practical sol	ution to a problem. Leve	el:6,7		
	6.define limits and gene	ralization possibilities for	r the final paper. Level:6	5,7	
	7.present work results. L	evel:6,7			
Methods of carrying	Ex cathedra teaching				
out lectures					
Course content	1.As agreed with the tut	or (mentor), 16h, Learnii	ng outcomes:1,2,3,4,5,6	5,7	
lectures	2.As agreed with the tute	or (mentor), 16h, Learnii	ng outcomes:1,2,3,4,5,6	5,7	
	3.As agreed with the tut	or (mentor), 16h, Learnii	ng outcomes:1,2,3,4,5,6	5,7	
	4.As agreed with the tut	or (mentor), 16h, Learnii	ng outcomes:1,2,3,4,5,6	o, /	
	5.As agreed with the tut	or (mentor), 16h, Learni	ng outcomes:1,2,3,4,5,6),/ · -	
	0. As agreed with the tubit (mentor), 10th Learning outcomes. 1,2,3,4,5,0,7				
	8 As agreed with the tut	or (mentor), 16h Learni	ng outcomes $1, 2, 3, 4, 5, 6$	5,7	
	9 As agreed with the tutor (mentor), 16t, Learning outcomes: 12,34,56,7				
	5.As agreed with the tub (mentor), 10h, Learning outcomes. 1, 2, 3, 5, 5, 7				
	11.As agreed with the tu	tor (mentor), 16h, Learr	ning outcomes:1,2,3,4,5	.6.7	
	12.As agreed with the tu	itor (mentor), 16h, Learn	ning outcomes:1,2,3,4,5	,6,7	
	13.As agreed with the tu	tor (mentor), 16h, Learn	ning outcomes:1,2,3,4,5	,6,7	
	14.As agreed with the tu	tor (mentor), 16h, Learn	ing outcomes:1,2,3,4,5,	,6,7	
	15.As agreed with the tu	tor (mentor), 16h, Learn	ning outcomes:1,2,3,4,5,	,6,7	
Required materials	Video equipment				
	Maquette				
Exam literature	U dogovoru s mentorom				
Students obligations	maximum of 3 absences	from exercises			
Knowledge	Prakti ispit#1#100#100	\$			
evaluation during					
semester	D 11 1				
Knowledge	Practical exam				
evaluation after					
Semester Student setivities			ГСТС		
Student activities:			ECIS		
	(Written exam)		6		
Dements		and four final the said the sur	0		
Remark	This course can not be u	sed for final thesis them			
Prerequisites:	Students cannot enroll in	this course unless they	have passed Trziste Tp	izacija gradiličta	
	Students cannot enroll in	this course unless they	have completed Urgan	izacija gradilista	u graditalistvu
	Students cannot enroll in	this course unless they		vanje tvrtke	graditeljstvu
	Students cannot enroll in	this course unless they	have completed Regula	ativa i vođenie projekat	a
	Students cannot enroll in	this course unless they	have completed Osnov	e želieznica	~
ISVU equivalents:	22388;39175;39176;651	.59;65395;147437;1474	39;147440;147441;155	980;155981;155982;	

Code WEB/ISVU	23473/155983	ECTS	5.0	Academic year	2018/2019
Name	Finishing Works				
Status	5th semester - Building	Construction (Redovni g	graditeljstvo) - obligatory	course	
Teaching mode	Lectures + exercises (a	uditory + laboratory + s	eminar + metodology +	construction)	30+30 (6+0+0+24) 90
Teachers	Lectures:1. Sania Lađar	pertures: 1 Sania Lađarević dini ing arb			
	Lectures:2. dr.sc. Draže	ectures:2. dr.sc. Dražen Arbutina dipl.ing.arh.			
	Auditory exercises: Gor	Auditory exercises: Goran Babić			
	Lonstruction exercises: Goran Babic				
Course objectives	Students will acquire kr materials, their utilisatio	Students will acquire knowledge about finishing works regarded as a phase in building construction, and also about materials, their utilisation and placement/installation techniques			
Learning outcomes:	1.comment on boundar	1.comment on boundary structures taken as a part of the complex system of vertical and horizontal parts of the			
	building. Level:6				
	2.identify external and	internal physical influence	ces as determinants in se	electing the structure ar	nd materials during
	Tormation of boundary s	structure layers. Level:6	s as a part of total solutio	one for boundary structu	re of the building and
	the use of appropriate r	materials in structural pa	arts of the building. Leve	1:6	ine of the building, and
	4.draw structural solution	on details for multi-layer	ed walls. Level:6		
	5.differentiate ways for	closing openings depen	ding on the type of mate	erial and construction me	ethod. Level:6
	o.uraw uoor and window details. Levelto 7 propose an appropriate building protection against precipitation involving an appropriate roof covering and				
	evacuation of water by	sheet metal elements, w	with graphical presentation	on of the solution. Level:	:6,7
	8.draw floor and ceiling	lining details using diffe	erent materials based on	appropriate functional a	and aesthetic
	requirements. Level:6				
	Established to the set of the set				
methods of carrying	Ex catheora teaching Case studies				
	Other				
	Finishing works for buildings, as well as materials, application and placement methods, are explained and illustrated by				
	urawings or elements and details. To facilitate comprenension, students are required to make their own drawings during the lectures				
Methods of carrying	Group problem solving				
out auditory	Other				
exercises	Instructions for prepara	tion of the graphical ass	ignment		
How construction	Group problem solving				
exercises are held	Discussion, brainstorming				
	Other Preparation of graphics	al assignments with corr	ections and assistance fr	om the lecturer	
Course content	1.Introduction. notion of	f finishing works as a ph	ase in building construct	ion. 2h. Learning outcor	nes:6
lectures	2.Boundary structures/e	elements as a part of a c	complex system of vertic	al and horizontal parts o	f a building. , 2h,
	Learning outcomes:6				-
	3.Physical factors influe	ncing formation of struc	tural layers , 2h, Learnin	g outcomes:6	
	4. External and internal requirements as a part	of total solution to bound	dary system of a building	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	es.6
	5.Use of appropriate ma	aterials at structural port	tions of a building , 2h, L	earning outcomes:6	
	6. Multilayer walls, deta	ils of structural solutions	s, 2h, Learning outcomes	5:6	
	7. Multilayer walls, deta 8. Multilayer walls, deta	ills of structural solutions	s, 2h, Learning outcomes	5:6	
	9. Closing openings: with	h wood, plastics, steel, a	luminium: window and d	loor details. 2h. Learning	a outcomes:6
	10.Closing openings: with wood, plastics, steel, aluminium; window and door details, 2h, Learning outcomes:6				ng outcomes:6
	11.Building protection a	igainst atmospheric influ	ences - roof covering wo	ork, details of roof cover	made of modern
	materials, water evacua	ation with steel sheet ele	ements, 2h, Learning out	comes:6 ork_dotails_of_roof_covor	made of modern
	12. Building protection against atmospheric inductes - too covering work, details of too cover made of modern materials, water evacuation with steel sheet elements. 2h Learning outcomes:6				
	13. Floors - selection of materials and details , 2h, Learning outcomes:6				
	14. Floors - selection of	materials and details , 1	Ih, Learning outcomes:6		
	Lining for ceilings - materials and details , 1h, Learning outcomes:6				
	101211111g 101 001111g0 1		, Leanning cateonicolo		
Course content	1.Instructions for the pr	eparation and presentat	ion of graphical assignm	ents or seminar papers,	2h, Learning
auditory	outcomes:6	concretion and presentet	ion of graphical accignm	ante er cominar nanare	1h Loorning
	outcomes:6	eparation and presentat	lion of graphical assignin	lents of seminal papers,	III, Leanning
	3.Instructions for the preparation and presentation of graphical assignments or seminar papers, 1h, Learning				
	outcomes:6	concretion and procentet	ion of graphical accignm	ante er cominer nenere	1h Loorning
	4.Instructions for the pr	eparation and presentat	ion of graphical assignm	ents or seminar papers,	In, Learning
	5.Instructions for the pr	eparation and presentat	ion of graphical assignm	ents or seminar papers,	1h, Learning
	outcomes:6 6				
	/ 8				
	9				
	10				
	11				
	13				
I	I ***				

	14 15
Course content constructures	 1 2.Students individually solve complex building details , 1h, Learning outcomes:6 3.Students individually solve complex building details , 1h, Learning outcomes:6 4.Students individually solve complex building details , 1h, Learning outcomes:6 5.Students individually solve complex building details , 1h, Learning outcomes:6 6.Students individually solve complex building details , 2h, Learning outcomes:6 7.Students individually solve complex building details , 2h, Learning outcomes:6 8.Students individually solve complex building details , 2h, Learning outcomes:6 9.Students individually solve complex building details , 2h, Learning outcomes:6 10.Students individually solve complex building details , 2h, Learning outcomes:6 11.Students individually solve complex building details , 2h, Learning outcomes:6 12.Students individually solve complex building details , 2h, Learning outcomes:6 13.Students individually solve complex building details , 2h, Learning outcomes:6 13.Students individually solve complex building details , 2h, Learning outcomes:6 14.Students individually solve complex building details , 2h, Learning outcomes:6 15.Students individually solve complex building details , 2h, Learning outcomes:6 13.Students individually solve complex building details , 2h, Learning outcomes:6 14.Students individually solve complex building details , 2h, Learning outcomes:6 15.Students individually solve complex building details , 2h, Learning outcomes:6 15.Students individually solve complex building details , 2h, Learning outcomes:6 15.Students individually solve complex building details , 2h, Learning outcomes:6
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Overhead projector Video equipment
Exam literature	Basic literature: 1. M.Smoljanović: Separati predavanja, crteži detalja 2. ?. Peulić: Konstruktivni elementi zgrada I i II, Tehnička knjiga, Zagreb, 1980.(odabrana poglavlja) Additional literature: 1. Heinrich Schmitt: Hochbaukonstruktion4. Martin Mittag: Građevinske konstrukcije 2. Prospekti proizvođača pojedinih suvremenih materijala
Students obligations	maximum of 3 absences from exercises
Knowledge evaluation during semester	Assignments: assignment submittal required for second signature.
Knowledge evaluation after semester	Examination (written and oral): in the scope of the written part of the examination, students are required to make a graphical representation relating to the course; comprehension of the topics presented during the course are verified during the oral examination.
Student activities:	Aktivnost ECTS (Classes attendance) 1 (Project) 2 (Constantly tested knowledge) 1 (Written exam) 1
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have passed Građevinski materijali Students cannot enroll in this course unless they have passed Elementi zgrada II Students cannot enroll in this course unless they have passed Matematika II Students cannot enroll in this course unless they have completed Betonske konstrukcije II
ISVU equivalents:	22386;

Study programme	for academic year	2018/2019
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Code WEB/ISVU	23436/155933	ECTS	2.0	Academic year	2018/2019	
Name	Geodesy					
Status	3rd semester - Undergi	raduate professional stud	dy in civil engineering (R	edovni graditeljstvo) - ol	oligatory course	
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + s	eminar + metodology +	construction)	15+15 (8+0+0+7) 30	
Teachers	Lectures:1. prof. dr. sc. Đuro Barković dip. ing. geod. Auditory exercises:prof. dr. sc. Đuro Barković dip. ing. geod. Construction exercises:prof. dr. sc. Đuro Barković dip. ing. geod.					
Course objectives	Students will acquire so	ome fundamental knowle	edge on geodesy as a pro	ofession, as well as some	e basic knowledge on	
Learning outcomes:	define land survey as	tivities that are most off	neering.	ing Lovel:6		
Leanning outcomes.	 2.select most favourable land survey methods needed to conduct simple land survey activities in civil engineering. Level:7 3.select land survey instruments and accessories for simple geodetic measurements. Level:7 4.use theodolite to measure angles, level to measure differences in height, and measuring tapes for direct measurement of lengths. Level: 5.explain geodetic networks. Level:6,7 6.calculate coordinates and elevations of points, and calculate lengths, angles and areas based on known coordinates of points. Level:6 					
	7.use topographic surv	7.use topographic survey plans and maps as a basis for design work. Level:				
	8.present GIS in geode 9.calculate angles and 10.define legal procedu 11.propose systems for	sy. Level:6,7 area of a figure based or ure for construction of ob r displacements and defo	n defined coordinates. Le jects. Level:6,7 prmations measurement:	evel:6 s . Level:6,7		
Methods of carrying out lectures	Lectures are given oral of notebook computer of students in order to	ly, with simultaneous wr and projector. During the provoke them to make c	iting and drawing on the e lectures, the lecturer as onclusions in the way the	blackboard. Presentatio sks questions and requir ey will be required to do	ns are given by means es active participation in their practical work.	
Methods of carrying out auditory exercises	Group problem solving					
How construction exercises are held	Students perform meas	surements both individua	ally and in teams.			
Course content	1.History and future of	geodesy. Classification of	of geodesy, 1h, Learning	outcomes:1		
lectures	2.Geodetic measureme 3.Measurement uncert. 4.Coordinate systems a 5.Geodetic networks , 6.Geodetic measureme 7.Satellite positioning , 8.1. kolokvij, 1h, Learn 9.Geodetic registers, p 10.Geoinformation syst 11.Application of geod 22.Legal procedure for 13.Determination of ar 14.Measuring displacer 15.2. kolokvij, 1h, Lear	ents and instruments , 1h ainty and adjustments , 1 and coordinate types , 1h 1h, Learning outcomes:5 ent of land , 1h, Learning 1h, Learning outcomes:1,2,3,4,5,6 lans and maps , 1h, Lear tems and E-service, 1h, L easy in civil engineering , construction of objects, eas and ground masses , ment and deformation of ning outcomes:7,8,9,10,1	a, Learning outcomes:2 Ih, Learning outcomes:3 a, Learning outcomes:4,6 outcomes:5,6,7 5,6 ,7 ning outcomes:7 .earning outcomes:8 Ih, Learning outcomes:9 Ih, Learning outcomes:2 civil engineering structu 11	5,7 0,10 .0 9 ıres , 1h, Learning outco	mes:11	
Course content auditory	1.introduction to maps 2.calculating distances 3.calculating distances 4.solving various triang 6.calculate the height of 7.calculate the height of 8.1. kolokvij, 1h, Learn 9.introduction to surve 10.introduction to level 11.determine the volur 12.determine the volur 13.presentation of geo 14.prezentacija rada ge	and plans, 1h, Learning and angles from the coo and angles from the coo gles, 1h, Learning outcom gles, 1h, Learning outcom of points, 1h, Learning ou of points, 1h, Learning ou ing outcomes:1,2,3,4,5,6 ying instruments, 1h, Lear instrument, 1h, Learnin- ne of earthworks, 1h, Lear ne of earthworks, 1h, Lear robot, GNSS and laser sc eorobota, GNSS i lasersk ning outcomes:7,8,9,10,7	outcomes:1 prdinates, 1h, Learning o prdinates, 1h, Learning o hes:2,3,5,7 htcomes:2,3 htcomes:2,3 htcomes:2,3 htcomes:2,3 htcomes:8,9 g outcomes:8,9 g outcomes:8,9 arning outcomes:8,9 arning outcomes:8,9 anner, 1h, Learning outco og skenera, 1h, Learning https://www.skenera.1h, Learning https://wwwww.skenera.1h, Learning https	utcomes:6 utcomes:4,6 omes:10,11 outcomes:10,11		
Course content constructures	1.introduction to maps 2.calculating distances 3.calculating distances 4.solving various triang 6.solving various triang 6.calculate the height of 7.calculate the height of 8.1. kolokvij, 1h, Learn 9.introduction to surve 10.introduction to leve 11.determine the volur 12.determine the volur	and plans, 1h, Learning and angles from the coo and angles from the coo les, 1h, Learning outcom gles, 1h, Learning outcom of points, 1h, Learning ou of points, 1h, Learning ou ing outcomes:1,2,3,4,5,6 ying instruments, 1h, Learning ne of earthworks, 1h, Learning ne of earthworks, 1h, Learning ne of earthworks, 1h, Learning	outcomes:1 ordinates, 1h, Learning o ordinates, 1h, Learning o nes:2,3,5,7 nes:2,3,5,7 itcomes:2,3 itcomes:2,3 i,7 arning outcomes:8,9 arning outcomes:8,9 arning outcomes:8,9 arning outcomes:8,9	utcomes:6 utcomes:4,6		

	13.presentation of georobot, GNSS and laser scanner, 1h, Learning outcomes:10,11 14.presentation of georobot, GNSS and laser scanner, 1h, Learning outcomes:10,11 15.2. kolokvij, 1h, Learning outcomes:7,8,9,10,11		
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Overhead projector Video equipment		
Exam literature	Basic literature: 1. Kapović, Z. (2010): Geodezija u niskogradnji, Geodetski fakultet, Sveučilišta u Zagrebu. 2. Pribičević, B. i Medak, D. (2003): Geodezija u građevinarstvu, V.B.Z. d.o.o. Zagreb. 3. Macarol, S. (1978): Praktična geodezija. Školska knjiga, Zagreb. (str.: 11-20, 26-28, 38-67, 194-201, 619-624) Additional literature: 1.Benčić, D. (2008): Mjerni instrumenti i sustavi u geodeziji i geoinformatici. Školska knjiga, Zagreb.		
Students obligations	presence at lectures		
Knowledge evaluation during semester	Redovitost pohaa#10#0#50\$Kolokvij, numeri zadaci#2#50#50\$Programski zadatak#2#100#0\$		
Knowledge	Assignments: 2 assignments must be completed to obtain lecturer's second signature (1. cartography, 2. practical		
evaluation after	geodesy)		
semester	Examination: The examination is twofold (written and oral). The written part of the examination consists of five problems. Knowledge from fields defined in the program of studies is tested during the oral part of the examination.		
Student activities:	AktivnostECTS(Classes attendance)2		
Remark	This course can not be used for final thesis theme		
Prerequisites:	Students cannot enroll in this course unless they have passed Matematika I		
ISVU equivalents:	22354;		
Proposal made by	prof. dr. sc. Zdravko Kapović		

Code WEB/ISVU	23437/155934	ECTS	5.0	Academic year	2018/2019	
Name	Geotechnical Engine	ering	•		•	
Status	4th semester - Unde	rgraduate profe	ssional study in civil engineering	g (Redovni graditeljstvo) -	obligatory course	
Teaching mode	Lectures + exercises	auditory + lat	poratory + seminar + metodolog	gy + construction)	30+30 (10+0+4+16)	
	work at home				90	
Teachers	Lectures:1. mr.sc. Že	eljko Lebo v. pre	ed.			
	Lectures:2. dr.sc. Sol	nja Zlatovic , pr vana Pavlić	ofesor visoke skole			
	Seminar exercises: IN	vana Pavlić				
	Construction exercise	es: Ivana Pavlić				
Course objectives	Students will be edue	cated to recogn	ise geotechnical problems in civ	vil engineering practice, w	hich will enable them to	
	ndependently solve urgent on-site problems and a number of not highly complex geotechnical problems, and also to					
	communicate with geotechnical engineers and other experts participating in geotechnical investigations or in construction work involving geotechnical expertise.					
Loorning outcomoci	1 octimate cottlemer	t and load boa	ring capacity of soil under found	lations for given parameter	arc of a borizontally	
Learning outcomes:	stratified soil. Level:	5.7	This capacity of soil under found	acions for given paramete	ers of a nonzontally	
	2.design foundations	of a simple str	ucture. Level:6,7			
	3.calculate actions on a freestanding retaining wall. Level:6					
	4.check stability of a freestanding retaining wall. Level:6					
	5.design a freestand	ing wall. Level: is on different r	o,7 etaining structures Level:6			
	7.differentiate found	ation pit protec	tion methods, possible hazards,	necessary verifications. L	evel:6	
	8.differentiate soil im	nprovement pro	cedures. Level:6			
	9.check potential da	nger of hydraul	ic failure ant the foundation pit I	pottom, and protect pit ag	ainst such danger. Level:6	
Methods of carrying	Ex cathedra teaching)				
outliectures	Case studies					
	Demonstration					
	Simulations					
	Discussion					
	Questions and answe	ers resentation and	discussion			
	At least one case his	tory is used dur	ring each lecture to introduce a	problem with plenty of ph	otographs and videos of	
	geotechnical objects	in their building	g, life or collapse. Investigation	sites are visited as well as	constructions sites. Active	
	Learning Critical Thir	nking frame is u	sed. Notes are prepared rich wit	th illustrations for each le	cture.	
Methods of carrying	Group problem solvin	ng				
out auditory	Traditional literature	analysis	vry on the Web			
exercises	Discussion, brainstor	mina	i y on the web			
	Other	9				
	Problems are solved	in the classroor	m. Active Learning Critical Think	ing frame is used. Distant	: learning is used.	
Methods of carrying	Group problem solvin	ng				
out seminars	Traditional literature	analysis	any on the Web			
	Essav writing	wieuge uiscove	i y on the web			
	Discussion, brainstor	ming				
	Workshop			с., , , , , , , ,		
	Students prepare ser	minars in teams	s (2 persons) and present them i	for the whole group in ord	er to exercise to research	
How construction	Group problem solvi	na				
exercises are held	Discussion, brainstor	mina				
	Students solve indivi	dual assignmer	nts.			
Course content	1.Introduction. Soil c	lasiffication. Ad	ditional stresses, 2h, Learning o	utcomes:1,2		
lectures	2.Soil strength and b	earing capacity	r, 2h, Learning outcomes:1,2			
	4 Introduction into Fi	urocode 7 2h	Learning outcomes:1,2			
	5.Geotechnical repor	ts, 2h, Learning	g outcomes:3			
	6.Shallow foundation	is - requirement	ts, design., 2h, Learning outcom	es:1,2		
	7.Piles and deep four	ndations., 2h, L	earning outcomes:3,4,5,6			
	8.1st test, 2n, Learni 9 Active and passive	ng outcomes:3,	4,5,6 Learning outcomes:3.4.5.6			
	10.Retaining structure	re. Desian of re	taining structure. 2h. Learning o	outcomes:7.9		
	11.Hydraulic failure.,	2h, Learning o	utcomes:3,4,5,6	,.		
	12.Soil improvement	. Ground impro	vement techniques, 2h, Learnin	g outcomes:7,9		
	13. Technical observa	ation in geotech	inics (monitoring), 2h, Learning	outcomes:8		
	15.2nd test, 2h, Lear	ning outcomes:	7,8,9			
Course content	1.Additional stresses	, 2h, Learning c	outcomes:2			
auditory	2.Direct shear test. T	riaxial compres	ssion test, 2h, Learning outcome	s:2		
	4.Bearing capacity a	nd settlement	5.2 Eurocode 7., 2h. Learning outco	mes:2		
	5.No classes		sector and sector and sector and sector			
	6.No classes					
	7.No classes					
I	o.No classes					

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	9. Active and passive pressure Rankine, Coulomb, 2h, Learning outcomes:2
	10.Design of retaining structure according to EC7, 2h, Learning outcomes:2 11.Hydraulic failure, 2h, Learning outcomes:2
	12.No classes
	13.No classes 14.No classes
	15.No classes
Course content	1
seminars	2
	3 Δ -
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	9
	10
	11 12
	12
	14
	15
Course content	1, Learning outcomes:1,2
constructures	2, Learning outcomes:1,2
	3, Learning outcomes:1,2 4 Learning outcomes:1.2
	5.Design of shallow foundations. 1st assignment., 2h, Learning outcomes:1,2
	6.1st assignment., 2h, Learning outcomes:3
	/.1st assignment., 2n, Learning outcomes:3,4,5,6 R *1st assignment - 2h, Learning outcomes:3,4,5,6
	9, Learning outcomes:3,4,5,6
	10, Learning outcomes:3,4,5,6
	11, Learning outcomes: 3,4,5,6 12 Stability of retaining wall-2nd assignment., 2h. Learning outcomes: 3,4,5,6
	13.2nd assignment., 2h, Learning outcomes:7,9
	14.2nd assignment., 2h, Learning outcomes:7,9
	15. *2nd assignment., 2n, Learning outcomes: 7,8,9
Required materials	Basic: classroom, blackboard, chalk General purpose computer laboratory
	Overhead projector
Exam literature	OBVEZNA
	1.Lebo Ž.: Skripta sa predavanja
	2.Nonveiller,E., 1981, Mehanika tla. Temeljenje građevina. Skolska knjiga, Zagreb 3. Roje Bonacci T., 2005, Potnorne građevine i građevne jame, Građevinsko-arbitektonski fakultet Sveučiličta u Splitu
	Institut građevinarstva Hrvatske
	4. Roje-Bonacci,T., 2010, Duboko temeljenje i poboljšanje temeljnog tla, Split : Građevinsko-arhitektonski fakultet
	Sveučilišta
	DOPUNSKA
	1.Wood, D.M., 2004, Geotechnical Modelling, Spon Press, 2004, 504 str.
	2.Bowles, J.E., 1982, Foundation Engineering Handbook, van Nostrand Reinhold Co., 752 str. 3.Clavton, C.R.I. Milititsky, I., Woods, R.I., 1993. Earth Pressure and Earth-Retaining Structures. Blackie Academic
	Professional, 398 str.
Students obligations	4.Eurocode 7: Geotechnical design
Students obligations	1. Regular attendance
	a) Attendance at 11 out of 15 lectures
	(attendance at the regular test is evaluated as attendance at lectures)
	2. Go to two tests and win at least 30 points per test
	3. Create two program assignments, rated with a minimum of 20 points
Knowlodgo	
evaluation during	a) Attendance at 11 out of 15 lectures
semester	(attendance at the regular test is evaluated as attendance at lectures)
	b) Attendance at 15 of 15 exercises
	3. Create two program assignments, rated with a minimum of 30 points
	Istudents who obtain 180 or more points are invited to oral exam directly.



Knowledge evaluation after semester	The exam has a written and oral part.				
Student activities:	AktivnostECTS(Classes attendance)1(Constantly tested knowledge)2(Written exam)1(Oral exam)1				
Remark	This course can be used for final thesis theme				
Prerequisites:	Students cannot enroll in this course unless they have completed Mehanika tla Students cannot enroll in this course unless they have passed Građevinski materijali Students cannot pass this course unless they have passed Mehanika tla				
ISVU equivalents:	22353;				
Proposal made by	mr.sc. Željko Lebo, v. pred., dr.sc. Sonja Zlatović, prof.v.šk.				
Code WEB/ISVU	23353/147433	ECTS	4.0	Academic year	2018/2019
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Name	German Language I				
Status	3rd semester - Undergi	raduate professiona	l study in civil engin	eering (Redovni graditeljstvo) - e	elective course
Teaching mode	Lectures + exercises (a work at home	auditory + laborator	ry + seminar + meto	odology + construction)	30+30 (30+0+0+0) 60
Teachers	Lectures:1. Doc. dr. sc. Auditory exercises: Doo	Lidija Tepeš Golubi c. dr. sc. Lidija Tepe	ić v. pred. š Golubić v. pred.		-
Course objectives	Students will acquire k	nowledge needed to	o successfully transla	ate technical texts. Through syst	emic learning,
	development of genera A2 level (with some ele	al language and grai	mmar competences,	, and practicing of language skill	s, they will achieve the
	Languages.				of Neterence for
Learning outcomes:	1.use adequate technic	ques to consult prof	essional texts, and f	ind relevant information in such	texts. Level:
	communication. Level:	understanding of te	chinical terminology,	and capability to use such term	mology m
	3.demonstrate proficie	ncy in the use of gra	ammatical structure	s. Level:	
	4.interpret technical te	xt and present opin	ion about the text. L	evel:	
	6.show skill in the use	of dictionaries, bilin	aual and monolingua	al. Level:	
	7.translate professiona	l papers from Germ	an language to Croa	atian language. Level:	
Methods of carrying	Ex cathedra teaching				
out lectures	Case studies				
	Questions and answers	5			
	Seminar, students pres	entation and discus	SSION		
	The course is intercultu	ural and interdiscipli	inary. Students are i	ntroduced to scientific and techr	nical achievements of the
	people whose language	e they study (espec	ially in the specialisr	n area).	
Methods of carrying	Group problem solving				
exercises	Discussion, brainstorm	ing			
	The student does vario	us types of exercise	es in auditory recitat	ions, being continuously warned	of cognitive,
	metacognitive and soci	ial and affective lea	rning strategies which	ch make individual learnig easie	r. The student is trained
	media), in order to be a	able to use manuals	s, professional literat	ure, documentation and other k	nowledge sources in
	German, all related to t	the profession they	are trained for. The	student is trained for using vario	ous reading techniques,
	to write short summari	es and use the basi	c busines correspon	dence and to communicate abou	ıt everyday issues.
Course content	1.Introductory lecture,	2h, Learning outcor	mes:1,2,3,4,5,6,7		
	3.Bauingenieurwesen,	2h, Learning outcon	nes:1,2,3,4,5,6,7		
	4.Wie wird man Bauing	enieur(in)?, 2h, Lea	rning outcomes:1,2,	3,4,5,6,7	
	5.Deutsche Grammatik	c, 2h, Learning outco	omes:1,2,3,4,5,6,7 plication 2b Learnir	a_{0} outcomes: 1.2.3.4.5.6.7	
	7.Wie verfasst man ein	en Lebenslauf?, 2h,	Learning outcomes	:1,2,3,4,5,6,7	
	8.Colloquium 1, 2h, Lea	arning outcomes:1,2	2,3,4,5,6,7		
	9.Bauingenieure haber	i ein weites Feld, 2 gen das Aussehen v	2h, Learning outcom	es:1,2,5 art? 2h Learning outcomes:1.2	34567
	11.Traditional building	materials, 2h, Learr	ning outcomes:1,2,3	,4,5,6,7	5,7,5,0,7
	12.Building materials o	f the future, 2h, Lea	arning outcomes:1,2	,3,4,5,6,7	
	13.German loanwords i 14 Die Entwicklung der	in construction voca	abulary, 2h, Learning	g outcomes:1,2,3,4,6,7	
	15.Colloquium 2, 2h, Le	earning outcomes:1	,2,3,4,5,6,7	comes.1,2,3,4,3,0,7	
		-			
Course content auditory	1.Introductory lecture, 2.Bauingenieurwesen.	2h, Learning outcor 2h, Learning outcor	nes:1,2,3 nes:1,2,3,5,6		
	3.Bauingenieurwesen,	2h, Learning outcon	mes:1,2,3,5,6		
	4.Wie wird man Bauing	jenieur(in)?, 2h, Lea	rning outcomes:1,2,	3,4,5,6,7	
	5.German Grammar, 21 6.Motivation and Cover	n, Learning outcome r l etter for a lob Api	es:1,2,3,4,5,6,7 plication, 2h, Learnir	a outcomes:1.2.3.5.6	
	7.Wie verfasst man ein	en Lebenslauf?, 2h,	Learning outcomes	:1,2,3,4,5,6,7	
	8.Colloquium 1, 2h, Lea	arning outcomes:1,2	2,3,4,5,6,7	1 2 4 5	
	9.Bauingenieure haber 10 Wie haben Frfindun	i ein weites Feld, . gen das Aussehen v	2h, Learning outcom (on Bauten veraende	ies:1,2,4,5 ert? 2h Learning outcomes:1.2	3 4 5 6 7
	11.Traditional building	materials, 2h, Learr	ning outcomes:1,2,3	,4,5,6,7	5, ,,,,,,,,,,
	12.Building materials o	of the future, 2h, Lea	arning outcomes:1,2	,3,4,5,6,7	
	13.German Ioanwords I 14 Die Entwicklung der	in construction voca	abulary, 2h, Learning zer 2h Learning out] outcomes:1,2,4,6,7 tcomes:1 2 4	
	15.Colloquium 2, 2h, Le	earning outcomes:1	,2,3,4,5,6,7		
Required materials	Basic: classroom, black	board, chalk			
	Overhead projector	515			
Exam literature	Basic literature:				nha TV/Z daatuura in
	1. A. Kralj-Stih: Deutsch web-stranicama Veleud	i im Bauingenieurw filišta, pripremila Ar	esengramatika s vje gelina Puović profil	ezpama (interna skripta za stude	nte TVZ, dostupna i na
	 Stručni časopisi iz sv 	vih područja gradite	ljstva.Tekstovi dostu	ipni na stranicama Interneta	
	Additional literature:				

	 Rječnici (J. Kljajić, Njemačko-hrvatski praktični rječnik, Školska knjiga, Zagreb, 1998.; M. Uroić, A. Hurm, Hrvatsko- njemački rječnik, Školska knjiga, Zagreb, 1994.; V. Dabac, Tehnički rječnik njemačko-hrvatski, Školska knjiga, Zagreb, 1969; A.Prager: Građevinski rječnik. Masmedija (2003) Gramatike (I. Medić, Deutsche Grammatik fr jedermann, Školska knjiga, Zagreb, 2002.; T. Marčetić, Pregled gramatike njemačkog jezika, Školska knjiga, Zagreb, 2000.; Dreyer - Schmitt: Lehr- und bungsbuch der deutschen Grammatik, Verlag fr Deutsch 2002)M. Čičin-Šain Buljan, J. Kosanović, A. Štampalija, Poslovni njemački 1, Ekonomski fakultet, Zagreb, 1998.
Students obligations	Attending classes and participation in the process
Knowledge evaluation during semester	Preliminary exam 1 and 2; seminar paper and/or pp presentation
Knowledge evaluation after semester	Written and/or oral exam
Student activities:	AktivnostECTS(Written exam)1(Activity in class)1(Essay)1(Oral exam)1
Remark	This course can not be used for final thesis theme
Prerequisites:	No prerequisites.
ISVU equivalents:	39030;39046;
Proposal made by	PhD. Lidija Tepeš Golubić, senior lecturer, 1st of June 2015

Code WEB/ISVU	23350/147429	ECTS	2.0	Academic year	2018/2019
Name	German Language II				
Status	4th semester - Undergr	aduate professional stud	ly in civil engineering (R	edovni graditeljstvo) - el	ective course
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + s	seminar + metodology +	construction)	15+15 (15+0+0+0) 30
Teachers	Lectures:1. Doc. dr. sc. Auditory exercises: Doc	Lidija Tepeš Golubić v. p dr. sc. Lidija Tepeš Gol	pred.		
Course objectives	Students will acquire kr	nowledge needed to such	cessfully translate techn	ical texts. Through syste	mic learning.
	development of genera A2 level (with some ele	il language and gramma ments of B1/B2 levels) a	r competences, and practice common according to the Common	ticing of language skills, European Framework o	they will achieve the of Reference for
Learning outcomes:	Languages.	application in Corman l			
Learning outcomes.	2.analyse technical tex attitude toward the tex 3.prepare a presentatio	t and check hypotheses t they are reading. Leve on in German language c	defined in advance, in o 1:6 In given a technical topic	rder to motivate student c. Level:6,7	s to develop a critical
	4.write an abstract and 5.prepare a technical le 6.present a topic in Ger	a written report about a etter, application, etc Le rman language. Level:6,	i topic read. Level:6,7 evel:6,7 7		
	7.develop language ski 8.combine earlier acqui	Ils in business communic ired knowledge with tech	cation and use basic bus nnical language. Level:6,	iness terminology. Level 7	:6,7
Methods of carrying	Discussion				
outlectures	Questions and answers	entation and discussion			
	Homework presentation	n			
	The course is intercultu people whose language	iral and interdisciplinary. • they study (especially i	Students are introduced n the specialism area).	d to scientific and techni	cal achievements of the
Methods of carrying	Group problem solving				
out auditory	Essay writing	ing			
exercises	Interactive problem sol	vina			
	The student does vario	us types of exercises in a	auditory recitations, beir	ig continuously warned o	of cognitive,
	metacognitive and soci	al and affective learning	strategies which make i	ndividual learnig easier.	The student is trained
	for using dictionaries (b	pilingual, unilingual) and	other manuals (in a trad	litional form or those me	diated by electronic
	German, all related to t	able to use manuals, pro	ressional literature, docu rained for. The student i	imentation and other kni	owiedge sources in
	to write short summarie	es and use the basic bus	iness correspondence ar	nd to communicate abou	t evervdav issues.
Course content	1.Introductory lecture,	2h, Learning outcomes:7	/,8		
lectures	2.German grammar exe	ercises , 2h, Learning ou	tcomes:7,8		
	3.Construction and Buil	lding Materials, 2h, Lear	ning outcomes:6,7,8		
	4.Construction waste M	lanagement , 2n, Learning outcomes	ng outcomes:2,6,7,8		
	6.Hochbau und Tiefbau	, 2h, Learning outcomes	:5,6,7,8		
	7.Colloquium 1, 2h, Lea	arning outcomes:1,2,3,4,	5,6,7,8		
	8.German grammar exe	ercises, 2h, Learning out	comes:7,8	5 6 7 0	
	9.Preparing the docume	entation for building per	mit, 2h, Learning outcom	165:5,6,7,8	
	11.lob application lette	r. 2h. Learning outcome	s:1.4.5.6.7.8	mes.5,0,7,6	
	12.Bridges, 2h, Learnin	g outcomes:4,6,7,8			
	13.Tunnels, 2h, Learnin	ng outcomes:4,6,7,8			
	14.Modern Building Cor	ncepts , 2h, Learning out	comes:4,6,7,8		
	15.Colloquium, 21, Lea	ming outcomes.1,2,3,4,.	5,0,7,0		
Course content	1.Introductory lecture,	2h, Learning outcomes:2	2,6,7,8		
auditory	2.German grammar exe	ercises, 2h, Learning out	comes:2,3,4,5,6		
	3.Construction and buil	ding materials, 2h, Lear	ning outcomes:3,4,5,6,7,	.8	
	5 Building construction	· Hochbau und Tiefbau	s:2,3,4,3,0 2h Tearning outcomes:2	4678	
	6.Building construction	: Hochbau und Tiefbau, 2	2h, Learning outcomes:2	,4,6,8	
	7.Preliminary exam 1, 2	2h, Learning outcomes:1	,2,3,4,5,6,7,8		
	8.German grammar exe	ercises, 2h, Learning out	comes:2,3,4,5,6,7		
	10 Preparing the docume	nentation for building per	rmit 2h Learning outcon	mes:2,3,4,3,0,7,0	
	11.Job application, 2h,	Learning outcomes:1,2,3	6,4,5,6,7,8		
	12.Bridges, 2h, Learnin	g outcomes:2,3,6,7,8			
	13.Tunnels, 2h, Learnin	ig outcomes:2,3,6,7			
	15.Presentation on a gi	ven subject/theme regai	ding profession, 2h, Lea ding profession, 2h, Lea	rning outcomes:1,2,3,4,: rning outcomes:1,2,3,4,!	5,6,7,8 5,6,7,8
Poquired material-	Pacie classroom blad	board chalk			
Required materials	Basic: classroom, black	iboard, chaik Ars			
	Overhead projector				
Exam literature	Basic literature:				
	1. A. Kralj-Stih: Deutsch	n im Bauingenieurwesen	Gramatika s vježbama (i	nterna skripta za studen	te TVZ, dostupna i na
	2 Stručni časopisi iz sv	insta, pripremila Angelin ih područia graditelistva	a ruovic, prot.) Tekstovi dostupni na sti	ranicama Interneta	
I			Tekstovi uostupiii na sti		

	Additional literature: 1. Rječnici (J. Kljajić, Njemačko-hrvatski praktični rječnik, Školska knjiga, Zagreb, 1998.; M. Uroić, A. Hurm, Hrvatsko- njemački rječnik, Školska knjiga, Zagreb, 1994.; V. Dabac, Tehnički rječnik njemačko-hrvatski, Školska knjiga, Zagreb, 1969. 2. Gramatike (I. Medić, Deutsche Grammatik fr jedermann, Školska knjiga, Zagreb, 2002.; T. Marčetić, Pregled
	gramatike njemačkog jezika, Školska knjiga, Zagreb, 2000.; Dreyer - Šchmitt: Lehr- und bungsbuch der deutschen Grammatik, Verlag fr Deutsch 2002)M. Čičin-Šain Buljan, J. Kosanović, A. Štampalija, Poslovni njemački 1, Ekonomski fakultet, Zagreb, 1998.
Students obligations	maximum of 3 absences from exercises
Knowledge evaluation during semester	Colloquium 1 and 2, student papers and student class attendance
Knowledge	Preliminary written exam 1 and 2 (grammar skills and written translation of technical texts).
evaluation after	Written and oral exam at the end of the fourth Semester.
semester	Preliminary written exams 1, 2 replace written exam.
	The oral exam includes three parts: 1. basic conversation on a given subject, 2. retelling of short texts, 3. translation of technical texts.
Student activities:	Aktivnost ECTS
	(Written exam) 1
	(Activity in class) 1
Remark	This course can not be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have completed Njemački jezik u graditeljstvu I Students cannot pass this course unless they have passed Njemački jezik u graditeljstvu I
ISVU equivalents:	22351;155952;
Proposal made by	PhD. Lidija Tepeš Golubić, senior lecturer, 11th of June 2018

Code WEB/ISVU	23356/147442	ECTS	2.0	Academic year	2018/2019
Name	Historical Develepme	ent of Civil Engineering			
Status	6th semester - Buildi	ng Construction (Redovr	ni graditeljstvo) - ok	oligatory course	
Teaching mode	Lectures + exercises	(auditory + laboratory -	+ seminar + metod	lology + construction)	30+0 (0+0+0+0)
Teachers	work at nome	ažen Arbutina dinl ing ar			30
Course objectives	Introduction to princi	ipal terms used in the ex	tensive field of civi	l engineering, with a particul	ar emphasis on historic
	forms of structures/b systems, and constru	uildings, stylistic and typ uction methods used thre	pological properties oughout the history	s of structures/buildings, deve of mankind.	elopment of structural
Learning outcomes:	1.identify historic form 2.differentiate stylisti 3.analyse basic speci 4.sketch elements of 5.evaluate specific re	ms of civil engineering. I ic and typological proper ific features of structural ⁱ stylistic, plastic and fun equirements during work	Level:6 rties of buildings. L I systems of historio actional properties of on historic and mo	evel:6 c buildings. Level:6 of historic buildings. Level:6 onumental buildings. Level:6,	7
Methods of carrying	Ex cathedra teaching	1			
out lectures	Guest lecturer Case studies Discussion Questions and answe Seminar, students pr Homework presentat Other The following topics v oriented buildings);ur garden art);civil engi engineering structure continents, including	ers esentation and discussion ion will be examined in chro rbanism and developme neering (roads and trans es, bridges, tunnels, etc. some significant examp	on inological order :arc int of space (towns sport systems, aqu .)General developm oles from Croatia, w	chitecture (sacral, sepulchral, and other historic settlement educts and water facilities, m ent of building practices in E ill be presented, including al	profane and defence s, landscape cultivation, nunicipal infrastructure, urope and on other so some general
Course contout	Information about cu	Itural, historical and arti	stic context of indiv	/idual periods.	anning suing, uplationship
Lourse content lectures	1. INTRODUCTION (02 between building cor periodisation, styles, PREHISTORY, PROTOI 2.EGYPT, 2h, Learnin 3.MESOPOTAMIA (Sur MEDITERRANEAN MIL PERSIA, 0.5h, Learnin 4.PREHELLENIC AEGE GREECE, 1.5h, Learnin 5.ETRURIA, 0.5h, Learnin 6.EARLY CHRISTIAN F BYSANT AND BYZANT ISLAM, 0.5h, Learnin 7.PRE-ROMANESQUE ROMANESQUE PERIO 8.GOTHICS, 2h, Learn 9.RENAISSANCE AND 10.BAROQUE, ROCOC 11.9TH CENTURY ANI Learning outcomes:1 13.ANCIENT EXTRA-E South Americas), 2h, 14.TRADITIONAL (PO 15.PROTECTION OF C Learning outcomes:1	asic terminology: relatio istruction and civil engin origin and development HISTORY, 1h, Learning o g outcomes:1,2,3,4 mer, Akkad, Babylonia, A DDLE EAST (Kanan, Pales ig outcomes:1,2,3,4 EAN CIRCLE (Malta, Cycla ing outcomes:1,2,3,4,5 PERIOD , 0.75h, Learning TINE CRICLE (Italy, Balka g outcomes:1,2,3,4,5 PERIOD , 0.75h, Learning UD, 1.5h, Learning outco ning outcomes:1,2,3,4,5 PERIOD , 0.5h, Learning OD, 1.5h, Learning outco ning outcomes:1,2,3,4,5 MANIRISM, 2h, Learning CO AND EARLY CLASSICI D EARLY 20TH CENTURY .,2,3,4,5 SUROPEAN CULTURES (In Learning outcomes:1,2, .PULAR) CONSTRUCTION CULTURAL HERITAGE AN .,2,3,4,5	nsnip between arcr peering; relationshi utcomes:1,2,3,4,5 Assyria), 1h, Learni stine, Phoenicia, Sy ades, Cyprus, Crete g outcomes:1,2,3,4, ins, Asia Minor, Rus g outcomes:1,2,3,4, inse:1,2,3,4,5 g outcomes:1,2,3,4,5 g	15 pbetween the science, art ar pbetween the science, art ar s and types) , 1h, Learning out ng outcomes:1,2,3,4 ria, Hittites) , 0.5h, Learning e, Asia Minor , 0.5h, Learning 5 sia) , 0.75h, Learning outcom 5 ,5 utcomes:1,2,3,4,5 oricism, Secession, Art Deco, ter the second world war, pre na, Japan, Africa, Oceania, Au arning outcomes:1,2,3,4,5 S USED IN RENOVATION OF H	engineering; relationship id engineering; principal itcomes:1,2,3,4,5 outcomes:1,2,3,4 outcomes:1,2,4 hes:1,2,3,4,5 Late Academism), 2h, sent-day construction) , 2h, ustralia, North, Central and HSTORIC BUILDINGS, 2h,
Required materials	Basic: classroom, bla Whiteboard with mar Overhead projector Portable overhead pr Video equipment	ckboard, chalk ·kers ·ojector			
Exam literature	Basic literature: 1. J.J. NORWICH; N. PI 2. D. Arbutina: Povije 3. Z. KARAČ: Povijesr Additional literature: 1. B. Zevi: Povijest m 2. B. MILIĆ: Razvoj gr 3. W. MULLER; G. VO 4. K. FREMPTON: Moo 5. H.W. JANSON: Povi 6. A. FREUDENREICH 7. T. MARASOVIĆ: Ak	EVSNER: Velike arhitektu Isni razvoj graditeljstva [ni razvoj graditeljstva [in Ioderne arhitekture, Arhi rada kroz stoljeća, I-III, Z GEL: Atlas arhitekture, I- derna arhitektura. Kritičk ijest umjetnosti, Varaždii I: Kako narod gradi, Zagr tivni pristup graditeljsko	ure svijeta, Zagreb, separati predavanj iterna skripta],Zagr itektonski fakultet S 'agreb, 19911995 -II, Zagreb, 19992 (a povijest, Zagreb, n, 2003.; reb, 1972.; om naslijeđu, Split,	, 1981.; a],Zagreb, 2011. eb, 2005. 5veučilišta u Zagrebu, Zagreb 2002.; 000.; . 1992.; 1985.;	o, 2007.;

Students obligations	Class attendance - measured as a minimum presence on 75% of the classes.
Knowledge evaluation during semester	During the semester, students will have short proficiency tests and other methods of their work evaluation (short assessment or short proficiency tests are possible on each of the classes, before or after the end of the presentation, as well as individual and group presentations and analysis of smaller student seminar tasks, with a record of students activities during discussion). During the semester two major colloquiums are planned.
Knowledge evaluation after semester	The final examination consists of the written part of of the test (including written and graphical) and the oral examination.
Student activities:	AktivnostECTS(Written exam)1(Oral exam)1
Remark	This course can not be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have passed Betonske konstrukcije II

Code WEB/ISVU	23465/155974	ECTS	4.0	Academic year	2018/2019
Name	Hydraulic Structures				-
Status	5th semester - Civil Eng	gineering (Water and trai	ffic infrastructure) (Redo	vni graditeljstvo) - obliga	atory course
Teaching mode	Lectures + exercises (a	uditory + laboratory + s	eminar + metodology +	construction)	30+15 (9+0+0+6)
	work at home				75
Teachers	Lectures: Ivana Bartolić	: , pred. Detriže o dial in a suo đ			
	Lectures: dr.sc. Miaden	Petricec dipi.ing.grad.			
	Auditory exercises: Zerj	islav Rupčić			
	Construction exercises:	Berislav Rupčić			
Course objectives	Students will gain basic	theoretical knowledge of	on water management s	tructures and facilities, a	s well as practical skills
	for participation in the p	project development and	l design process.		
Learning outcomes:	1.test sea water conditi	ion in nature, and test a	marine structure on a pl	nysical model in the scop	be of an expert team.
	Level:6 2 draw a marino structu	in the scope of a des	ian toom Loval:6		
	3. prepare bill of quantit	ties for a massive concre	te marine structure and	an earthfill marine struc	ture. Level:6
	4.analyse a massive co	ncrete marine structure	and an earthfill marine s	structure in the scope of	a design team. Level:6
	5.check stability of a co	oncrete gravity dam. Lev	el:6		-
	6.make calculations for	the spillway and bottom	outlet of a dam. Level:	5	
	/.calculate annual prod	luction of a run-of-river h	ydropower plant. Level:	6 acad on the tenegraphic	survey data Levelia
	9 differentiate types of	flow regulation Level.6	on and recarding basin b	ased on the topographic	Survey data. Levelto
	siumerenduce types of	now regulation. Leveno			
Methods of carrying	Ex cathedra teaching				
out lectures	Case studies				
	Discussion				
	Other	h aid of modeless had be		maniad by aviataffa with	we are the set
	illustrations. Following l	n ald of modern technica	signments to motivate t	panied by printons with hem to follow and under	most important
	matter dealt with in lec	tures.	signments to motivate t		stand the subject
Methods of carrying	Group problem solving				
out auditory	Mind mapping				
exercises	Computer simulations				
	Other	paration of programs			
How construction	Other				
exercises are held	Students independently	work on program with o	constant supervision and	help of teacher	
Course content	1.Overview of marine st	tructures. 2h. Learning o	utcomes:1.2	·····	
lectures	2.Sea waves - theory, fo	orecasts, design waves,	sea levels , 2h, Learning	outcomes:1,2	
	3.Sea waves - theory, fo	orecasts, design waves,	sea levels , 2h, Learning	outcomes:1,2	
	4.Sea waves - theory, fo	orecasts, design waves,	sea levels , 1h, Learning	outcomes:1,2	
	Design of typical marine	e structures, In, Learnin ino structuros, 2h Loarn	g outcomes:2,3		
	6.Design of typical mar	ine structures. 2h. Learn	ing outcomes:2.3		
	7.Maritime construction	technology , 2h, Learni	ng outcomes:2,3		
	8.Preliminary exam, 1h	, Learning outcomes:2,3			
	Inflow regulation - dema	and and types, purpose,	components and sizing	of reservoirs, 1h, Learnin	ng outcomes:8,9
	10 Inflow regulation - de	emand and types, purpos	e, components and sizin	ng of reservoirs, 211, Lean	ing outcomes:0,9
	11.Dams - types and siz	zing, 2h, Learning outcor	nes:3,4,5	ng of reservoirs, 21, Lea	Thing outcomes.0,5
	12.Dams - types and siz	zing, 1h, Learning outcor	mes:3,4,5		
	Preliminary exam, 1h, L	earning outcomes:3,4,5	,8,9		
	13.Intake and outlet, 2	h, Learning outcomes:6			
	Preliminary exam. 1h. l	earning outcomes:4.5.6			
	15.Powerhouse, 1h, Lea	arning outcomes:7			
	Preliminary exam - corr	ections, 1h, Learning ou	tcomes:1,2,3,4,5,6,7,8,9)	
-					
Course content	1.Breakwater stability,	1h, Learning outcomes:	.,2,3		
auditory	3 Conceptual design of	hreakwaters 1h Learni	.,2,3 na outcomes:1.2.3		
	4.Conceptual design of	breakwaters, 1h, Learni	ng outcomes:1,2,3		
	5.Conceptual design of	breakwaters, 1h, Learnin	ng outcomes:1,2,3		
	6.nema vjebi				
	7.nema vjebi 8. Gravitv dam stabilitv	1h Loorning outcomos	4 5		
	9. Spillway calculation. 1	1h, Learning outcomes:6	4,5		
	10.Bottom outlet calcul	ation, 1h, Learning outco	omes:6		
	11.Run-off-the-river pla	nt output calculation, 1h	, Learning outcomes:7		
	12.nema vjebi				
	13.nema vjebi				
	15.nema vjebi				
Course content	1.nema vjebi				
constructures	2.nema vjebi				
	3.nema vjebi				

	4.nema vjebi 5.nema vjebi 6.Breakwater stability, 1h, Learning outcomes:2,3,4 7.Breakwater stability, 1h, Learning outcomes:2,3,4
	8.nema vjebi 9.nema vjebi
	10.nema vjebi 11.nema vjebi
	12.Gravity dam stability, 1h, Learning outcomes:5 13.Spillway calculation, 1h, Learning outcomes:6
	14.Bottom outlet calculation, 1h, Learning outcomes:6 15.Run-off-the-river plant output calculation, 1h, Learning outcomes:7
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Gworboard projector
	Video equipment
	Students independently work on program with constant supervision and help of teacher
Exam literature	P. Stojić: Hidrotehničke građevine I i II, FGZ Split, 1997., 1998. Z. Tadejević, M. Pršić: Pomorska hidraulika I, skripta Građevinskog fakulteta, Zagreb, 1981. HKIG: Program iskorištenja slobodnog hidropotencijala u Republici Hrvatskoj Separati koje priprema pastavnik
Students obligations	Regular attendance - max 25% of absence
j	At least 10 points from each of three colloquiums (each colloquium max 20 points), homeworks, and exercises
Knowledge evaluation during semester	Total max 60 points less then 30 points, underachivement
Knowledge	Written part of 40 points. Student have to achive min 20 points.
evaluation after	Total with points from colloquium max 100 points
semester	80-89.9=4
	65-79,9=3
	50-64,9=2
.	less then 50 points, underachivement
Student activities:	AKTIVNOST EUIS (Classes attendance) 1
	(Constantly tested knowledge) 1
	(Practical work) 1
	(Written exam) 1
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have completed Vodogradnje
	Students cannot enroll in this course unless they have passed Usnove hidroiogije i hidraulike
	Students cannot enroll in this course unless they have passed Proračun konstrukcija
	Students cannot enroll in this course unless they have completed Hidrologija i hidraulika
	Students cannot pass this course unless they have passed Vodogradnje Students cannot pass this course unless they have passed Hidrologija i hidraulika
ISVU equivalents:	22375;
Proposal made by	Senior Lecturer Željko Pavlin 24.02.2014

Code WEB/ISVU	23439/155936	ECTS	5.0	Academic year	2018/2019
Name	Hydrology and Hydraul	ics		-	-
Status	4th semester - Undergi	raduate professional stud	ly in civil engineering (R	edovni graditeljstvo) - el	ective course4th
	semester - Undergradu	ate professional study in	civil engineering (Redo	vni graditeljstvo) - electi	ve course
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + s	seminar + metodology +	 construction) 	30+30 (12+0+6+12) 90
Teachers	Lectures: Ivana Bartolio	ć , pred.			
	Lectures:dr.sc. Mladen	Petričec dipl.ing.građ.			
	Auditory exercises: Iva	na bartolic , preu. n Kalinić mag ing aedif			
	Seminar exercises: Iva	na Bartolić , pred.			
	Seminar exercises: Fili	o Kalinić mag. ing. aedif.			
	Construction exercises	: Ivana Bartolić , pred.			
	Construction exercises	: Filip Kalinić mag. ing. a	edif.		
Course objectives	Students will learn how process of problem-sol	v to recognise and indeper ving activities related to	endently solve tasks in ti water management.	he fields of hydrology an	d hydraulics, in the
Learning outcomes:	1.present and define b	asic properties of meteor	ological and hydrologica	al sequences of precipita	tion, temperatures,
	water levels, flows. Lev	vel:6,7		ators (material and flam)	Laurah C
	2.calculate frequency a	tical parameters for bydr	asic nyurological param ological data sets. Level	eters (water level, flow).	Level:0
	4.calculate dimensions	of simple systems unde	r pressure (pump, pipelii	.o ne). Level:6	
	5.propose solutions for	simple canal facilities (s	ill, spillway, stilling basir	n, etc.). Level:6,7	
	6.calculate ground wat	er discharge toward well	s and structures by hydr	raulic method. Level:6	
Methods of carrying	Ex cathedra teaching				
out lectures	Other				
	Water flow patterns an	d methodology of calcula	ating values related to w	ater flow explained on e	xamples and graphic
	representations. Graph	ic representations and p	hotographs will give insi	ght into the characterist	ics of water works.
	During lectures studen	ts are motivated to parti	cipate by questions and	explanations.	
Methods of carrying	Group problem solving				
out auditory	Discussion, brainstorm	Ing blackboard with active	narticipation of students	A planned visit to prac	tical examples of
exercises	characteristic hydraulio	structures and a hydrau	ilic laboratory (Faculty o	of Civil Engineering and/c	or Croatian Institute of
	Civil Engineering).			i eitii Eilgiileeiliig alla,o	
Methods of carrying	Discussion, brainstorm	ing			
out seminars	Other				
	Seminar work and pres	entation of work and exp	planation.		
How construction	Group problem solving				
exercises are neid	As part of design exerc	ises a preparation of tw	o programs is planned		
Course content	1. Introduction to the su	biect and plan of that st	udv., 1h		
lectures	Hydrometric measuren	nents and analysis of col	lected data., 1h, Learnin	g outcomes:1	
	2.Hydrometric measure	ements and analysis of c	ollected data., 2h, Learn	ing outcomes:1	
	3.River basin drainage.	., 2h, Learning outcomes	:1		
	4.0rban drainage., 1n, Hydrological processes	in watercourses 1h L	earning outcomes 2		
	5.Hydrological process	es in watercourses. , 1h, 1	Learning outcomes:2		
	Mathematical statistic	calculations., 1h, Learnin	g outcomes:3		
	6.Mathematical statisti	c calculations., 2h, Learr	ing outcomes:3		
	7.Water flows in pressu	ire systems., 2h, Learnin	g outcomes:4		
	9.No lessons.	zh, Learning outcomes:1	,2,3		
	10.Hydraulics of water	supply and hydropower	generation., 2h, Learning	g outcomes:4	
	11.Water flows in open	watercourses., 2h, Lear	ning outcomes:5	-	
	12.Overflow and seepa	ge through water works.	, 1h, Learning outcome	s:5	
	Hydraulic jump., 1h, Le	arning outcomes:5	6		
	Hydraulic theory of gro	, in, Learning outcomes. undwater flow - flow cal	ulation to water supplie	s (wells, galleries)., 1h, l	_earning outcomes:6
	14.Hydraulic theory of	groundwater flow - flow	calculation to water supp	plies (wells, galleries)., 1	h, Learning outcomes:6
	Basics of the theory of	potential flow in porous	media., 1h, Learning out	comes:6	
	15.II. preliminary exam	, 2h, Learning outcomes	:4,5,6		
	Repeated I or II. prelim	inary exam., 2h, Learnin	g outcomes:1,2,3,4,5,6		
Course content	1 Introductory explana	tion of the content and o	rganization of exercises	2h	
auditory	2.Solving examples rur	off and processing of hy	drological measurement	s., 2h, Learning outcom	es:1,2
	3.Determination of flow	v curve and distribution o	of characteristic flows., 2	h, Learning outcomes:3	
	4.No lessons.				
	5.No lessons.				
	b.No lessons.	ny flow under proceure	2h Loorning outcomos	Λ	
	8.Calculations of station	nary uniform flow in one	n watercourses. 2h. Lea	rning outcomes:5	
	9.Calculation of seepad	ge, overflow and hydrauli	c jump., 2h, Learning ou	itcomes:5	
	10.Calculation of flow t	owards wells in porous e	nvironments under spec	ific boundary conditions:	., 2h, Learning
	outcomes:6				
	11.NO IESSONS.				
I	122.100 16350115.				

	13.No lessons. 14.No lessons.
	15.No lessons.
Course content seminars	1.No lessons. 2.No lessons.
	4.Explanation of contents ways to solve I. seminar work, 1h, Learning outcomes:2,3 5.No lessons.
	6.The presentation and explanation I. seminar work, 2h, Learning outcomes:2,3 7.No lessons.
	8.No lessons. 9.Nema nastave.
	10.No lessons. 11.Explanation of contents ways to solve II. seminar work, 1h, Learning outcomes:4
	12.No lessons. 13.Explanation of contents ways to solve III. seminar work., 1h, Learning outcomes:5
	14.No lessons. 15.The presentation and explanation II. and III. seminar work., 2h, Learning outcomes:4,5
Course content constructures	1.No lessons. 2.No lessons. 3.No lessons.
	4.Work on the first seminar task in the area of hydrology., 1h, Learning outcomes:2,3 5.Work on the first seminar task in the area of hydrology., 2h, Learning outcomes:2,3 6.No lessons.
	7.No lessons. 8.No lessons.
	9.No lessons. 10.No lessons. 11. Work on the second, cominar task, flow systems under pressure. The Learning sutcomes:4
	12. Work on the second, seminar task - flow systems under pressure., 2h, Learning outcomes:4 12. Work on the second, seminar task - flow in open channels - 1h, Learning outcomes:5
	14.Work on the III. seminar task - flow in open channels., 2h, Learning outcomes:5 15.No lessons.
Required materials	Basic: classroom, blackboard, chalk Special purpose computer laboratory
	Whiteboard with markers Overhead projector
	Video equipment Planned to attend experiments in hydro-technical laboratory GF in Zagreb or field work of hydrological measurements.
Exam literature	Osnovna: 1. Mladen Petričec: Hidrologija i hidraulika - interna skripta, Zagreb 2011. 2. Živko Vuković: Osnove hidrotebnike I/1. Akvamarine Zagreb, 1996.
	3. Ranko Žugaj: Hidrologija, RGN fakultet, Zagreb 2000. Dodatna:
	1. Dionis Srebrenović: Primijenjena hidrologija, Tehnička knjiga, Zagreb, 1986. 2. I. Agroskin i suradnici: Hidraulika, Tehnička knjiga, Zagreb, 1973. 3. Vinko lović: Osnove bidromehanike, Element, Zagreb, 2006.
Students obligations	Attendance of lectures and exercises. In the two preliminary exams and three seminars achieve a minimum score of 30 mark points.
Knowledge evaluation during semester	During the semester, on preliminary exams and seminars, student can achieve maximum 60 mark points. Student which achieve at least 30 mark points during the semester is allowed to take a final exam. Student which during the semester achieve more than 15 and less then 30 mark points can take additional test. If student after additional test achieve at least 30 mark points she/he is allowed to take an final exam. Student which during semester achieve at least 30 mark points she/he is allowed to take an final exam.
Knowledge	All students must take a final exam to pass the subject. On final exam, which typically consists of written (solving
evaluation after semester	numerical problems) and oral part, students can achieve 40 mark points. For the positive evaluation of the exam student should achieve at lest 20 mark points (50 %). The final subject mark contains of mark points scored during the semester and on final exam: 90 - 100 - A 80 89.9 - B 65 79.9 - C 60 - 64.9 - D
Chudent - sth !!!	50 59.9 - E
Student activities:	Aktivnost ECIS (Constantly tested knowledge) 3 (Oral exam) 2
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have completed Osnove hidrologije i hidraulike Students cannot pass this course unless they have passed Osnove hidrologije i hidraulike



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ISVU equivalents:	22372;
Proposal made by	Dr.sc. Mladen Petričec, prof. v.šk.

Code WEB/ISVU	22993/39869	ECTS	2.0	Academic year	2018/2019		
Name	Introduction to Hydraulic Structures						
Status	4th semester - Undergraduate professional study in civil engineering (Redovni graditeljstvo) - obligatory course						
Teaching mode	Lectures + exercises (a	auditory + laboratory + s	eminar + metodology +	construction)	15+15 (15+0+0+0)		
	work at home				30		
Teachers	Lectures:1. mr.sc. Gora	na Ćosić-Flajsig viši pred	lavač				
	Lectures:dr.sc. Mladen	Petričec dipl.ing.građ.					
	Auditory exercises: Fill	p Kalinic mag. ing. aedir. ian Kovačević dinl ing gra	ađ				
Course objectives	Teach students to reco	anise the significance an	d role of hydraulic engin	eering in water manage	ment types of		
course objectives	structures and their design.						
Learning outcomes:	1.classify types of ener	gy from the utilisation as	spect. Level:6,7				
_	2.classify water power.	Level:6,7					
	3.differentiate types of	hidropower plants and the	heir components. Level:6	5			
	5. differentiate types of marine structures. Level:6						
	5.umerenciate types of water supply systems. Level:0 6 differentiate types of sewage systems. Level:6						
	7.classify water supply	system consumers and v	wastewater types. Level:	6,7			
	8.identify regulation ty	pes. Level:6					
	9.differentiate types of	drainage and irrigation s	structures. Level:6				
	10.differentiate types o	of water ways and facilitie	es/structures. Level:6				
Methods of carrying	Ex cathedra teaching						
out lectures	Case studies						
	Discussion						
	Students are gradually	introduced to the basics	of water management s	tructures through graph	ic presentations,		
	photographs and expla	nations.					
Methods of carrying	Group problem solving						
out auditory	Mind mapping Through a carefully set	acted set of tasks studer	nts are taught basic calcu	lations of elements for i	ndividual water works		
exercises	which were dealt with o	durina lectures.			narvidual water works,		
Course content	1.Energy and power-div	vision, 1h, Learning outco	omes:1				
lectures	2.Basic types of hydrop	ower plants, 1h, Learnin	g outcomes:3				
	3.The main buildings of	f hydropower plant, 1h, L	earning outcomes:3				
	4.Overview of marine c	construction buildings, 1h	i, Learning outcomes:4				
	6 Buildings of public water	ystems, In, Learning out	Learning outcomes:5				
	7.Public sewage system	ns, 1h, Learning outcome	es:6				
	8.Building of public sev	vage systems, 1h, Learni	ng outcomes:6				
	9.Wastewater treatmer	nt, 1h, Learning outcome	s:7				
	10.The Second Collogu	ium, 1h, Learning outcon	nes:5,6,7				
	12. River regulation - El	vdrologic-hydraulic chara	cteristics. 1h. Learning c	utcomes:8			
	13.Amelioration - Drain	age and Irrigation, 1h, Le	earning outcomes:9				
	14.Inland waterways, 1	.h, Learning outcomes:9	-				
	15.Oral part of exam, 1	h, Learning outcomes:1,	2,3,4,5,6,7,8,9,10				
Course content	1 Dacie principles of we	tor nower the Learning	autoomoo:2				
Course content	2 The basic elements of Wa	of selecting the type of by	outcomes:z	a outcomes:3			
additory	3.The basic elements o	of the main building hydro	power plants, 1h, Learn	ing outcomes:3			
	4.The basic elements o	of the quay, breakwater a	nd ports, 1h, Learning o	utcomes:4			
	5.The first colloquium,	1h, Learning outcomes:1	,2,3,4	_			
	6.Basis of public water	supply system calculatio	on, 1h, Learning outcome	s:5			
	8 Basis of public water	supply system calculation 1h	Learning outcomes 6	5.0			
	9.Basis of public sewag	je system calculation, 1h	, Learning outcomes:6				
	10.Regulating construct	tions, 1h, Learning outco	omes:8				
	11.Basis of melioration	drainage calculaton, 1h,	Learning outcomes:8,9				
	12.Basis of melloration	Irrigation calculation, 1h	, Learning outcomes:9				
	14 The third colloquium	n 1h Learning outcomes	::8 9 10				
	15.Remedial Colloquiur	m, 1h, Learning outcome	s:1,2,3,4,5,6,7,8,9,10				
		-					
Required materials	Whiteboard with marke	ers					
	Overhead projector						
	Video equipment Through a carefully sel	acted set of tasks studer	nts are taught basic calcu	lations of elements for i	ndividual water works		
	which were dealt with o	durina lectures.			narvidual water works,		
Exam literature	Ž. Vuković: Osnovi hidr	otehnike I/1 i I/2, 1996. Z	Zagreb				
Students obligations	Regular attendance - a	maximum of 25% of exc	used absences.				
	At least 10 points from	each of the three colloqu	uiums, each colloquium i	max 20 points, and three	e homeworks		
Knowledge	Three written colloquiu	ms with 20 points .					
evaluation during	For each colloquium is	necessary to accomplish	min. 10 points.				
semester	total max. 60 points.	iovomont					
	30-38.9 noints= 2	ievenient.					
l							

	39-47,9 points=3 48-53,9 points= 4 54-60 points=5
Knowledge	No exam after the end of the semester.
evaluation after	Rating is based on the results of the colloquium:
semester	30-38,9 points = 2
	39-47,9 points = 3
	48-53,9 points = 4
	54-60 points = 5
Student activities:	Aktivnost ECIS
	(Classes attendance) 1 (Construction to the standard of the st
Demende	(constantly tested knowledge) I
Remark	This course can not be used for final thesis theme
Prerequisites:	Students cannot pass this course unless they have passed Usnove hidrologije i hidraulike
	Students cannot enroll in this course unless they have completed Osnove hidrologije i hidraulike
ISVU equivalents:	22344;
Proposal made by	Senior Lecturer, Željko Pavlin, 24.02.2014.

Study programme	for academic y	ear 2018/2019
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Code WEB/ISVU	23455/155964	ECTS	5.0	Academic year	2018/2019
Name	Introduction to Hydr	ology and Hydrau	llics	· ·- · · · · · · · · · · · · · · · · ·	
Status Tarahing mada	3rd semester - Unde	rgraduate profes	sional study in civil engin	neering (Redovni graditeljstvo) -	obligatory course
leaching mode	Lectures + exercises work at home	; (auditory + labo	oratory + seminar + met	odology + construction)	30+15 (12+0+3+0) 105
Teachers	Lectures: Ivana Bart Lectures:dr.sc. Mlad Auditory exercises: I Auditory exercises: F Seminar exercises: I	olić , pred. en Petričec dipl.ir vana Bartolić , pr Filip Kalinić mag. vana Bartolić , pr	ng.građ. red. ing. aedif. ed.		
Course shisetings	Seminar exercises: F	ilip Kalinić mag.	ing. aedit.	and shakes of makers	and have to ask a simula
Course objectives	problems in the field	s of hydrology ar	nd hydromechanics.	processes and states of water,	and now to solve simple
Learning outcomes:	1.analyse and select temperature, evapor 2.sort (systematise) Level:6 3.solve simpler prob 4.calculate basic par 5.calculate basic hys 6.identify and resolv	dominant indica ation, drainage-t meteorological a lems relating to t ameters for an ic draulic parameter e elementary pro	tors for evacuation of wa basin properties, etc.). Le ind hydrological measure the field of hydrostatics. deal liquid flow under pre rs for the open stream flo bblems of water flow in p	iter from smaller drainage basin wel:6 ment data of significance for wa Level:6 issure. Level:6 iw. Level:6 orous media Level:6	s (precipitation, ater runoff calculations.
Methods of carrying out lectures	Ex cathedra teaching Discussion Questions and answ Lectures on occurrer graphic presentatior for measurements o modern tools, graph questions and requir) ers ice and flow of w is. Graphic repres f rainfall quantitie ic materials and p ing explanations	rater in the nature and wa sentations and photograp es and flow in watercours photographs. During lect	ater balancing will be explained obs will give insight into basic in ses. Basic hydraulic terminology ures students are motivated to	on simple examples and struments and equipment is explained with aid of participate by asking
Methods of carrying out auditory	Group problem solvi Tasks are solved on the State Meteorolog	ng the backboard, w gical and Hydrolo	vith active student partic	ipation. It is planned to visit and	l learn about the tasks of
Methods of carrying	Traditional literature	analysis			
out seminars	Data mining and kno Other	wledge discover	y on the Web		
Course content lectures	1.Introduction to the Water and water res 2.Water cycles in na 3.Monitoring and me outcomes:2 4.Monitoring and me outcomes:2 5.No lessons. 6.Pressure diagrams 7.Pressure diagrams 7.Pressure diagrams 8.Types of movement, 8.Types of movement, 8.Types of movement, 10.1. Preliminary exa 11.Flow under press 13.Basic notions on 14.Basics on water f 15.II. Preliminary exa Repeated I or II. prel	subject and plan ources, physical ture, runoff, drair asurement of me asurement of me and water press and water press velocity, acceler it, velocity, acceler it, velocity, acceler ing., 2h, Learning ure., 2h, Learning ure., 2h, Learning flow in open wate low through poro am., 2h, Learning iminary exam., 2	n of that study., 1h characteristics of water., nage area runoff, flow in eteorological and hydrolo eteorological and hydrolo ure forces., 2h, Learning ure forces., 1h, Learning ration and law of conserv eration and law of conserv eration and law of conserv outcomes:1,2,3 g outcomes:4 g outcomes:4 ercourse., 2h, Learning or us environment., 2h, Lear h, Learning outcomes:1,7	2h, Learning outcomes:1 watercours., 2h, Learning outco gical phenomena and their char ogical phenomena and their char outcomes:3 outcomes:3 ation of mass., 1h, Learning out rvation of mass., 2h, Learning out utcomes:5 irning outcomes:6 2,3,4,5,6	mes:1 racteristics., 2h, Learning racteristics., 2h, Learning comes:4 utcomes:4
Course content auditory	1.Introduction to the 2.Calculation examp 3.Calculation examp 4.Average rainfall in 5.Average rainfall in 6.Determination of p 7.Determination of p 9.Prora brzine i ubrz 10.Prora brzine i ubrz 11.Examples of stati 12.Examples of stati 13.Determination of Learning outcomes: 14.Determination of Learning outcomes: 15.Simple examples	subject and met les for evapotran les for evapotran a basin, and desi a basin, and desi ressure diagram ressure diagram ressure diagram anja, kolia gibanj zanja, kolia gibanj zanja, kolia gibar onary flow of an onary flow of an specific energy c specific energy c of water seepag	thod of that study., 1h ispiration., 1h, Learning of ispiration., 1h, Learning of ign rainfall intensity., 1h, ign rainfall intensity., 1h, and water pressure on s and water pressure on s and water pressure on s a., 1h, Learning outcome nja., 1h, Learning outcome ideal liquid under pressu ideal liquid under pressu ideal liquid under pressu of profile, and calculation of profile, and calculation e through a porous envir	outcomes:1 butcomes:1 Learning outcomes:2 tructures., 1h, Learning outcom tructures., 1h, Learning outcom tructures., 1h, Learning outcom tructures., 1h, Learning outcom es:4 re., 1h, Learning outcomes:4 of stationary uniform flow in op of stationary uniform flow in op onment , 1h, Learning outcomes	es:3 es:3 es:3 een watercourses., 1h, een watercourses., 1h, s:6



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Course content	1.No lessons.
seminars	2.No lessons
	3.No lessons.
	4.No lessons.
	5.No lessons.
	6.No lessons
	7.No lessons.
	8.Explanation of tasks and ways of solving I. seminar work., 2h, Learning outcomes:1,2,3
	9.No lessons.
	10.No lessons.
	11.No lessons.
	12.No lessons.
	13.Explanation of tasks and ways of solving I. seminar work., 2h, Learning outcomes:4,5,6
	14.No lessons.
	15.No lessons.
Required materials	Basic: classroom, blackboard, chalk
	Whiteboard with markers
	Overhead projector
	Operating supplies
	- · · · ·
Exam literature	Basic literature:
	1. Osnove hidrologije i hidralike, skripte, i ehničko veleučiliste u Zagrebu, 2011.
	2. Zivko Vuković: Osnove hidrotehnike I/I, Akvamarine Zagreb, 1996.
	J. Ranko Zugaj: Hidrologija, RGN fakultet, Zagreb 2000.
	Additional literature:
	1. Dionis Srebrenović: Primijenjena hidrologija, Tehnička knjiga, Zagreb, 1986.
	2. Vinko Jović: Osnove hidromehanike, Element, Zagreb, 2006.
Students obligations	Attendance of lectures and exercises.
	In the two preliminary exams and two seminars achieve a minimum score of 30 mark points.
Knowledge	During the semester, on preliminary exams and seminars, student can achieve maximum 60 mark points. Student
evaluation during	which achieve at least 30 mark points during the semester is allowed to take an final exam.
semester	Student which during the semester achieve more than 15 and less then 30 mark points can take additional test. If
	student after additional test achieve at least 30 mark points she/he is allowed to take an final exam.
	Student which during semester achieve less than 15 mark points in the next year must enroll the subject again.
Knowledge	All students must take a final exam to pass the subject. On final exam, which typically consists of written (solving
evaluation after	numerical problems) and oral part, students can achieve 40 mark points.
semester	For the positive evaluation of the exam student should achieve at lest 20 mark points (50 %).
	The final subject mark contains of mark points scored during the semester and on final exam:
	90 - 100 - A
	80 - 89.9 - В
	65 - 79.9 - C
	60 - 649 - D
	50 - 59.9 - E
	The exam consists of written and oral parts.
	The written exam consists in solving tasks.
	A necessary condition for the oral part of the exam is the realization of 50% and more resolved the written part of the
	exam.
Student activities:	Aktivnost ECTS
	(Constantly tested knowledge) 3
	(Oral exam) 2
Remark	This course can not be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have passed Matematika I
	students cannot enroll in this course unless they have passed Nacrtha geometrija u graditeljstvu l
	Students cannot enroll in this course unless they have completed Osnove geologije
	22245-20070-147420-
isvo equivalents:	122343,33070,147420;

Code WEB/ISVU	23354/147434	ECTS	2.0	Academic year	2018/2019			
Name	Introduction to Physical	Planning						
Status	6th semester - Building and traffic infrastructure (Redovni graditeljstvo) obligatory course	Construction (Redovni e) (Redovni graditeljstvo - obligatory course6th s	graditeljstvo) - obligatory o) - obligatory course6th emester - Civil and Envir	y course6th semester - C semester - Managemen ronmental Engineering (F	ivil Engineering (Water t in Civil Engineering Redovni graditeljstvo) -			
Teaching mode	Lectures + exercises (a work at home	uditory + laboratory + :	seminar + metodology +	- construction)	30+0 (0+0+0+0) 30			
Teachers	Lectures:1. dr.sc. Draže	n Arbutina dipl.ing.arh.						
Course objectives	Introduction to basic principles of the urban and physical planning profession. Introduction to the theory of urban and physical planning, and to practical problems related to the planning and development of urban areas and larger areas (regions).							
Learning outcomes:	1.identify practical problems with regard to urban and physical planning). Level:6 2.generalize basic theoretical urban-planning and physical-planning assumptions). Level:6,7 3.check physical planning requirements during development of civil engineering projects. Level:6 4.define activities and necessary interdisciplinary work structure that have to be conducted during preparation and implementation of physical planning documents. Level:6,7 5.correlate basic specific features of historic development of towns, modern physical planning requirements and practical physical-planning problems with theoretical assumptions . Level:6,7 6.define necessary basic physical planning and legal activities based on construction and urban development regulations during preparation of physical planning documents. Level:6 7.generate basic urban development and general physical development requirements for mostly transport and water engineering infrastructure during cooperation in the development of physical planning documentation. Level:6,7							
Involvement of learning outcomes of the course in study programme:	6.5.0KUG NAPRAVITI jeo	dnostavnije troškovnike	i organizaciju te voditi g	građenje jednostavnih gra	ađevina: 5h in 60h			
Methods of carrying out lectures	Ex cathedra teaching Guest lecturer Case studies Discussion Questions and answers Seminar, students prese Homework presentation Other Each topic starts with th	entation and discussion	after which possible pra	ictical applications - back	ed by appropriate			
Lectures	1.Introductory theses - 1 professional relationshij 2.Development of towns I 3.Man and space. Proce outcomes:1,2,3,4 4.Geographic conditions outcomes:1,2,3,4,7 Transport, its significan 5.Industry and industria Tourism and its influenc 6.Agricultural and fores Environmental impacts. 7.Protection of space. A outcomes:1,2,3,4,5,7 Space management (sp services, etc.), 1h, Lear 8.Urban agglomeration, outcomes:1,2,3,4,5 Urban functions of town 9.Municipal infrastructu system management). Urban area aesthetics (i green spaces), 1h, Lear 10.Zagreb - urban probi 11.Town planning and c elaboration procedure, i cartographic data and p scales, graphics, prepar 12.Method and technolo Regional development p environment; activities 13.Town area regulation outcomes:2,3,4,5,6,7 Urban reconstruction ar 14.Detailed urban deve amenities), 1h, Learning Detailed urban develop transport corridor profil	Derinition of urban and os, interdisciplinarity in s I (Antiquity and the Mi I (Modern Age and press sses in space (Primary s for the establishment ce and transport-genera I areas, 1h, Learning out te on space, 1h, Learning out impacts in coastal area reas with special prope ace management instru- ning outcomes:1,4,7 conurbation and mega s, 1h, Learning outcomes: 1h, Learning outcomes: 1,4,7 conurbation and mega s, 1h, Learning outcomes ing outcomes:1,2,3,4 lems; synthesizing inter ivil engineering regulat subjects participating ir blan types (survey docu ation procedure, and aj ogy for preparation of p olan (level: state, counti in space; population), 1 n (functional town zonin and renewal of urban her lopment plan I - Resider g outcomes:2,3,4,5,6,7 ment plan II - Transport e, parking, public transf	physical planning (space planning), 2h, Learning (ddle Ages), 1h, Learning ent-day urbanism), 1h, L and secondary urbanisat and development of tow ated opening to other are itcomes:1,2,3,4,5,7 g outcomes:1,2,3,4,5,7 comes:1,2,3,4,7 as, 1h, Learning outcome rties: natural reserves, n uments, real property ow lopolis. Region. Homoge es:1,2,3,4 frastructure facilities, mu 1,2,3,4 lic space in urban areas pretation and discussion ions (laws, administrativ plan elaboration), 1h, L emnts, cadastre, GIS, et oproval), 1h, Learning ou hysical plans, 1h, Learnin	e, town, physical planning outcomes:2 g outcomes:2,3 cearning outcomes:2,3 tion, village, town), 2h, Li ns and population growti eas, 1h, Learning outcom es:1,2,3,4,5,7 nemorial parks and natio unership, land rent, contr neous, polarised, admini unicipal level hygiene, mu with improvement and e n, 2h, Learning outcomes re documents, technical of earning outcomes:2,3 c., hierarchy of spatial an utcomes:1,4,5 m of settlements; transp 3,4,6,7 ix, microurban elements a sociology, 1h, Learning ividual housing zones, co ansport terminals, urban b, 1h, Learning outcomes	earning h, 1h, Learning hes:1,2,3,4,5,7 nal parks, 1h, Learning ibution for utility strative, 1h, Learning unicipal zones, municipal equipment, parks and :1,2,3,4,5 documentation, plan hd urban plans; types, ort system, natural), 1h, Learning outcomes:2,3,4,6,7 illective housing zones, transport network, :2,3,4,5,6,7			

	15.Ruralism - planning and development of rural settlements and spaces; Environmental protection in physical and urban planning (fire, earthquake, floods, landslides, war, noise, pollution), 1h, Learning outcomes:2,3,4 Practical problems during preparation and implementation of physical plans, 1h, Learning outcomes:1,3,5,6,7
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Overhead projector Portable overhead projector Video equipment
Exam literature	 Basic literature: 1.B.Milić: "Razvoj grada kroz stoljeća I - III", Zagreb, 19942002.; 2.S.Pegan: Urbanizam - Uvod u detaljno urbanističko planiranje, Arhitektonski fakultet Sveučilišta u Zagrebu, 2007. 3.N. Lipovac: "Uvod u zakonodavstvo prostornog uređenja", Arhitektonski fakultet Sveučilišta u Zagrebu, 2012. 4.N. Lipovac: "Stručna metodologija izrade dokumenata prostornog uređenja", Tehničko veleučilište u Zagrebu, Zagreb, 2010. 5.A.Marinović-Uzelac: "Prostorno planiranje",Dom i svijet, Zagreb 2001. 6.A. Marinović-Uzelac: "Naselja, gradovi, prostori", Tehnička knjiga, Zagreb, 1986 4) M. Vresk: "Grad u urbanom i regionalnom planiranju", Zagreb, 1990. Additional literature: 7.L. MUMFORD: Grad u historiji, Zagreb, 1988.; 8.Marinović-Uzelac, A.; Socijalni prostor grada, Zagreb, 1978.; 9.Marinović-Uzelac, A.; Teorija namjene površina u urbanizmu, Zagreb, 1989.; 10.M. Maretić: "Gradski centri", Školska knjiga, Zagreb, 1996. 11.M. Vresk: Grad i urbanizacija, Školska knjiga, Zagreb, 2002. 12.Čaldarović, O.; Urbana sociologija, Zagreb, 1985.;
Students obligations	Class attendance - measured as a minimum presence on 75% of the classes and one short proficiency tests positively evaluated
Knowledge evaluation during semester	During the semester, students will have short proficiency tests and other methods of their work evaluation (short assessment or short proficiency tests are possible on each of the classes, before or after the end of the presentation, as well as individual and group presentations and analysis of smaller student seminar tasks, with a record of students activities during discussion). During the semester two major colloquiums are planned.
Knowledge evaluation after semester	The final examination consists of the written part of of the test (including written and graphical) and the oral examination.
Student activities:	Aktivnost ECTS (Written exam) 1 (Oral exam) 1
Remark	This course can not be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have passed Matematika II Students cannot enroll in this course unless they have passed Proračun konstrukcija

Code WEB/ISVU	22879/22330	ECTS	2.0	Academic year	2018/2019		
Name	Introduction to Railway	S			-		
Status	5th semester - Building	Construction (Redovni	graditeljstvo) - obligatory	/ course5th semester - C	ivil Engineering (Water		
	and traffic infrastructur	e) (Redovni graditeljstvo) - obligatory course5th	semester - Management	: in Civil Engineering		
	obligatory course	- obligatory coursestin si	emester - Civil and Envir	onnentai Engineening (r	(euoviii grauiteijstvo) -		
Teaching mode	Lectures + exercises (a	uditory + laboratory + s	eminar + metodology +	- construction)	30+0 (0+0+0+0)		
5	work at home	, ,	5,		30		
Teachers	Lectures:1. mr.sc. Ante	Goran Bajić viši predava	ač				
Course objectives	Students will acquire theoretical, practical and operative knowledge about the construction and maintenance of						
Loorning outcomos	railways and railway sy	stems, and will visit maj	railway transport Lovel	ites, plants and facilities	•		
Learning outcomes:	2.establish similarities	and differences between	traditional tracks and c	ontinuous welded rail tra	icks. Level:6		
	3.identify basic elemen	ts of railways, demonstr	ate practical knowledge	in the construction and	maintenance of		
	railways. Level:6,7						
	4.identify special struct	ures in the track (turnou	its) types, differences ar	id problems in use. Leve	1:0		
	Level:6	lateral acceleration, sup	erelevation in curves, ar		is in clansicion curves.		
Methods of carrying	Case studies						
out lectures	Discussion						
	Other						
	Theoretical lectures du	ring which appropriate to	eaching aids are used (s	lide projector, overhead	projector and video		
	recorder), and visit of n	najor railway constructio	n sites and plants.				
Course content	1.Introduction and gene	eral properties of railway	s. Transport. Transporta	tion facilities (classificat	ion). Historic		
lectures	of railways Type of trac	tion Principal character	ays. Loading gauge. Rail	hortcomings) steam loc	m geometry. Rentability		
	locomotive, and diesel	locomotive , 1h, Learnin	g outcomes:1	norceonnings), stearn rock	Shidive, ciccure		
	2.Railway elements: (cl	assification of railways,	track width, number of t	racks, organization of tra	affic on a single track		
	line and double track line	ne, horizontal curve, ver	tical alignment, maximu	m longitudinal grade). Tr	rain stations		
	3. Forces acting on the	track (static and dynam	ic - vertical and horizont	al), (1) Permanent way e	ements: 1. Rails:		
	Production. Marks. Qua	lity of steel. Types. Rail	wear , 1h, Learning outc	omes:2,3,4			
	4. 2. Rail accessories: F	astening accessories. Pr	oblems. Structural solut	ions (Germany, France, I	England). Connection		
	accessories. Glued insu	llating joint. Small acces	sories. Safety caps. Rail	travel blocking devices ,	2h, Learning		
	5. Sleepers: Steel sleep	ers. Advantages and she	ortcominas. Reinforced-o	concrete sleepers. Advar	itages and		
	shortcomings. Wooden	sleepers. Advantages ar	nd shortcomings. Fabrica	ation, durability, and pro	tection, 1h, Learning		
	outcomes:2,3	viene dimensione Thisler	na Matariala Dallast C	wain aire and shane. Can	tomination. Companing		
	b.Ballast: Objectives. Pl 2h. Learning outcomes	rism almensions. Thickni •2 3	ess. Materials. Ballast. G	rain size and shape. Con	tamination. Screening,		
	7.Special track accesso	ries (points, turntables,	travelling platforms, tria	ngles), 2h, Learning out	comes:4		
	8.First - preliminary exa	am, 2h					
	9. Track layout in straig	ht line and in curve. (Transition rates)	ack in straight line - widt	h, height, direction, regulation, regulation in the second se	Ilations. Track in curve.		
	for track superelevation	n 2h. Learning outcome	s:4				
	10.Track orientation - r	egulations. Direction arr	ows. Rectification metho	ds for horizontal curves.	Three-point method,		
	3h, Learning outcomes	:2,3	ation of individual allows				
	Learning outcomes 2.3	ntrol of geometry. Inspe	ction of individual eleme	ents. General inspection	of the track, 3h,		
	12.Track works and sys	temisation of works. Reg	gular. Seasonal. Occasio	nal. Big works (overhaul	s) - Railway repair shed		
	organization and schen	natic representation, 3h,	Learning outcomes:2,3				
	13.Repair of track subs	tructure. Replacement ti	rain. Track maintenance	works. Track welding. A	F weld. ET weld.		
	14.Continuous welded	rail: Advantages. Tempe	rature and forces in cont	, tinuous rail. Longitudinal	resistance - p. Lateral		
	resistance - w. Alleviati	ng internal stress from c	ontinuous rails. Three st	ress alleviation methods	(track pre-lifting), 2h,		
	Learning outcomes:2						
	15.Second - final prelim	nnary exam, Zh					
Required materials	Basic: classroom, black	board, chalk					
	Whiteboard with marke	ers					
	Overhead projector	octor					
	Video equipment	ector					
Exam literature	Basic literature:						
	1. Stipetić, A.: Gornji us	stroj željezničkoga kolosi	jeka, FPZ, Zagreb, 2008.				
	12. POllak, B.: ZELJEZNIC 3. Bajić, A G · Separati	.E, Grauevinski institut, F predavanja	שב, במעופט, 1988.				
	Additional literature:						
	1. P-314 PRAVILNIK O G	ORNJEM USTROJU, Hrva	tske željetnice, Zagreb				
Students obligations	maximum of 3 absence	s from exercises	ine zeijezilice, zayred				
Knowledge	Redovitost pohaa#5#0	#40\$Kolokvij, teoriiska i	oitanja#2#100#60\$				
evaluation during		, <u>, ,</u> ,	,				

semester					
Knowledge evaluation after semester	written part of the examinations (theory - 10 questions), oral part of the examination (may be taken only by students who acquired at least 60 points during the written part of the examination)				
Student activities:	Aktivnost (Classes attendance)	ECTS 2			
Remark	This course can not be used for final	thesis theme			
Prerequisites:	students cannot enroll in this course unless they have passed Proračun konstrukcija Students cannot enroll in this course unless they have passed Matematika II Students cannot enroll in this course unless they have passed Nacrtna geometrija u graditeljstvu II				

Code WEB/ISVU	23276/143316	ECTS	1.0	Academic year	2018/2019		
Name	Kinesiology Education I						
Status	1st semester - Undergraduate professional study in civil engineering (Redovni graditeljstvo) - obligatory course						
Teaching mode	Lectures + exercises (a	auditory + laboratory + s	seminar + metodology +	construction)	0+30 (30+0+0+0)		
	work at home				0		
Teachers	Auditory exercises: 1. Natalija Spenar visi predavač						
Course objectives	Students will acquire ki	nowledge about the basi	c bio-psycho-social huma	an need for dynamic exp	ression and movement,		
	motoric and cognitive of	canabilities conative pro	perties and morphologic	features) and about in	provement and		
	preservation of health a	and working capacity.	percies, and morphologic		iproveniene unu		
Learning outcomes:	1.demonstrate proper realization of technical elements in a sports activity. Level:6,7						
	2.explain basic terms r	elating to a particular sp	orts activity. Level:				
	3.formulate basic rules	relating to a particular s	ports activity. Level:				
	5.explain significance c	of warming up and stretc	hing in the course of a si	ports activity. Level:			
	6.describe organisation	1 and conduct of student	sporting events. Level:	,			
	7.consider significance	of a lifelong regular phy	sical activity. Level:				
Methods of carrying	Workshop Physical Education Exe	rcisos					
exercises		101303					
Course content	1.Repeating technical e	elements of a specific kir	esiologic activity, 4h, Le	arning outcomes:1			
auditory	2.Repeating technical e	elements of a specific kin	nesiologic activity, 2h, Le	arning outcomes:2			
	3.Adopting new elemer	nts of a specific kinesiolo	gic activity, 2h, Learning) outcomes:1			
	4.Adopting new elemer	Its of a specific kinesiolo	gic activity, 2n, Learning	i outcomes:2 ecific kinesiologic activity	v 2h Learning		
	outcomes:4	iementary games in the	rearining process of a spe		, zn, couning		
	6.Improving the element	nts of a specific kinesiold	ogic activity, 2h, Learning) outcomes:1			
	7.Improving the element	nts of a specific kinesiolo	gic activity, 2h, Learning) outcomes:2	-		
	8.Adopting a set of war	m-up exercises for a spe	CIFIC KINESIOLOGIC ACTIVITY	7, 2h, Learning outcomes ty 2h, Learning outcomes	3:5 ac •5		
	10.Repeating the basic	rules of a specific kinesi	ologic activity, 2h. Learn	ing outcomes:3	5.5		
	11.Adoption of basic te	chnical and tactical elem	nents of a specific kinesion	ologic activity, 2h, Learn	ing outcomes:1		
	12.Adoption of basic te	chnical and tactical elem	nents of a specific kinesio	ologic activity, 2h, Learn	ing outcomes:3		
	13.Competition and Ga	mes, 2h, Learning outco	mes:6				
	15.Training and automa	ation of injury preventior	nes.o 1 exercises. 2h. Learning	outcomes:7			
	<u>-</u>						
Required materials	Special equipment						
Fuene literature	Gym / pool and equipm	ient needed for each spo	ort activity (balls, rackets	, markers)			
Exam literature	Nema obvezne literatur	re budući da se ispit iz ti	elesne i zdravstvene kult	ure ne polaže. Studente	se upućuje na		
	literaturu vezanu uz tje	lesnu i zdravstvenu kulti	uru, poboljšanje i očuvan	ije zdravlja, pravilnu prel	hranu, prevenciju		
	nastanka ozljeda, povij	est sporta, pravila sporta	a, načine i ciljeve trening	a, važnost redovitog vje	žbanja tjekom cijelog		
	života, novosti u svijeti Additional literaturoj	i sporta, rekreacije i kine	ziterapije.				
	1.Mišigoi-Duraković. M.	. i sur. (1999). Tielesno v	iežbanie i zdravlie. Zagre	eb: FFK			
	2.Anderson, B., E. Burk	e, B. Pearl (1997.). Fitne	ss za sve, Zagreb: Gopal				
	3.Anderson, B. (2001.).	Stretching. Zagreb: Gop	pal.				
	4.Clark, N. (2000). Spor	rtska prehrana. Zagreb: (Gopal. W Paris, Human Kinotics				
	5.Delavier, F. (2001). 5 6 Dick F W (1997) Sr	orts Training Principles	Jondon A C Black				
	7.Ellis J., J. Henderson (1997.).Trčanje bez ozlje	da, Zagreb: Gopal.				
	8.Jukić, I., Marković. G.	(2005.). Kondicijske vjež	be s utezima. Zagreb. Ki	neziološki fakultet Sveu	čilišta u Zagrebu		
	9.Klinika za dječje bole	sti Zagreb, Služba za rep	produktivno zdravlje (200	0). Spolno prenosive bo	lesti, Reproduktivno		
	10.Klinika za diečie bol	esti Zagreb. Služba za re	ce, Zagreb. produktivno zdravlie (20	01). Kontracepcija - vod	ič kroz metode i		
	sredstva za spriječavar	nje trudnoće, Zagreb.					
	11.Kulier, I (2003). Stra	itegija mršavljenja, Zagre	eb: Impress.				
	12.Kulier, I. (2001). Sto	jedemo, Zagreb: Impres	S.				
	13.Medved, R. I suradn 14 Milanović D i surad	ici (1987). Sportska med inici (1997). Priručnik za	sportske trenere. Zagreb:	o. FEK			
	15.Mišigoj-Duraković, M	4., i suradnici (1995). Mo	rfološka antropologija u	športu. Zagreb. FFK			
	16.Pearl, B. (1994.). Ge	etting stronger, Kalifornija	a, Bolinas: Shelter Public	ations. Inc.			
	17. Spehar, N. (2014).	Tjelesna aktivnost u funk	ciji zdravlja - nastavni m	aterijal iz Tjelesne i zdra	ivstvene		
	Chavijesti i informacije	e na web stranicama 1 VZ	i-a //nastava tvz hr/tzk-GBO				
Students obligations	Students are required t	to actively participate in	exercises during 30 hour	rs per semester, during f	our semesters. First		
ga	semester students mus	st go through the swimm	ing test (non-swimmers	have to attend the swim	ming school during the		
	second semester). Seco	ond semester students m	nust be present at both le	ectures and exercises. S	tudents who are not		
	required to attend beca	ause of active participation	on in sports are however	required to attend all le	ctures, assist in the		
	doctor.	mentation of lectures, ar	iu acteriu a specially dev	ised program if permitte	u to do so by the sports		
Knowledge	Redovitost pohaa#18#						
evaluation during							
semester							
	1						



Knowledge evaluation after semester	Students are required to actively participate in exercises during 30 hours per semester, during four semester. First semester students must go through the swimming test (non-swimmers have to attend the swimming school during the second semester). Students not required to attend because of active participation in sports are however required to attend all lectures, assist in organization and implementation of lectures and attend a specially devised program if permitted to do so by the sports doctor.					
Student activities:	Aktivnost	ECTS				
	(Classes attendance)	1				
Remark	This course can not be used for final	thesis theme				
Prerequisites:	No prerequisites.					
ISVU equivalents:	38171;85288;	38171;85288;				
Proposal made by	Natalija Špehar, Senior Lecturer					

Code WEB/ISVU	23277/143317	ECTS	1.0	Academic year	2018/2019		
Name	Kinesiology Education I						
Status	2nd semester - Underg	raduate professional stu	dy in civil engineering (R	edovni graditeljstvo) - o	bligatory course		
Teaching mode	Lectures + exercises (a	auditory + laboratory + s	seminar + metodology +	construction)	0+30 (30+0+0+0)		
	work at home				0		
Teachers	Auditory exercises: 1. Natalija Spenar visi predavac						
Course objectives	Students will acquire ki	nowledge about the basi	c bio-psycho-social huma	an need for dynamic exp	ression and movement,		
	motoric and cognitive of	canabilities conative pro	perties and morphologic	c features) and about in	accensuics (functional,		
	preservation of health	and working capacity.	percies, and morphologic		iproveniene und		
Learning outcomes:	1.demonstrate correct performance of technical elements in individual sports activities. Level:						
	2. select exercises for individual muscle groups. Level:						
	3.distinguish between t	training methods for Indi	vidual motoric and funct	ional capabilities. Level:	0 Vel:6 7		
	5.explain basic health l	benefits of regular physic	cal exercise. Level:	gical characteristics. Le	vei.0,7		
	6.make a distinction between nutrients and their role in the organism. Level:6						
	7.explain basic connect	tion between physical ex	ercises and body volumi	nosity. Level:			
Methods of carrying	Workshop Physical Education Exe	rcisos					
exercises		101505					
Course content	1.Repeating technical e	elements of a specific kir	esiologic activity, 2h, Le	arning outcomes:1			
auditory	2.Repeating technical e	elements of a specific kir	nesiologic activity, 2h, Le	arning outcomes:1			
	3.Adopting new elemer	nts of a specific kinesiolo	gic activity, 2h, Learning	j outcomes:1			
	4.Adopting new elemer	its of a specific kinesiolo	gic activity, 2n, Learning	0utcomes:1			
	6.Adopting a set of exe	rcises for each muscle g	roup, 2h, Learning outco	mes:2			
	7.Establishing the rules	s of a specific kinesiologi	c activity, 2h, Learning o	utcomes:6			
	8.Adopting different tra	aining methods , 2h, Lear	rning outcomes:3				
	9.Adopting different tra	ining methods , 2h, Leai	ning outcomes:3	arning outcomes:/			
	11.Training of injury pr	evention exercises , 2h,	Learning outcomes:5	arming outcomes.4			
	12.Adoption of basic te	chnical and tactical elem	nents of a specific kinesion	ologic activity, 2h, Learn	ing outcomes:6		
	13.Adoption of basic te	chnical and tactical elem	nents of a specific kinesio	ologic activity, 2h, Learn	ing outcomes:6		
	14.Competition and Ga	mes, 2h, Learning outco	mes: /				
	15.Competition and Ga	ines, zn, Leanning outco	11105.7				
Required materials	Special equipment						
	Gym / pool and equipm	ent needed for each spo	ort activity (balls, rackets	, markers)			
Exam literature	Basic literature:	//			<i>,</i> .		
	literaturu vezanu uz tie	re buduci da se ispit iz tji Jesnu i zdravstvenu kulti	elesne i zdravstvene kult	ure ne polaze. Studente	se upucuje na branu, prevenciju		
	nastanka ozlieda, povij	est sporta, pravila sporta	a. načine i cilieve trening	a. važnost redovitog vie	žbania tiekom ciielog		
	života, novosti u svijetu	u sporta, rekreacije i kine	ziterapije.	, · · · · · · · · · · · · · · · · · · ·			
	Additional literature:				·····		
	1. JUKIC, I., Markovic. G. 2 Anderson B (2001)	(2005.). Kondicijske vjez	zbe s utezima. Zagreb. Ki	inezioloski fakultet Sveu	cilista u Zagrebu		
	3.Clark, N. (2000). Spor	rtska prehrana. Zagreb: /	Gopal.				
	4.Čorak, N. (2001.). Fitr	ness Bodybuilding, Zagre	eb: Hinus.				
	5.Delavier, F. (2001). S	treinght training anatom	y. Paris. Human Kinetics				
	6.DICK, F. W. (1997). Sp 7 Ellis I. J. Hondorson (orts Training Principles.	London. A C Black.				
	8.Klinika za diečie bole	sti Zagreb. Služba za rec	produktivno zdravlie (200)0). Spolno prenosive bo	lesti. Reproduktivno		
	zdravlje, Metode i sred	stva za zaštitu od trudno	iće, Zagreb.				
	9. Klinika za dječje bole	esti Zagreb, Služba za rej	produktivno zdravlje (20	01). Kontracepcija - vodi	č kroz metode i		
	Sredstva za sprijecavar	ije trudnoce, Zagreb. Ategija mršavljenja - Zagr	oh: Impross				
	11.Kulier, I. (2003). Što	iedemo. Zagreb: Impres	55.				
	12.Medved, R. i suradn	ici (1987). Sportska med	licina. Zagreb: Jumena.				
	13.Milanović, D. i surad	Inici (1997). Priručnik za	sportske trenere. Zagreb	o: FFK			
	14.Mišigoj-Duraković, M 15. Mičigoj Duraković, N	4. i sur. (1999). Tjelesno 4. i suradnici (1005). Ma	vježbanje i zdravlje. Zag	reb: FFK			
	16.Pearl. B. (1994.). Ge	etting stronger. Kalifornii	a. Bolinas: Shelter Public	ations. Inc.			
	17. Špehar, N. (2014).	Tjelesna aktivnost u funk	ciji zdravlja - nastavni m	naterijal iz Tjelesne i zdra	ivstvene		
	kulture,dostupno online	e na web stranicama TVZ	<u>′</u> -a				
	Obavijesti i informacije	na internet adresi http:/	/nastava.tvz.hr/tzk-GRO				
Students obligations	Students are required t	to actively participate in	exercises during 30 hour	rs ner semester during f	our semesters First		
Students obligations	semester students mus	st go through the swimm	ing test (non-swimmers	have to attend the swim	ming school during the		
	second semester). Seco	ond semester students n	nust be present at both l	ectures and exercises. S	tudents who are not		
	required to attend beca	ause of active participation	on in sports are however	required to attend all le	ctures, assist in the		
	organization and imple	mentation of lectures, ar	nd attend a specially dev	ised program if permitte	ed to do so by the sports		
Knowledge	Redovitost nobaa#18#	100#0\$Prakti rad#10#0	0#0\$				
evaluation during		100#0011000100	<i>)#</i> 0 <i>4</i>				
semester							
	1						



Knowledge evaluation after semester	Students are required to actively participate in exercises during 30 hours per semester, during four semester. First semester students must go through the swimming test (non-swimmers have to attend the swimming school during the second semester). Second semester students must be present both at lectures and at exercises. Students not required to attend because of active participation in sports are however required to attend all lectures, assist in organization and implementation of lectures and attend a specially devised program if permitted to do so by the sports doctor.					
Student activities:	Aktivnost ECTS					
	(Classes attendance)					
Remark	This course can not be used for final thesis theme					
Prerequisites:	Students cannot enroll in this course unless they have enrolled Kineziološka kultura I					
ISVU equivalents:	22363;38172;85289;					
Proposal made by	Natalija Špehar, Senior Lecturer					

Code WEB/ISVU	23278/143318	ECTS	1.0	Academic year	2018/2019			
Name	Kinesiology Education III							
Status	3rd semester - Undergraduate professional study in civil engineering (Redovni graditeljstvo) - obligatory course							
Teaching mode	Lectures + exercises (a	auditory + laboratory + s	eminar + metodology +	construction)	0+30 (30+0+0+0)			
	work at home				0			
Teachers	Auditory exercises:1. Natalija Spenar visi predavac							
Course objectives	Students will acquire kr	nowledge about the basi	c bio-psycho-social huma	an need for dynamic exp	ression and movement,			
	motoric and cognitive c	canabilities conative pro	perties and morphologic	features) and about im	incovement and			
	preservation of health a	and working capacity.						
Learning outcomes:	1.demonstrate correct p	1.demonstrate correct performance of technical elements in individual sports activities. Level:						
	2.explain purpose of tag	ctical elements in individ	lual sports activities. Lev	el:				
	3.give an example of th	he way in which student	sports competitions shou	and be organized. Level:				
	5.explain possibilities for	or participation in recrea	tional and sporting activ	ities in Croatia. Level:				
	6.give an example of ho	ow to conceive a person	al training program for a	week/month/year. Level	:			
	7.describe how to succe	essfully provide a first ai	d assistance in case of a	n injury during a sports a	activity. Level:			
	Mandard and							
Methods of carrying	Worksnop Physical Education Exer	rcises						
exercises		101505						
Course content	1.Improving the technic	cal elements of a specific	c kinesiologic activity., 2	h, Learning outcomes:1				
auditory	2.Improving the technic	cal elements of a specific	kinesiologic activity, 2h	, Learning outcomes:1				
	3.Establishing the rules	of a specific kinesiologi	c activity., 2h, Learning o	outcomes:2				
	4.Establishing the rules	of a specific kinesiologi	c activity, 2h, Learning o ments of a specific kines	utcomes:2 jologic activity 2h Lear	ning outcomes:1			
	6.Improving the basic to	echnical and tactical ele	ments of a specific kines	iologic activity, 21, Lean	ning outcomes:1			
	7.Game systems and ta	actics of a specific kinesi	ologic activity., 2h, Learr	ning outcomes:2	5			
	8.Game systems and ta	actics of a specific kinesi	ologic activity., 2h, Learr	ning outcomes:2				
	9. Leam leadership, offic	ciating, organization of c	competitions., 2h, Learnii	ng outcomes:3	outcomos:4			
	11.Learning and applica	ation of a specific kinesio	plogic activity for the pur	pose of independent red	ular exercise during			
	free time., 2h, Learning	outcomes:5	,		, , , , , , , , , , , , , , , , , , ,			
	12.Learning and applica	ation of a specific kinesio	ologic activity for the pur	pose of independent reg	ular exercise during			
	free time., 2h, Learning) outcomes:6 os for oach musclo group	for the provention of oc	cupational injuries 2h	learning outcomes:7			
	14.Strength and mobilit	ty exercises for the prev	ention of injuries. First ai	d., 2h. Learning outcom	es:7			
	15.Basic characteristics	s of different kinesiologic	activities and their impa	act on anthropological ch	aracteristics., 2h,			
	Learning outcomes:4							
Boguirod motorials	Devoiced Education Ever	reicoc						
Evam literature		TCISES						
	1. Nema obvezne literature budući da se ispit iz tjelesne i zdravstvene kulture ne polaže. Studente se upućuje na							
	literaturu vezanu uz tjelesnu i zdravstvenu kulturu, poboljšanje i očuvanje zdravlja, pravilnu prehranu, prevenciju							
	nastanka ozljeda, povije	est sporta, pravila sporta	a, načine i ciljeve trening	a, važnost redovitog vjež	źbanja tjekom cijelog			
	zivota, novosti u svijetu Additional literature:	i sporta, rekreacije i kine	ziterapije.					
	1.Anderson, B., E. Burke	e, B. Pearl (1997.). Fitne	ss za sve, Zagreb: Gopal					
	2.Anderson, B. (2001.).	Stretching. Zagreb: Gop	oal.					
	3.Clark, N. (2000). Spor	rtska prehrana. Zagreb:	Gopal.					
	4.Corak, N. (2001.). Fitr 5 Dolavior E (2001) St	ness Bodybuilding, Zagre troinght training anatom	eb: Hinus. V. Paris, Human Kinotics					
	6.Dick. F. W. (1997). Sp	orts Training Principles.	London. A C Black.	•				
	7.Ellis J., J. Henderson (1997.).Trčanje bez ozljeo	da, Zagreb: Gopal.					
	8.Jukić, I., Marković. G.	(2005.). Kondicijske vjež	be s utezima. Zagreb. Ki	neziološki fakultet Sveu	ćilišta u Zagrebu			
	9.Klinika za djecje boles zdravlje. Metode i sreds	sti Zagreb, Sluzba za rep stva za zaštitu od trudno	roduktivno zdravlje (200 će: Zagreb	0). Spolno prenosive bol	esti, Reproduktivno			
	10.Klinika za dječje bole	esti Zagreb, Služba za re	produktivno zdravlje (20	01). Kontracepcija - vod	ič kroz metode i			
	sredstva za spriječavan	nje trudnoće, Zagreb.		,				
	11.Kulier, I (2003). Strat	itegija mršavljenja, Zagro	eb: Impress.					
	12.Kuller, I. (2001). Sto 13 Medued P. i suradni	jedemo, Zagreb: Impres	isina Zagrob: lumona					
	14.Milanović, D. i surad	lnici (1997). Priručnik za	sportske trenere. Zagreb	o: FFK				
	15.Mišigoj-Duraković, M	I. i sur. (1999). Tjelesno	vježbanje i zdravlje. Zag	reb: FFK				
	16.Mišigoj-Duraković, M	1., i suradnici (1995). Mo	rfološka antropologija u	športu. Zagreb. FFK				
	17.Pearl, B. (1994.). Ge 18 Špobar N. (2014) 1	tting stronger, Kalifornija Tiologna aktivnost u funk	a, Bolinas: Sneiter Public vciji zdravlja – pastavni m	ations. Inc. Jatorijal iz Tiolocno i zdra	wetwono			
	kulture.dostupno online	e na web stranicama TVZ	2-a		vstvene			
	Obavijesti i informacije	na internet adresi http:/	/nastava.tvz.hr/tzk-GRO					
		_						
Students obligations	maximum of 3 absence	es trom exercises						
Knowledge	Redovitost pohaa#18#	100#0\$Prakti rad#10#0	J#U\$					
semester								
Knowledge	Students are required t	o actively participate in	exercises during 30 hour	rs per semester, durina f	our semester. First			
evaluation after	semester students mus	st go through the swimm	ing test (non-swimmers	have to attend the swim	ming school during the			
I	I							

semester	second semester). Second semester students must be present both at lectures and at exercises. Students not required to attend because of active participation in sports are however required to attend all lectures, assist in organization and implementation of lectures and attend a specially devised program if permitted to do so by the sports doctor.					
Student activities:	Aktivnost ECTS					
	(Classes attendance) 1					
Remark	This course can not be used for final thesis theme					
Prerequisites:	Students cannot enroll in this course unless they have passed Kineziološka kultura l					
ISVU equivalents:	38173;85290;					
Proposal made by	Natalija Špehar, Senior Lecturer					

Code WEB/ISVU	23279/143319	ECTS	1.0	Academic year	2018/2019		
Name	Kinesiology Education	IV					
Status	4th semester - Undergraduate professional study in civil engineering (Redovni graditeljstvo) - obligatory course						
Teaching mode	Lectures + exercises (a	auditory + laboratory + s	eminar + metodology +	construction)	0+30 (30+0+0+0)		
Taaabawa	work at nome	latalija Čnahovujži predo	X		0		
Teachers	Fugence will acquire knowledge about the basis big psychological human pood for dynamic overgosion and meyoment						
Course objectives	benefits of regular phy	sical exercise during the	entire lifetime, influence	on anthropological cha	racteristics (functional.		
	motoric and cognitive of	capabilities, conative pro	perties, and morphologi	c features), and about in	nprovement and		
	preservation of health	and working capacity.	· · · ·		·		
Learning outcomes:	1.demonstrate correct	performance of technica	l elements in individual	sports activities. Level:			
	2.explain purpose of ta	ctical elements in individ	lual sports activities. Lev	/el: ports compotitions ovo'	1.		
	4.explain significance (of lifelong healthy diet an	id regular exercise. Leve	i: د د د د د د د د د د د د د د د د د د د	1.		
	5.give an example of h	ow to conceive a persona	al training program for a	week/month/year. Leve	4:		
	6.define professional m	nusculoskeletal system di	iseases of persons empl	oyed in construction ind	ustry. Level:6		
	7.explain significance of	of physical activity in the	prevention of profession	nal musculoskeletal syste	em diseases of persons		
	employed in constructi	on industry. Level:					
Methods of carrying	Workshop						
out auditory							
exercises							
Course content	1.Adopting and improv	ing the technical elemen	ts of a chosen kinesiolog	gic activity, 2h, Learning	outcomes:1		
auditory	2.Adopting and improv	ing the technical element	ts of a chosen kinesiolog	Jic activity, 2h, Learning	outcomes:1		
	4 Improving the techni	cal and tactical elements	of a specific kinesiologi	c activity, 2n, Learning c	outcomes:2		
	5.Establishing the rules	s of a specific kinesiologic	c activity, 2h, Learning c	outcomes:2			
	6.Establishing the rules	s of a specific kinesiologic	c activity, 2h, Learning c	outcomes:2			
	7.Analysis and method	s of teaching a specific k	inesiologic activity, 2h, l	_earning outcomes:4	luning (as the 2b		
	8. Application of a speci	inc kinesiologic activity in	or the purpose of indepe	indent regular exercise c	juring free time., 2h,		
	9.Application of a spec	ific kinesiologic activity for	or the purpose of indepe	endent regular exercise o	during free time., 2h,		
	Learning outcomes:4			-			
	10.Team leadership, of	ficiating, organization of	competitions, 2h, Learn	ing outcomes:3			
	11. Training structure (content and organization) of a specific kinesiolog	ic activity, 2h, Learning (outcomes:3		
	13.Selection of exercise	es for each muscle group) for the prevention of or	cupational injuries. 2h.	Learning outcomes:7		
	14.Basic characteristic	s of different kinesiologic	activities and their imp	act on anthropological cl	haracteristics, 2h,		
	Learning outcomes:6						
	15.Basic characteristics	s of different kinesiologic	activities and their imp	act on anthropological cl	haracteristics, 2h,		
	Learning outcomes.o						
Required materials	Special equipment						
	Gym, swimming pool						
Exam literature	Basic literature:	/					
	Nema obvezne literatu	re budući da se ispit iz tje Jospu i zdravstvopu kulti	elesne i zdravstvene kuli uru, poboličanje i očuvar	ture ne polaže. Studente pie zdravlja, pravilnu pre	e se upućuje na branu, provonciju		
	nastanka ozljeda, povij	jest sporta, pravila sporta	a, načine i ciljeve treninc	ja, važnost redovitog vje	žbanja tjekom cijelog		
	života, novosti u svijeti	u sporta, rekreacije i kine	ziterapije.	.,			
	Additional literature:						
	1.Pearl, B. (1994.). Get 2 Anderson B. (2001.)	ting stronger, Kalifornija, Strotching, Zagrob, Con	Bolinas: Shelter Publica	tions. Inc.			
	3.Clark, N. (2000). Spo	rtska prehrana. Zagreb: (Gopal.				
	4.Čorak, N. (2001.). Fit	ness Bodybuilding, Zagre	eb: Hinus.				
	5.Delavier, F. (2001). S	treinght training anatom	y. Paris. Human Kinetics				
	6.DICK, F. W. (1997). Sp 7 Ellis I. J. Henderson (oorts Training Principles.	London, A C Black.				
	8. lukić. I., Marković. G.	(2005.). Kondicijske viež	be s utezima. Zagreb. K	ineziološki fakultet Sveu	čilišta u Zagrebu		
	9.Klinika za dječje bole	sti Zagreb, Služba za rep	roduktivno zdravlje (200	0). Spolno prenosive bo	lesti, Reproduktivno		
	zdravlje, Metode i sred	stva za zaštitu od trudno	će, Zagreb.				
	10.Klinika za dječje bol gradstva za sprijočavar	esti Zagreb, Služba za re	produktivno zdravlje (20	001). Kontracepcija - vod	lić kroz metode i		
	11. Kulier, I (2003). Stra	ije truunoce, Zagreb. itegija mršavljenja, Zagre	eb: Impress.				
	12.Kulier, I. (2001). Što	jedemo, Zagreb: Impres	S.				
	13.Medved, R. i suradn	ici (1987). Sportska med	icina. Zagreb: Jumena.				
	14.Milanović, D. i surac	Inici (1997). Priručnik za	sportske trenere. Zagrel	D: FFK			
	15.Misigoj-Duraković, M 16 Mišigoj-Duraković	4. i suradnici (1999). Tjelesno Mi i suradnici (1995). Mo	vjezbanje i zdravije. Zag rfološka antropologija u	športu Zagreh FFK			
	17.Špehar, N. (2014). T	Fjelesna aktivnost u funko	ciji zdravlja - nastavni m	aterijal iz Tjelesne i zdra	vstvene		
	kulture,dostupno online	e na web stranicama TVZ	'-a				
	Obavijesti i informacije	na internet adresi http://	/nastava.tvz.hr/tzk-GRO				
Ctudonte obligatione	maximum of 2 abcong	- from oversions					
Students obligations	Redevitest pobaa#18#	t100#0¢Prakti rad#10#0)#0¢				
evaluation during		·100#0\$Flakti1au#10#t)#0p				
semester							



Knowledge evaluation after semester	second semester). Second semester students must be present both at lectures and at exercises. Students not required to attend the swimming test (non-swimmers have to attend the swimming school during the second semester). Second semester students must be present both at lectures and at exercises. Students not required to attend because of active participation in sports are however required to attend all lectures, assist in organization and implementation of lectures and attend a specially devised program if permitted to do so by the sports doctor.					
Student activities:	Aktivnost ECTS					
	(Classes attendance) 1					
Remark	This course can not be used for final thesis theme					
Prerequisites:	Students cannot enroll in this course unless they have passed Kineziološka kultura II					
ISVU equivalents:	32151;38174;85292;					
Proposal made by	Natalija Špehar, Senior Lecturer					

Code WEB/ISVU	23940/184753	ECTS	5.0	Academic year	2018/2019			
Name	Market and Business I	Invironment						
Status	4th semester - Undergraduate professional study in civil engineering (Redovni graditeljstvo) - elective course							
Teaching mode	Lectures + exercises (auditory + laboratory + seminar + metodology + construction) 30+30 (14+0+16+0) work at home 90							
Teachers	Lectures:1. mr.sc. Časlav Dunović , viši predavač Auditory exercises:mr.sc. Časlav Dunović , viši predavač Seminar exercises: Brigitta Cafuta Cominar exercises:mr.sc. Časlav Dunović , viši predavač							
Course objectives	The aim of the course	is to teach students to a	acquire theoretical know	ledge and practical skills	for the successful			
Learning outcomes	1 define basic notions	of economics for civil or		S OF INdikel and Dusiness	environment.			
Learning outcomes.	2.identify elementary reproduction processes. Level:6 3.categorize business funds. Level:6 4.connect company with its environment. Level:6,7 5.classify business results. Level:6,7 6.define factors that influence company operations. Level:6							
Methods of carrying out lectures	Ex cathedra teaching Discussion							
	Other Appropriate teaching during the course.	aids (video projector and	d computer) will be used	l to present, in an appropr	iate way, topics covered			
Methods of carrying out auditory	Group problem solving Discussion, brainstorn	g ning						
	Cases from real life ar	e analyzed, and instruct	ions are given as neces	sary for preparation of the	e seminar paper.			
Methods of carrying out seminars	Other The final result of aud relating to a particula	itory exercises is the ser r type of production.	minar paper. Every stud	ent independently prepare	es a seminar paper			
Course content lectures	1. Business environme 2. Economic developm 3. Technical structure 4. Company, entreprer 5. Notion of company a 6. Entrepreneurs, 2h, Le 7. Entrepreneurship, it 8. Company policies, e 9. Market, notion, func 10. Market research, s 11. Law of supply and 12. Reproduction flow, 13. Forms of investme 14. Costs and calculati 15. Business success a	nt, notion of earning, 2h ent indicators, factors ir of economy, 2h, Learnin heur, entrepreneurship, 1 and its functions, 2h, Lea earning outcomes:4 s meaning and role in cc stablishment of policies, tion, structure, 2h, Learn upply and demand, 2h, I demand, reproduction p input, output, 2h, Learn nt in reproduction, 2h, L ons, supply, sale, 2h, Le und business success ind	I, Learning outcomes:1 Ifluencing economic dev g outcomes:2,6 2h, Learning outcomes:2,4 arning outcomes:2,4 onstruction industry, 2h, influence factors, 2h, L ning outcomes:4 _earning outcomes:2,4 earning outcomes:2,5 earning outcomes:2,5 earning outcomes:3,5 licators, 2h, Learning ou	velopment, 2h, Learning or 4 Learning outcomes:4 earning outcomes:3,4 tcomes:2,5 tcomes:6	utcomes:2,4			
Course content auditory	1.A real practical case flow is established, co outcomes:2,4,5 2.A real practical case flow is established, co outcomes:2,4,5 3.A real practical case flow is established, co outcomes:2,4,5 4.A real practical case flow is established, co outcomes:2,4,5 5.A real practical case flow is established, co outcomes:2,4,5 6.A real practical case flow is established, co outcomes:2,4,5 7.A real practical case flow is established, co outcomes:2,4,5 8.A real practical case flow is established, co outcomes:2,4,5 9.A real practical case flow is established, co outcomes:2,4,5 9.A real practical case flow is established, co outcomes:2,4,5 10.A real practical case flow is established, co outcomes:2,4,5 10.A real practical case flow is established, co outcomes:2,4,5 11.A real practical case	is considered: the mark sts are analyzed, and el- is considered: the mark sts are analyzed, and el-	tet for products produce ements for the determin set for products produce ements for the determin rket for products produce ements for the determin	d by the company is analy nation of success are com- adiation of success are com-	yzed, the reproduction mented on., 1h, Learning yzed, the reproduction mented on., 1h, Learning ilyzed, the reproduction			

	flow is established, costs are analyzed, and elements for the determination of success are commented on., 1h, Learning
	outcomes:2,4,5
	12.A real practical case is considered: the market for products produced by the company is analyzed, the reproduction flow is established, costs are analyzed, and elements for the determination of success are commented on., 1h, Learning outcomes: 2.4.5
	13.A real practical case is considered: the market for products produced by the company is analyzed, the reproduction flow is established, costs are analyzed, and elements for the determination of success are commented on., 1h, Learning
	outcomes:2,4,5 14.A real practical case is considered: the market for products produced by the company is analyzed, the reproduction flow is established, costs are analyzed, and elements for the determination of success are commented on., 1h, Learning
	outcomes:2,4,5 15.A real practical case is considered: the market for products produced by the company is analyzed, the reproduction flow is established, costs are analyzed, and elements for the determination of success are commented on., 1h, Learning outcomes:2,4,5
Course content	1 No lessons Learning outcomes: 2.4.5
seminars	2. No lessons. Learning outcomes: 2,4,5
	3.No lessons, Learning outcomes:2,4,5
	4.No lessons, Learning outcomes:2,4,5
	5.No lessons, Learning outcomes:2,4,5
	6.No lessons, Learning outcomes:2,4,5
	7.No lessons, Learning outcomes:2,4,5
	8.No lessons, Learning outcomes:2,4,5
	9. No lessons, Learning outcomes:2,4,5
	10.No lessons, Learning outcomes:2,4,5
	11. No lessons, Learning outcomes: 2,4,5
	13 No lessons, Learning outcomes: 24 5
	14.No lessons, Learning outcomes:2,4,5
	15.No lessons, Learning outcomes:2,4,5
Required materials	Basic: classroom, blackboard, chalk
	Whiteboard with markers
	Urden environment
Exam literature	Basic literature: 1. M.Katavić, Osnove ekonomije za graditelje, Hrvatska Sveučilišna naklada, Hrvatska udruga za organizaciju građenja, Zagreb, 2009.
	Additional literature:
	1. J.E. Manser, Economics - a foundadtion course for the built environment , EFN Spon ,London ,UK 1995.
Students obligations	maximum of 3 absences from exercises
Knowledge	Redovitost pohaa#5#0#60\$Kolokvij, teorijska pitanja#2#100#50\$
evaluation during	
Knowlodgo	precentation of cominar paper
evaluation after	- presentation of seminar paper
semester	side examination (only to) sedectes who seeeessing presenced the seminar paper,
Student activities:	Aktivnost ECTS
	(Classes attendance) 1
	(Seminar Work) 1
	(Written exam) 1
	(Oral exam) 2
Remark	I his course can not be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have passed Matematika I
	Scudents cannot enroll in this course unless they have completed Social ageometrija u graditeljstvu i
	stadents carnot enrol in this course arrest hey have completed sociologija rada
ISVU equivalents:	22368;155973;
ISVU equivalents: Proposal made by	22368;155973; M Sc M C E, Časlav Dupović

Code WEB/ISVU	22876/22319	ECTS	7.0	Academic year	2018/2019			
Name	Mathematics I	•		•				
Status	1st semester - Undergraduate professional study in civil engineering (Redovni graditeljstvo) - obligatory course							
Teaching mode	Lectures + exercises ((auditory + labora	tory + seminar + met	odology + construction)	45+45 (45+0+0+0)			
	work at home				120			
Teachers	Lectures:1. Ivana Boži	ć Dragun dipl.pro	f.mat.					
	Lectures:mr. sc. Reni I	Banov dipl. ing. m Orlić Bachlor v pr	iat.					
	Auditory exercises mr	sc Reni Banov d	eu lint ing mat					
	Auditory exercises: Ma	artina Benković	inplit ing. mat.					
	Auditory exercises: Iva	ana Božić Dragun	dipl.prof.mat.					
	Auditory exercises:dr.	sc. Mandi Orlić Ba	chler v.pred					
Course objectives	acquiring basic knowledge in vector algebra and differential calculus of real functions of a single real variable							
Learning outcomes:	1.distinguish between	1.distinguish between sets of natural, whole, rational and real numbers. Level:6						
	2.calculate sum, produ	uct and quotient of	of complex numbers. L	evel:6				
	4 solve systems of line	ear algebraic equi	ations Level.6					
	5.distinguish between	j. distinguish between scalar and vector quantities. Level:6						
	6.find areas of polygor	find areas of polygons and volumes of polyhedrons by means of vector algebra. Level:6						
	7.determine equations	s of straight lines	in plane. Level:6,7					
	8.determine equations	s of straight lines	and planes in space. L	evel:6,7				
	10.evaluate limits of f	unctions. Level:6						
	11.find derivatives of	functions. Level:6						
	12.determine tangent	s and normals on	graphs of functions. Le	evel:6,7				
	13.determine local ext	trema and inflecti	on points of functions.	Level:6				
	14.sketch graphs of fu	Inctions. Level:6						
Methods of carrying	Ex cathedra teaching							
out lectures								
Methods of carrying	Group problem solving	g						
out auditory		-						
exercises								
Course content	1.Real numbers, 3h, L	earning outcomes	5:1					
lectures	2.Complex numbers, 3	3h, Learning outco	ing outcomosi?					
	4.Systems of linear ec	uations. 3h. Learn	ning outcomes:4					
	5.Vectors, 3h, Learnin	g outcomes:5						
	6.Scalar, vector and m	nixed product of v	ectors, 3h, Learning o	utcomes:6				
	7.Straight lines and pl	anes, 3h, Learnin	g outcomes:7,8					
	8.Midterm exam, 3n, L 9 Functions 3h Learn	Learning outcome	S:1,2,3,4,5,6,7,8					
	10.Limits, 3h, Learnin	g outcomes:10						
	11.Derivatives, 3h, Le	arning outcomes:	11					
	12.Applications of der	ivatives, 3h, Learı	ning outcomes:12	12				
	13.Local extrema and	inflection points,	3h, Learning outcome	5:13				
	15.Final exam. 3h. Lei	arning outcomes:	9.10.11.12.13.14					
		arming outcomes.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
Course content	1.Real numbers, 3h, L	earning outcomes	5:1					
auditory	2.Complex numbers, 3	3h, Learning outco	omes:2					
	3.Matrices and determ	ninants, 3h, Learn	ing outcomes:3					
	5 Vectors 3h Learnin	quations, 3h, Lean q outcomes:5	ning outcomes:4					
	6.Scalar, vector and m	nixed product of v	ectors, 3h, Learning o	utcomes:6				
	7.Straight lines and pl	anes, 3h, Learnin	g outcomes:7,8					
	8.Midterm exam, 3h, I	earning outcome	s:1,2,3,4,5,6,7,8					
	9.Functions, 3h, Learn	ing outcomes:9						
	11.Derivatives. 3h. Le	arning outcomes:	11					
	12.Applications of der	ivatives, 3h, Leari	ning outcomes:12					
	13.Local extrema and	inflection points,	3h, Learning outcome	s:13				
	14.Graph sketching, 3	h, Learning outco	mes:14					
	15.Final exam, 3h, Lea	arning outcomes:	9,10,11,12,13,14					
Required materials	Basic: classroom, blac	khoard chalk						
Required materials								
Exam literature	1. S. Suljagić: Matema	tika I, skripta, 20	05. http://nastava.tvz.ł	nr/ssuljagic/				
	2. M. Orlić, T. Perkov:	Repetitorij matem	natike za studente grad	diteljstva, TVZ, Zagreb, 2014.				
	3. I. Vuković: MATEMA	TIKA 1; Nakladnik	:: REDAK (2015.), ISBN	: 978-953-336-241-0				
	Additional literature:	· Zadaci i rijočon	i nrimieri iz metometič	ka analiza za tahnička fakultata	7. ispravljeno izdanjo			
	Golden marketing - Te	hnička kniiga. Za	areb. 2003.	ke analize za terifiicke lakultete,	r. ispravijeno izudilje,			
	2. N. Elezović: Linearn	ia algebra, Elemei	nt, Zagreb, 1995.					
	3. N. Elezović, A. Aglić	: Zbirka zadataka	iz linearne algebre, El	ement, Zagreb, 1995.				
	4. L. Krnić, Z. Šikić: Ra	ačun diferencijalni	i integralni, Školska ki	njiga, Zagreb, 1992.				
l	р. S. Kurepa: Matemat	ucka analiza I, Tel	ппіска клјіga, Zagreb,	1970.				

	6. Ž. Pauše: Zbirka teorijskih pitanja iz matematike za studente tehnike, Školska knjiga, Zagreb, 1995. 7. K. Singh: Engineering mathematics through applications, Palgrave Macmillan, 2003.				
Students obligations	It is required to achieve at least 30 points during the	semester.			
Knowledge evaluation during semester	During the semester it is possible to achieve a maximum of 60 points, as follows: - course completed: 30 points, - tests: 30 points. By achieving at least 45 points, a student is qualified for the oral exam, which is obligatory				
Knowledge evaluation after semester	At the exam it is possible to achieve a maximum of 40 points. The exam consists of written (for students with less then 45 points achieved during the semester) and oral part.				
Student activities:	Aktivnost ECTS (Classes attendance) 1 (Constantly tested knowledge) 2 (Written exam) 2 (Oral exam) 2				
Remark	This course can not be used for final thesis theme				
Prerequisites:	No prerequisites.				
Proposal made by	Ivana Božić Dragun, Reni Banov				

Code WEB/ISVU	23349/147426	ECTS	6.0	Academic year	2018/2019			
Name	Mathematics II							
Status	2nd semester - Underg	raduate professional stu	ıdy in civil engineering (F	Redovni graditeljstvo) - o	bligatory course			
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + :	seminar + metodology +	- construction)	45+30 (30+0+0+0) 105			
Teachers	Lectures:1. mr. sc. Reni Banov dipl. ing. mat. Lectures:2. dr.sc. Mandi Orlić Bachler v.pred Lectures:3. Ivana Božić Dragun dipl.prof.mat. Auditory exercises:mr. sc. Reni Banov dipl. ing. mat. Auditory exercises: Ivana Božić Dragun dipl.prof.mat. Auditory exercises:dr.sc. Mandi Orlić Bachler v.pred							
Course objectives	acquiring basic knowle equations, and the cor	dge on integral calculus responding numerical m	of real functions of a sin ethods	gle real variable, solving	ordinary differential			
Learning outcomes:	1.distinguish between 2.solve integrals using 3.solve integrals of rati 4.distinguish between 5.find areas using defir 6.find displacement, gi 7.find velocity, given a 8.solve differential equ 9.solve differential equ 10.solve first and seco 11.distinguish betweer 12.approximately solve 13.approximately solve 14.approximately solve	definite and indefinite in substitution and integra ional functions. Level:6,7 definite and improper in nite integrals. Level:6 iven velocity of straight li- cceleration of straight li- iations using separation lations by lowering the o nd order linear differenti n exact and approximate e equations using Newto e definite integrals. Leve e differential equations v	tegrals. Level:6 tion by parts. Level:6,7 tegrals. Level:6 ine motion as a function of of variables. Level:6 rder. Level:6 al equations. Level:6 · solutions of mathematio n's method. Level:6 !:6	of time. Level:6 of time. Level:6 cal problems. Level:6 vel:6				
Methods of carrying	Ex cathedra teaching							
Methods of carrying out auditory exercises	Group problem solving							
Course content	1.Definite and indefinit	te integral. 3h. Learning	outcomes:1					
lectures	2. Jechniques for integr 3. Integration of rationa 4. Definite and imprope 5. Applications of integr 6. Applications of integr 7. Midterm exam, 3h, L 8. Solving differential er 9. Lowering the order o 10. Linear differential er 11. Numerical methods 12. Numerical solution 13. Interpolation of fund 14. Numerical solution	ration, 3h, Learning outco al functions, 3h, Learning er integral, 3h, Learning ration in geometry, 3h, L ration in mechanics, 3h, earning outcomes:1,2,3, quations using separatio f differential equations, 3 quations, 3h, Learning o to f equations, 3h, Learning o f equations, 3h, Learning o totions and numerical inte of differential equations, urning outcomes:8,9,10,1	omes:2 outcomes:3 outcomes:4 .earning outcomes:5 Learning outcomes:6,7 4,5,6,7 in of variables, 3h, Learn 3h, Learning outcomes:9 utcomes:10 :11 ing outcomes:12 egration, 3h, Learning ou 3h, Learning outcomes: 1,12,13,14	ing outcomes:8 itcomes:13 14				
Course content auditory	1.Definite and indefinit 2.Techniques for integri 3.Integration of rationa 4.Definite and imprope 5.Applications of integri 6.Applications of integri 7.Midterm exam, 2h, Li 8.Solving differential e 9.Lowering the order o 10.Linear differential e 11.Numerical methods 12.Numerical solution 13.Interpolation of fund 14.Numerical solution 15.Final exam, 2h, Lea	e integral, 2h, Learning ration, 2h, Learning outc al functions, 2h, Learning r integral, 2h, Learning r ation in geometry, 2h, L ration in mechanics, 2h, earning outcomes:1,2,3, quations using separatio f differential equations, 2 quations, 2h, Learning o , 2h, Learning outcomes of equations, 2h, Learning o totoms and numerical inte of differential equations, rining outcomes:8,9,10,1	outcomes:1 omes:2 outcomes:3 outcomes:4 earning outcomes:5 Learning outcomes:6,7 4,5,6,7 n of variables, 2h, Learn 2h, Learning outcomes:9 utcomes:10 :11 ig outcomes:12 egration, 2h, Learning ou 2h, Learning outcomes: 1,12,13,14	ing outcomes:8 itcomes:13 14				
Required materials	Basic: classroom, black General purpose comp	<board, chalk<br="">uter laboratory</board,>			-			
Exam literature	 S. Suljagić: Matemat M. Orlić, T. Perkov: F Additional literature: B. P. Demidovič i dr. Golden marketing - Tel L. Krnić, Z. Šikić: Rai S. Kurepa: Matemati Ž. Pauše: Zbirka teo K. Singh: Engineerin 	ika II, skripta, 2006. http <pre></pre>	o://nastava.tvz.hr/ssuljag a studente graditeljstva, ri iz matematičke analize 203. ralni, Školska knjiga, Zag cnjiga, Zagreb, 1970. tike za studente tehnike applications, Palgrave Ma	ic/ TVZ, Zagreb, 2014. 2 za tehničke fakultete, 7 reb, 1992. , Školska knjiga, Zagreb, acmillan, 2003.	'. ispravljeno izdanje, , 1995.			

Students obligations	It is required to achieve at least 30 points during the semester.				
Knowledge evaluation during semester	During the semester it is possible to achieve a maximum of 60 points, as follows: - course completed: 30 points, - tests: 30 points. By achieving at least 45 points, a student is qualified for the oral exam, which is obligatory.				
Knowledge evaluation after semester	At the exam it is possible to achieve a maximum of 40 points. The exam consists of written (for students with less then 45 points achieved during the semester) and oral part.				
Student activities:	Aktivnost (Oral exam) (Written exam) (Classes attendance) (Constantly tested knowledge)	ECT5 2 1 1 2			
Remark	This course can not be used for final t	lesis theme			
Prerequisites:	Students cannot enroll in this course unless they have completed Matematika I Students cannot pass this course unless they have passed Matematika I				
ISVU equivalents:	22342;				
Proposal made by	Mandi Orlić Bachler, 14. 6. 2017.				

Code WEB/ISVU	23950/184763	ECTS	2.0	Academic year	2018/2019
Name	Methodology and Mana	agement in Civil I	Engineering		
Status	5th semester - Manage	ement in Civil Eng	gineering (Redovni gr	aditeljstvo) - obligatory course	
Teaching mode	Lectures + exercises (a	auditory + labora	itory + seminar + me	todology + construction)	15+15 (10+0+5+0)
	work at home				30
Teachers	Lectures:mr.sc. Lucija	Bačić v.pred.			
	Auditory exercises: Mr.	sc. Lucija Bacić v taša Uzelac	.pred.		
	Seminar exercises:mr.	sc. Lucija Bačić v	.pred.		
	Seminar exercises: Nat	taša Uzelac			
Course objectives	Acquiring the necessar	ry knowledge, ski	Ils and behavior as a	function of effective and efficier	t operation and
	management in the en	igineering profes	sion.		
Learning outcomes:	2 assess the significan	pts, concepts and ce and impact of	the elements of the elements o	ement. Level:6,7	nt on husiness Level 67
	3.analyze the planning	, decision making	g and organizing func	tion. Level:6	
	4.assess the role and i	mportance of hur	man resources manag	gement and leadership. Level:6,	7
	5.analyze the function	of controlling. Le	vel:6		
Mothoda of comulan	Ex cathodra toaching				
out lectures	Case studies				
	Discussion				
	Questions and answers	5			
	Other	stad through dag	constration and comm	arican of various management	tulos in this way students
	will learn that better b	usiness results m	av be achieved throu	anson of various managements	experts and managers An
	emphasis will be place	d on the significa	ince of using method	s proper to social sciences to de	velop management as a
	profession and to deve	elop managers - e	experts.		
Methods of carrying	Group problem solving				
out auditory	Traditional literature a	nalysis Iodao diacovon <i>i</i> (an the Web		
exercises	Discussion, brainstorm	ina	on the web		
	Other				
	Presentation of probler	ms and tasks rela	iting to managerial pr	ofession and solving problems b	oth individually and in
	teams.				
Methods of carrying	Traditional literature a	nalysis Jedge discovery (on the Web		
out seminars	Essav writing	ledge discovery (
	Discussion, brainstorm	ing			
	Interpretation and pres	sentations of pap	ers in areas of high ir	terest to students.	
Course content	1.Introductory lecture,	methodology an	d operationalisation l	ectures and exercises, 1h, Learn	ing outcomes:1
lectures	3. External and interna	anagement, 1n, 1 al environment, 1	h. Learning outcomes:	:1.2	
	4.Planning, 1h, Learnin	ng outcomes:1,3	in, Leanning baccomer	,_	
	5.Decision making, 1h,	Learning outcon	nes:1,3		
	6.Organizing, 1h, Leari	ning outcomes:1,	3		
	8.Human resources ma	anagement (1), 1	h. Learning outcomes	::1.4	
	9.Human resources ma	anagement (2), 1	h, Learning outcomes	:1,4	
	10.Leading, 1h, Learni	ng outcomes:1,3			
	11.Controlling, 1h, Lea	rning outcomes:	L,5 d conflict solving 1h	Learning outcomes:1.3.4	
	13.Ethics and social re	sponsibility, 1h, l	_earning outcomes:1,	2,4	
	14.Specificity of managed	gement in Civil E	ngineering, 1h, Learn	ing outcomes:1,2,3,4,5	
	15.2. Preliminary exam	n, 1h, Learning ou	utcomes:1,4,5		
Course content	1 Group discussion 1h		mac:1 2 3 4 5		
auditory	2.Group discussion, 1h	. Learning outcom	nes:1		
,, ,	3.Interpretation practio	cal examples, gro	oup discussion and pr	oposals to solve problems, 1h, L	earning outcomes:1,2
	4.Interpretation praction	cal examples, gro	oup discussion and pr	oposals to solve problems, 1h, L	earning outcomes:1,3
	5.Interpretation practic	cal examples, gro	oup discussion and pr	posals to solve problems, 1h, L	earning outcomes:1,3
	7.No classes	cal examples, gro			saming outcomes.1,5
	8.Interpretation praction	cal examples, gro	oup discussion and pr	oposals to solve problems, 1h, L	earning outcomes:1,4
	9.No classes				
	10.Interpretation pract	ical examples, gi	roup discussion and p	roposals to solve problems, 1h,	Learning outcomes: 1,3
	12.No classes	ical examples, gi			Learning outcomes.1,3,4
	13.No classes				
	14.Interpretation pract	ical examples, gi	roup discussion and p	roposals to solve problems, 1h,	Learning
	Outcomes:1,2,3,4,5				
Course content	1.No classes				
seminars	2.No classes				
	3.NO Classes				
	5.No classes				
I					

	6.No classes					
	7.Essay presentation and group discussion , 1h, Learning outcomes:1,2,3					
	0.000 Classes 9 Essay presentation and group discussion. The Learning outcomes:1.2.3					
	10.No classes					
	11.No classes					
	12.Essay presentation and group discussion, 1h, Learning outcomes:4,5					
	13.Essay presentation and group discussion , 1h, Learning outcomes:4,5					
	14.No classes					
	13.Essay presentation and group discussion, in, Leaning outcomes.1,2,3,4,5					
Required materials	Is Basic: classroom, blackboard, chalk					
	Overhead projector					
Exam literature	Sikavica, P., Bahtijarević-Šiber, F., Pološki Vokić, N. (2008.), Temelji menadžmenta, Školska knjiga,					
	Zagreb					
	Medanic, B. (1997), Management u gradevinarstvu, Gradevinski fakultet, Osijek Rubla, M. (2006), Manadžment, Ekonomski fakultet, Split					
Students obligations	Autond 70% of lasses and averiae					
Knowledge	Accularity of attackardance and activity in lectures and exercises 15%					
evaluation during	Presentation of seminar work or essay 15%.					
semester	1. and 2. preliminary exam 70%.					
	Max. 10 points					
	10 excellent (5)					
	5 sufficient (2)					
	0 4 fail (1)					
Knowledge	Written exam 70%.					
evaluation after	Mars 10 molector					
semester	Max. 10 points:					
	B 9 very and (4)					
	6 7 good (3)					
	5 sufficient (2)					
	0 4 fail (1)					
Student activities:	Aktivnost ECTS					
	(Classes attendance) 1					
	(Written exam) 1					
Remark	This course can not be used for final thesis theme					
Prerequisites:	Students cannot enroll in this course unless they have passed Sociologija rada					
	Students cannot enroll in this course unless they have passed Matematika II					
	Students cannot enroll in this course unless they have passed Profacult Konstrukcija Students cannot enroll in this course unless they have completed Tržište i poslovno okruženie					
	Stadents cannot enror in this course amess they have completed inciste i posiovno okrazenje					
ISVU equivalents:	22366;155945;					
Proposal made by	Lucija Bačić, MSc, senior lekturer					

Code WEB/ISVU	23452/155960	ECTS	6.0	Academic year	2018/2019		
Name	Organization of Constru	uction Site					
Status	5th semester - Manage	ment in Civil Enginee	ering (Redovni gra	diteljstvo) - obligatory course			
Teaching mode	Lectures + exercises (auditory + laboratory + seminar + metodology + construction) 30+45 (15+0+0+30)						
	work at home				105		
Teachers	Lectures:1. mr.sc. Petar Adamović prof.v.škole						
	Lectures:v.predavać Boris Uremović dipl.ing.građ.						
	Auditory exercises: Domagoj Sojat struc.spec.ing.aedit. Auditory exercises:y predavač Boris Uremović dipl.ing.građ						
	Construction exercises: Domagoi Šoiat struč.spec.ing.aedif.						
	Construction exercises:v.predavač Boris Uremović dipl.ing.građ.						
Course objectives	Acquiring knowledge on site organisation in preparation for construction work						
Learning outcomes:	1.plan necessary logistic, technical, technological, and organizational resources for the organization and realization of						
	on-site works. Level:6,7						
	2 calculate quantities of material resources needed for the realization of on-site works. Level:6						
	3.devise possible alternatives for organizing technological and logistical on-site construction processes. Level:6, /						
	4. combine possible alternatives for organizing technological and logistical on-site construction processes. Level:6, /						
	6.correlate construction	n processes and reso	urces on the cons	truction site. Level:6.7			
	7.produce the obligatory Work Plan for the construction site. Level:6,7						
	8.conduct site establish	ment and site prepa	ration activities, a	nd make preparations for on-site	e construction works in		
	accordance with regulations. Level:6,7						
	9.correlate planned cor	nstruction resources	during on-site real	ization of works. Level:6,7			
	10.organize the technique, technology and logistics of the construction process, and safety at work on the construction						
	11 re-examine achieve	ments during realiza	tion of on-site wor	ks Level:67			
	11. identify problems encountered during conduct of on-site works, namely with regard to logistics and organization of						
	such works. Level:6						
	13.solve problems enco	ountered during cond	luct of on-site wor	ks, namely by improving logistics	and organization of such		
	works. Level:6						
Methods of carrying	Ex cathedra teaching						
out lectures	Discussion						
	Other						
	Appropriate teaching a	ids (video projector a	and computer) will	be used during presentation of s	site organization		
	techniques applied on i	real construction site	s. Drawings, photo	ographs, films and video recordin	igs will also be used as		
	appropriate.						
Methods of carrying	Group problem solving						
out auditory							
How construction	Group problem colving						
exercises are held	Other						
	Students will independe	ently solve problems	as needed for the	ir assignment ("site organisation	plan").		
Course content	1.Construction, 2h, Lea	rning outcomes:1,6,	7				
lectures	2.Construction resource	es, 2h, Learning outc	omes:2,9				
	3.Structures and consti	ruction sites, 2h, Lea	rning outcomes:1,	3,4,5			
	4.Structures and consti	ruction sites, 2n, Lea	rning outcomes:1,	3,4,5,0,7	10.10		
	6 Regulations concerni	na construction sites	2h Learning out	r_{omes} 7 8 12 13	12,15		
	7.Planning works on the	e construction site, 2	h, Learning outcoi	mes:6,8,9,10			
	8.Preparation of constr	uction site, 2h, Learr	ing outcomes:8,1	0			
	9.Field trip visit to a co	nstruction site, 2h, L	earning outcomes	3,4,5,8,10,12,13			
	10.Field trip visit to a c	onstruction site, 2h,	Learning outcome	s:3,4,5,8,10,11,12,13			
	11.Construction site log	gistics, 2h, Learning (outcomes:2,3,4,5,	10,11,12,13			
	13 Construction site dia	and installations, 20	outcomes 3 4 5 1	0 12 13			
	14.Construction site do	cuments. 2h. Learnir	a outcomes:7.8.1	0			
	15.Construction site do	cuments, 2h, Learnir	ng outcomes:7,10				
Course content	1.Site disposition and la	ayout plan with all ne	ecessary calculation	ons and drawings: On-site service	s and temporary roads,		
auditory	2n, Learning outcomes	:1,2,3,4,5,6,7,8,9	ction cito. 2h Loo	rning outcomocil 2 2 4 5 6 7 8 0			
	3 Distribution of manuf	acturing plants and o	construction mach	inery 2h Learning outcomes:1.2	2 3 4 5 6 7 8 9		
	4.Calculation of storage	e space, defining and	planning tempora	arv on-site structures. 2h. Learnir	1a		
	outcomes:1,2,3,4,5,6,7	,8,9	5 1	,	5		
	5.Cost estimate for pre	liminary work, 2h, Le	arning outcomes:	1,2,3,4,5,6,7,8,9			
	6.Time schedule for the	e realization of prelim	ninary works on a	construction site, 2h, Learning			
	outcomes:7,8,9,10,11,1	12,13					
	7.no classes, 2h						
	9 no classes, 211						
	10.no classes. 2h						
	11.no classes, 2h						
	12.no classes, 2h						
	13.no classes, 2h						
	14.no classes, 2h						
TVZ

	15.no classes, 2h
Course content	no classes 2h
constructures	
constructures	a no classes 2h
	A no classes. Zh
	5 no classes 2h
1	6 no classes. 2h
	7.Students independently prepare the program assignment: (Preliminary) design of organisation (and preparation) of a construction site. 2h
	8.Students independently prepare the program assignment: (Preliminary) design of organisation (and preparation) of a construction site, 2h
	9.Students independently prepare the program assignment: (Preliminary) design of organisation (and preparation) of a construction site, 2h
	10.Students independently prepare the program assignment: (Preliminary) design of organisation (and preparation) of a construction site, 2h
	11. Students independently prepare the program assignment: (Preliminary) design of organisation (and preparation) of a construction site, 2h
	12.Students independently prepare the program assignment: (Preliminary) design of organisation (and preparation) of a construction site, 2h
	construction site, 2h
	construction site, 2h
	construction site, 2h
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers
	Overhead projector
	Video equipment
Exam literature	Basic literature:
	1. J. Marušić: Organizacija građenja, Sveučilište u Zagrebu, 1994.
	Additional literature:
	1.www.tvz.hr - Građevinski strojevi - Pridruženi dokumenti
	1. knjiga: Knjige o građevinskim strojevima
	o "Učinak građevinskih strojeva":
	o "Postrojenia za proizvodnju gradiva. I.dio. Drobilane. Tvornice betona (betonare). Asfaltne baze (asfaltna
	postrojenja)";
	o Izbor strojeva i planiranje strojnog rada u građenju
	2. knjiga:
	o "Tehnologija građenja I, Zemljani radovi".
	3. knjiga:
	o "Sustavi građevinskih strojeva"
	2.Zdravko Linarić : Leksikon strojeva i opreme za proizvodnju građevinskih materijala, učinci građevinskih strojeva i
	vozila pri zemljanim radovima, biblioteka Mineral, Business Media Croatia d.o.o., Zagreb, 2007.
	3.Rudolf Lončarić: Organizacija graditeljskih projekata , Sveučilište u Zagrebu, Zagreb, 1995.
Students obligations	maximum of 3 absences from exercises
Knowledge	Redovitost pohaa#10#0#60\$Kolokvij, numeri zadaci#1#50#60\$Kolokvij, teorijska pitanja#1#50#60\$Programski
evaluation during semester	zadatak#1#100#100\$
Knowledge	Assignment (site organisation plan for civil engineering and building engineering projects),
evaluation after	Presentation and explanation of Assignment.
semester	Written examination focusing on theory (lectures) and exercises (solving problems relating to the assignment - site
	organisation plan for civil engineering and building engineering projects)
	Oral examination (for students who passed the written examination)
Student activities:	Aktivnost ECTS
	(Project) 3
	(Written exam) 1
D	(Oral exam) 2
Remark	I mis course can be used for final thesis theme.
Prerequisites:	progents cannot enroll in this course unless they have completed Gradevinski strojevi
	prodents cannot enfoli in this course unless they have passed Matematika II
	producins cannot enroll in this course unless they have passed Proracun Konstrukcija
	prodents cannot enroll in this course unless they have completed Trziste i poslovno okruženje
	Students cannot pass this course unless they have passed Gradevinski strojevi
ISVU equivalents:	22365;
Proposal made by	mr.sc. Petar Adamović, 17.9.2018

Code WEB/ISVU	22881/22336	ECTS	5.0	Academic year	2018/2019
Name	Physics		5.0	Actuacióne year	2010/2015
Status	2nd semester - Underr	araduate profession	al study in civil engi	peering (Redovni graditelistvo)	- obligatory course
Teaching mode	Lectures + evercises (auditory + laborato	$r_{\rm r} \pm cominar \pm mot$	adology + construction)	30+30(15+15+0+0)
reaching mode	work at home		Ty + Seminar + met	ouology + construction)	90
Teachers	Lectures: 1. prof.vis.šk.	. Ivica Levanat			
	Lectures:2. Alemka Kn	app			
	Auditory exercises: Ale	emka Knapp			
	Laboratory exercises:p	prof.dr. Dubravko Ho	orvat		
	Laboratory exercises:	Diana Šaponja-Milu	tinović dipl.ing.fizike	, pred.	
Course objectives	Students will understa	nd physical phenon	nena and quantities	used in the study of civil engine	eering described within a
	broader context of the	basic laws of physi	ICS.		
Learning outcomes:	1.calculate simple rect	ilinear and circular	motions. Level:6	famore laurel C	
	2.calculate translation	al acceleration of a	body influenced by	Torces. Level:6	
	4 differentiate tradition	nal-mechanical des	cription of motion fro	om special relativity. Level:6	
	5.compare gravitation	al. electric and mac	netic field. Level:6.7	7	
	6.analyze electric curr	ents and voltages in	n simple direct curre	nt circuits. Level:6	
	7.calculate pressure in	liquid and buoyand	cy. Level:6		
	8.draw a harmonic vib	ration sketch. Level	1:6		
	9.correlate heat and te	emperature, and he	at transfer mechanis	sms. Level:6,7	
	<u> </u>				
Methods of carrying	Ex cathedra teaching				
outlectures	Demonstration				
	Discussion				
	Questions and answer	S			
	Other				
	Oral presentation, inclu	uding communication	on with students; the	eir active participation is stimul	ated during formulation
	and analysis of physica	al laws. Physical ph	enomena and laws a	are illustrated by familiar examp	oles or improvised
	demonstrations, and b	y simple experimer	its where possible. E	equations and their derivations	are fully outlined on the
Mathada of comminent	Diackboard, illustrated	by sketches and di	agrams as appropria	ite.	
methods of carrying	Discussion brainstorm	l			
exercises	Interactive problem so	lvina			
	Other				
	Solving simpler proble	ms in the topics cov	vered by the lecture	s, in order to increase understa	nding of physical quantities
	and their interrelations	 Calculations inclu 	de numerical values	which appear in technical app	lications. Teacher explains
	and illustrates the proc	cedure, students so	lve the problems on	the blackboard and in their not	tebooks.
Methods of carrying	Laboratory exercises o	on laboratory equipr	ment		
out laboratory	Group problem solving	J			
exercises	Uther Measurement of physic	cal quantities which	a illustrato physical l	aws introduced in the lectures	Analysis of the
	measurements results	tal qualitities which	i illustrate priysicar i	aws incloduced in the lectures.	
Course content	1 Physical quantities a	nd units 2h Learn	ing outcomes 1 2 3		
lectures	2.Use of differential ca	Iculus., 2h. Learnin	a outcomes:1.2.3		
	3.Rectilinear motion, fi	ree fall., 2h, Learnir	ng outcomes:1		
	4.Circular motion, rota	tion., 2h, Learning	outcomes:1		
	5.Newton axioms., 2h,	Learning outcomes	3:2		
	6.Work and power., 2h	, Learning outcome	s:3		
	7.Kinetic and potential	energy., Zn, Learn	Ing outcomes:3		
	9 Law of gravity field	notential 2h Lear	ning outcomes 5	les.4	
	10.Electric force and v	oltage, current., 2h	. Learning outcomes	3:5.6	
	11.Magnetic field, elec	tromagnetic induct	ion., 2h, Learning οι	utcomes:5	
	12.Hydrostatics: press	ure and buoyancy.,	2h, Learning outcor	nes:7	
	13.Bernoulli equation.,	, 2h, Learning outco	omes:7		
	14.Harmonic oscillation	ns., 2h, Learning ou	itcomes:8		
	15.Heat and temperate	ure, neat transfer.,	Zn, Learning outcom	165:9	
Course content	1 No cossion				
auditory	2.Rectilinear motion	2h. Learning outcor	nes:1		
·····,	3.No session.	j			
	4.Free fall. Vertical , 1h	h, Learning outcom	es:1		
	Circular motion, 1h, Le	arning outcomes:1			
	5.No session.		- 2 2		
	6.Newton axioms., 2n,	Learning outcomes	5:2,3		
	8 Newton aksioms 1h		2 2 . 2		
	Work, energy and pow	er., 1h. Learning outcome	itcomes:3		
	9.1. partial exam, 1h, I	Learning outcomes:	:1,2,3,4		
	10.Gravitational and e	lectric field., 1h, Le	arning outcomes:5		
	DC circuits., 1h, Learni	ing outcomes:6	-		
	11.No session.				
	12.DC circuits., 1h, Lea	arning outcomes:6			
	Hydrostatics and hydr	odynamics , 1h, Le	arning outcomes: /		
	15.NO SESSION.				

	14.Harmonic oscillations., 1h, Learning outcomes:8
	15.2. partial exam, 1h, Learning outcomes:5,6,7,8,9
Course courtourt	1 Cabadula and measuration 1b
laboratory	2 No lab
laboratory	3. Measurement and analysis of results . 2h
	4.No lab.
	5.Density of solid body., 2h, Learning outcomes:7
	6.No lab.
	7.Density of alcohol., 2h, Learning outcomes:7
	8.No lab.
	9. Spiral spring law., 2h, Learning outcomes:8
	10.No lab.
	11. Iorsion pendulum., 2h, Learning outcomes:8
	12.No lab.
	13.Joue law, 2n, Learning outcomes:9
	14.10 Jab. 15 Power of alternating current - 2h Learning outcomes:6
	15.1 ower of alternating current, 21, Learning outcomes.o
Required materials	Basic: classroom, blackboard, chalk
	Special purpose laboratory
	Whiteboard with markers
	Overhead projector
Exam literature	Basic literature:
	1. Levanat, I., Fizika za TVZ Kinematika i dinamika, TVZ, Zagreb, 2010.
	2. Kulišić, P., Mehanika i toplina, Skolska knjiga, Zagreb, 2005.
	Additional literature:
	1. Young Freedman, University Physics, Addison Wesley, San Francisco, 2007.
a	2. Kuzmanovic, B., Osnove elektrotenike 1, Element, Zagreb, 2001.
Students obligations	Positive report from laboratory exercises.
Knowledge	Two partial exams, each with numerical problems and theoretical questions.
evaluation during	Minimum to pass each partial exam: theory 40%, problems 50%.
semester	For attending lectures, up to 10% of theory maximum added.
Knowledge	Full exam, with numerical problems and theoretical questions.
evaluation after	Minimum to pass: 40% problems and 40% theory.
Student activities	Aktivnost ECTS
Student activities:	(Written evam) 3
	(Villeer exam)
Remark	This course can not be used for final thesis theme
Prerequisites:	Students cannot pass this course unless they have completed Matematika I
Proposal made by	prof.vis.šk. Ivica Levanat , 03. 03. 2014.
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Code WEB/ISVU	23445/155943	ECTS	6.0	Academic year	2018/2019
Name	Planning Methods				
Status	6th semester - Manage	ment in Civil Engineering	g (Redovni graditeljstvo)	- obligatory course	
Teaching mode	Lectures + exercises (a	auditory + laboratory + s	seminar + metodology +	construction)	30+45 (15+0+0+30)
	work at home				105
Teachers	Lectures:1. mr.sc. Casl	av Dunović , viši predava	ač		
	Auditory exercises: Nin	a Santek struč.spec.ing.	aedif., predavač		
	Auditory exercises: Doi	nagoj Sojat struc.spec.ir redavač Boris Uromović c	lg.aeuir. Iinl ing građ		
	Construction exercises	· Nina Šantek struč spec	ing aedif predavač		
	Construction exercises	: Domagoj Šojat struč.sp	ec.ing.aedif.		
	Construction exercises	: Sanela Vojnović mag.in	g.aedif		
Course objectives	The aim of the course i	s to teach students abou	it planning techniques ai	nd time scheduling for c	onstruction work,
	including all necessary	resources.			
Learning outcomes:	1.distinguish between i	ndividual project plannir	ig methods. Level:6		
	3 identify all phases in	a construction project.	evel:6		
	4.categorise project pla	anning and monitoring ta	isks. Level:6		
	5.use advance software	e tools to create basic tir	me schedule with resour	ces plan. Level:6,7	
	6.prepare basic time so	chedule for the monitorin	ig and inspection proces	s. Level:6,7	
	7.define project partici	pants as related to the p	roject planning and mon	itoring process. Level:6	
Methods of carrying	Ex cathodra toaching				
out lectures	Discussion				
	Questions and answers	;			
	Appropriate teaching a	ids (video projectors and	l computers) will be used	during lectures.	
Methods of carrying	Laboratory exercises, o	computer simulations			
out auditory	Group problem solving				
exercises	Discussion, brainstorm	ing			
	Workshop				
	Other				
	Exercises will be condu	icted in the computer roo	om where topics relating	to program preparation	(operative construction
	plan) are explained bas	sed on the MS Project so	ftware.		
How construction	Laboratory exercises, o	computer simulations			
exercises are held	Group problem solving	·			
	Discussion, brainstorm	ing			
	Workshop				
	Other				
	These exercises will be	conducted in the compu	iter room where student	s will independently solv	e practical planning
-	problems on-real life ex	camples, all based on the	e PS Project software.		
Course content	1.Role of planning in co	onstruction process, 2h, l	Learning outcomes:2		
lectures	3.Plan and planning rec	puirements . 2h. Learning	a outcomes:2		
	4.Plans - classification	and types, 2h, Learning (outcomes:2		
	5.Objectives, principles	and methodology for el	aboration of plans, 2h, L	earning outcomes:2	
	6.Input parameters and	d values relevant for the	elaboration of plans, 2h,	Learning outcomes:3,4	,5
	7. Time scheduling tech	hnique using methods Cl	PM, Pert and PDM, and th	ne scope of application, 2	2h, Learning
	8 Time scheduling tecl	hnique using methods Cl	PM Pert and PDM and th	e scope of application	2h Learning
	outcomes:1,5	inique using methods el	n, rereard ron, and r		in, Leaning
	9. Work phases and de	finition of plan elaboration	on activities , 2h, Learnin	ig outcomes:3,5	
	10.Optimization and co	ontrol of realization, 2h, L	earning outcomes:5,6,7		
	11.Primjena kompjuter	skih programa u planirar	iju, 2h, Learning outcom	es:5,6,7	67
	13 Basic principles of	planning with the MS Pro	ject software package, 2	th Learning outcomes:5	,0,7 67
	14.Management of res	ources (costs. labour. ma	chines) , 2h. Learning o	utcomes:5.6.7	
	15.Management of reso	ources (costs, labour, ma	chines) , 2h, Learning o	utcomes:5,6,7	
Course content	1.Introduction to MS Pr	oject and overview of ba	sic commands, 1h, Lear	ning outcomes:5,6,7	ata activitian duration of
auditory	activities 2h Learning	outcomes:5.6.7	l), entering activities, en	tering data for appropria	ate activities, duration of
	3.Grouping activities, t	vpe of connections, esta	blishing and changing co	nnections among activit	ties, time reserves.
	identification of critical	path, Gantt chart chang	ing, preparation for print	ting, 2h, Learning outcor	mes:5,6,7
	4.Creating a time sche	dule, entering activities,	allocation of data to app	ropriate activities, estab	lishing and changing
	connections among act	ivities, modification of ti	me schedule, preparatio	n for printing, 2h, Learni	ng outcomes:5,6,7
	5. Definition and alloca	tion of resources, enterin	ng resource data in the p	plan, definition and alloc	ation of costs, entering
	cost data in the plan, g	raphical presentation of	resources and costs, pre	eparation for printing , 1	n, Learning
	6.Plan analysis and har	monization. plan harmor	nization and plan shorter	ning strategies, solving r	problems related to the
	excessive use of resour	rces (1)., 1h, Learning ou	itcomes:5,6,7	J = = = <u>J</u> = = , S =	
	7.Laboratory exercises	, 2h, Learning outcomes:	3,5,6		
	8.Laboratory exercises	, 2h, Learning outcomes	3,5,6		
	9.Laboratory exercises	, 2n, Learning outcomes:	3,5,6		
	11.1 aboratory exercise	s, 2n, Learning outcome s. 2h. Learning outcome	s.3,3,0 s:3,5,6		
I		o, in, courning outcome	,.,.		

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15. Laboratory exercises, 2h, Learning outcomes: 35.6 Course content 1.07al Exercises, 2h, Learning outcomes: 56.7 2.07al Exercises, 2h, Learning outcomes: 56.7 3.07al Exercises, 2h, Learning outcomes: 56.7 3.07al Exercises, 2h, Learning outcomes: 56.7 5.07al Exercises, 2h, Learning outcomes: 55.6 7.07al Exercise, 2h, Learning outcomes: 55.6 10.07ae Exercise, 2h, Learning outcomes: 55.6 <th></th> <th>13.Laboratory exercises, 2n, Learning outcomes: 3,5,6 14 Laboratory exercises, 2h, Learning outcomes: 3,5,6</th>		13.Laboratory exercises, 2n, Learning outcomes: 3,5,6 14 Laboratory exercises, 2h, Learning outcomes: 3,5,6
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format, using the MS Project software package. 2b. Learning outcomes: 3.5.6 Software package. 2b. Learning outcomes: 3.5.6 format, using the MS Project software package. 2b. Learning outcomes: 3.5.6 Software package. 2b. Learning outcomes: 3.5.6 Bindependent preparation of an operative construction plan (planning time, resources, and costs) in an electronic format, using the MS Project software package. 2b. Learning outcomes: 3.5.6 Bindependent preparation of an operative construction plan (planning time, resources, and costs) in an electronic format, using the MS Project software package. 2b. Learning outcomes: 3.5.6 10.10mbeted preparation of an operative construction plan (planning time, resources, and costs) in an electronic format, using the MS Project software package. 2b. Learning outcomes: 3.5.6 11.10mbeted preparation of an operative construction plan (planning time, resources, and costs) in an electronic format, using the MS Project software package. 2b. Learning outcomes: 3.5.6 12.10mbeted preparation of an operative construction plan (planning time, resources, and costs) in an electronic format, using the MS Project software package. 2b. Learning outcomes: 3.5.6 13.10mbeted preparation of an operative construction plan (planning time, resources, and costs) in an electronic format, using the MS Project software package. 2b. Learning outcomes: 3.5.6 13.10mbeted preparation of an operative construction plan (planning time, resources, and costs) in an electronic format, using the MS Project software package. 2b. Learning outcomes: 3.5.6 13.10mbeted preparation of an operative construction plan (planning time, resources, and costs		5. Independent preparation of an operative construction plan (planning time, resources, and costs) in an electronic
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2. M.Radujković i suradnici: Planiranje i kontrola projekta, Udžbenici Sveučilišta u Zagrebu, Zagreb, 2012. Additional literature: 1. S.Nonveiller: Metode mrežnog planiranja i njihova primjena u rukovođenju građenjem, GF Zagreb, Zagreb 1982. 2. J. Branderberg, R. Konrad: Tehnika mrežnog planiranja, Tehnička knjiga, Zagreb 1970. 3. J. Marušić: Organizacija građenja, Sveučilište u Zagrebu, 1994. 4. MS Project Users guide Students obligations maximum of 3 absences from exercises Knowledge evaluation during semester Knowledge valuation after Explanations relating to the above assignment oral examination (students may take this exam after having fulfilled the above obligations) Student activities: Aktivnost ECTS (Written exam) 4 (Oral exam) 2 Remark This course can be used for final thesis theme Prerequisites: Students cannot enroll in this course unless they have completed Organizacija građenja I ISVU equivalents: 22364;147445;		Tehničkog veleučilišta u Zagrebu, Zagreb 2010.
Additional literature: 1. S.Nonveiller: Metode mrežnog planiranja i njihova primjena u rukovođenju građenjem, GF Zagreb, Zagreb 1982. 2. J. Branderberg, R. Konrad: Tehnika mrežnog planiranja, Tehnička knjiga, Zagreb 1970. 3. J. Marušić: Organizacija građenja, Sveučilište u Zagrebu, 1994. 4. MS Project Users guide Students obligations maximum of 3 absences from exercises Knowledge evaluation during semester Knowledge evaluation after Explanations relating to the above assignment semester Oral examination (students may take this exam after having fulfilled the above obligations) Student activities: Aktivnost ECTS (Written exam) 4 (Oral exam) 2 Remark This course can be used for final thesis theme Prerequisites: Students cannot enroll in this course unless they have completed Organizacija građenja I ISVU equivalents: 22364;147445; Proposal made by M.Sc.M.C.E. Časlav Dunović		2. M.Radujković i suradnici: Planiranje i kontrola projekta, Udžbenici Sveučilišta u Zagrebu, Zagreb, 2012.
Additional interactive: 1. S.Nonveiller: Metode mrežnog planiranja i njihova primjena u rukovođenju građenjem, GF Zagreb, Zagreb 1982. 2. J. Branderberg, R. Konrad: Tehnika mrežnog planiranja, Tehnička knjiga, Zagreb 1970. 3. J. Marušić: Organizacija građenja, Sveučilište u Zagrebu, 1994. 4. MS Project Users guide Students obligations maximum of 3 absences from exercises Knowledge evaluation during semester Knowledge 1 assignment (operative plan for a construction project), evaluation after semester Oral examination (students may take this exam after having fulfilled the above obligations) Student activities: Aktivnost (Written exam) (Oral exam) 2 Remark Prerequisites: Students cannot enroll in this course unless they have completed Organizacija građenja I ISVU equivalents: 22364;147445; Proposal made by		Additional literature
2. J. Branderberg, R. Konrad: Tehnika mrežnog planiranja, Tehnička knjiga, Zagreb 1970. 3. J. Marušić: Organizacija građenja, Sveučilište u Zagrebu, 1994. 4. MS Project Users guide Students obligations maximum of 3 absences from exercises Knowledge Redovitost pohaa#5#0#60\$Kolokvij, numeri zadaci#1#50#60\$Kolokvij, teorijska pitanja#1#50#60\$Programski zadatak#1#0#100\$ semester Knowledge 1 assignment (operative plan for a construction project), evaluation after Explanations relating to the above assignment oral examination (students may take this exam after having fulfilled the above obligations) Student activities: Aktivnost ECTS (Written exam) 2 Remark This course can be used for final thesis theme Prerequisites: Students cannot enroll in this course unless they have completed Organizacija građenja I ISVU equivalents: 22364;147445; Proposal made by M.Sc.M.C.E. Časlav Dunović		1. S.Nonveiller: Metode mrežnog planirania i njihova primjena u rukovođenju građenjem. GF Zagreb. Zagreb 1982.
3. J. Marušić: Organizacija građenja, Sveučilište u Zagrebu, 1994. 4. MS Project Users guide Students obligations maximum of 3 absences from exercises Knowledge evaluation during semester Vinter examination (students may take this exam after having fulfilled the above obligations) Student activities: Aktivnost (Oral exam) 2 Remark This course can be used for final thesis theme Prerequisites: Students: 22364;147445; Proposal made by		2. J. Branderberg, R. Konrad: Tehnika mrežnog planiranja, Tehnička knjiga, Zagreb 1970.
4. MS Project Users guide Students obligations maximum of 3 absences from exercises Knowledge Redovitost pohaa#5#0#60\$Kolokvij, numeri zadaci#1#50#60\$Kolokvij, teorijska pitanja#1#50#60\$Programski evaluation during zadata#1#0#100\$ semester 1 assignment (operative plan for a construction project), evaluation after Explanations relating to the above assignment oral examination (students may take this exam after having fulfilled the above obligations) Student activities: Aktivnost (Oral exam) 2 Remark This course can be used for final thesis theme Prerequisites: Students cannot enroll in this course unless they have completed Organizacija građenja I ISVU equivalents: 22364;147445; Proposal made by M.Sc.M.C.E. Časlav Dunović		3. J. Marušić: Organizacija građenja, Sveučilište u Zagrebu, 1994.
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evaluation after semester Explanations relating to the above assignment Oral examination (students may take this exam after having fulfilled the above obligations) Student activities: Aktivnost (Written exam) 4 (Oral exam) ECTS Remark This course can be used for final thesis theme 2 Prerequisites: Students cannot enroll in this course unless they have completed Organizacija građenja I ISVU equivalents: 22364;147445; Proposal made by M.Sc.M.C.E. Časlav Dunović Ector Image: Control of the state of the	Knowledge	1 assignment (operative plan for a construction project),
semester Oral examination (students may take this exam after having fulfilled the above obligations) Student activities: Aktivnost ECTS (Written exam) 4 (Oral exam) 2 Remark This course can be used for final thesis theme Prerequisites: Students cannot enroll in this course unless they have completed Organizacija građenja I ISVU equivalents: 22364;147445; Proposal made by M.Sc.M.C.E. Časlav Dunović	evaluation after	Explanations relating to the above assignment
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Witten examp 4 (Oral exam) 2 Remark This course can be used for final thesis theme Prerequisites: Students cannot enroll in this course unless they have completed Organizacija građenja I ISVU equivalents: 22364;147445; Proposal made by M.Sc.M.C.E. Časlav Dunović	Student activities:	Aktivnost ECTS
Remark This course can be used for final thesis theme Prerequisites: Students cannot enroll in this course unless they have completed Organizacija građenja I ISVU equivalents: 22364;147445; Proposal made by M.Sc.M.C.E. Časlav Dunović		(Oral exam) 2
Prerequisites: Students cannot enroll in this course unless they have completed Organizacija građenja I ISVU equivalents: 22364;147445; Proposal made by M.Sc.M.C.E. Časlav Dunović	Remark	This course can be used for final thesis theme
ISVU equivalents: 22364;147445; Proposal made by M.Sc.M.C.E. Časlav Dunović	Prerequisites:	Students cannot enroll in this course unless they have completed Organizacija građenja I
Proposal made by M.Sc.M.C.E. Časlav Dunović	ISVU equivalents:	22364;147445;
	Proposal made by	M.Sc.M.C.E. Časlav Dunović

Study programme	for academic yea	r 2018/2019
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Code WEB/ISVU	23925/184653	ECTS	5.0	Academic year	2018/2019
Name	Prefabricated Structur	res	I		
Status	5th semester - Buildir	na Construction ((Redovni graditeljstvo) - ok	oligatory course	
Teaching mode	Lectures + exercises	(auditory + labo	ratory + seminar + metod	lology + construction)	30+30 (16+0+14+0)
-	work at home		-		90
Teachers	Lectures:mr.sc. Jure C	Galić predavač			
	Lectures:dr.sc. Krunos	slav Pavković dip	ol.ing.građ.		
	Auditory exercises:ur.	.sc. Krunosiav ra ime Serdarević n	ivković dipi.ing.grad.		
	Additory exercises. S.		lay. my. acun.		
Course objectives	Students will acquire	basic knowledge	about prefabricated cons	truction systems and related	construction technologies.
Learning outcomes:	1.present various pre	fabricated struct	ural systems. Level:6,7		<u> </u>
-	2.propose a rational s	structural system	n depending on the occupa	ancy of the building. Level:6,7	
	3.draw required struct	tural elements o	f the building. Level:6		- 1
	4.propose assembly n 5.propose technology	nethod and orga (for the fabricati	inisation of assembly work	., and select assembly device:	5. Level:6,7
	s.propose teernology		on or screecting ciefficities.	2000,7	
Methods of carrying	Real life diagrams rela	ating to the desid	gn, fabrication and assem	bly work, are presented throu	gh drawings, photographs
out lectures	and video recordings.	-		· ·	
Methods of carrying	Group problem solvin	g			
out auditory	Other Dress station of struct				
exercises Mothoda of comular	Presentation of struct	ures via drawing	js, with explanations.		
out seminars	Other	y			
	Students are required	l to prepare a se	minar paper for a selected	l building, including photogra	phs and drawings.
Course content	1.Introduction, 2h, Le	arning outcomes	3:1		
lectures	2.Industrial constructi	ion techniques: a	advantages and shortcomi	ngs, 2h, Learning outcomes:1	<u>.</u>
	3.Pretabricated reinfo	rced concrete st	ructures: Large area syste	ems, skeleton systems, spatia	l systems, and mixed
	4.Systems made of lic	ahtweight concre	ete and brick. 2h. Learning	outcomes:1.2	
	5.Typical prefabricate	ed structures ma	de of steel, wood and artif	icial materials, 4h, Learning c	outcomes:1,2,3
	6.Roofs and facade sy	ystems, 2h, Lear	ning outcomes:1,2		
	7.Glass/steel composi	ite systems. Men	nbrane structures: textile	- steel, 2h, Learning outcome	s:2,3
	8. Residential houses i	based on wood a	and steel, 2n, Learning out	Comes: 1	
	10.Presentation of cor	mpleted structur	res made of concrete. stee	el, and wood . 4h. Learning ou	tcomes:1.2
	11			, , <u>.</u>	
	12				
	13				
	14				
Course content	1.General remarks ab	out subject and	dynamics. Description of a	assigment. , 2h, Learning out	comes:1,5
auditory	2. Preparations for se	minar paper, 4h,	, Learning outcomes:1,2,5		
	3. Selection of structur	re for seminar pa	aper (team work: 5 studen	t teams), 4h, Learning outcor	nes:1,2
	5	Unstruction sites	- field practice, off, Learn	ing outcomes.1,2	
	6				
	7				
	8				
	9				
	11				
	12				
	13				
	14				
	15.				
Course content	1.Seminar paper on a	defined building	g/structure, with relevant o	descriptions, drawings and ph	otographs. The paper will
seminars	be presented to the e	ntire class. The	presentation will be follow	ed by active discussion of stu	dents and lecturers, 10h,
	Learning outcomes:2,	,3,4	12245		
	2.Students presentati	on, 4n, Learning	outcomes:1,2,3,4,5		
	4				
	5				
	6				
	/ 9				
	9				
	10				
	11				
	12				
	13				
	14				
	15.				

Required materials	Basic: classroom, blackboard, chalk
-	Whiteboard with markers
	Overhead projector
	Portable overhead projector
	Video equipment
	Preparation of structural drawings with typical details.
Exam literature	Basic literature:
	1. S. Rex: INDUSTRIJSKI NAČIN GRAĐENJA, Građ. Fak. u Zagrebu, 1981.,
	2. S. Rex: INDUSTRIJSKI NAČIN GRAĐENJA II DIO - MONTAŽNO GRAĐENJE, Građ. Fak. u Zagrebu, 1983.,
	Additional literature:
	1. F. Kind-Barkauskas, B. Kauhsen, S. Polonyi, J. Brandt: CONCRETE CONSTRUCTION MANUAL, Birkhauser E. 2002.
	2. C. Schittich, G. Staib, D. Balkow, M. Schuler, W. Sobek: GLASS CONSTRUCTION MANUAL, Birkhauser Edition Detail,
	1998.
	3. T. Herzog, R. Krippner, W. Lang: FACADE CONSTRUCTION MANUAL, Birkhauser Edition Detail, 2004.
	4. G. Pfeifer, R. Ramcke, J. Achtiger, K. Zilch: MASONRY CONSTRUCTION MANUAL, Birkhauser Edition Detail, 2001.
	5. Klaus-Michael Koch: BAUEN MIT MEMBRANEN, Izdavač: Prestel Verlag, 2004, ISBN: 3-7913-3048-9
Students obligations	Seminar paper. Maximum of 3 absences from exercises.
Knowledge	Seminar paper.
evaluation during	
semester	
Knowledge	Written part of the examination consists of five questions.
evaluation after	Oral part of the examination may be taken by students that obtained at least 60 percent of points during the written
semester	examination.
Student activities:	Aktivnost ECTS
	(Activity in class) 1
	(Oral exam) 2
	(Written exam) 2
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have passed Betonske konstrukcije I
	Students cannot enroll in this course unless they have completed Metalne konstrukcije
	Students cannot enroll in this course unless they have completed Drvene konstrukcije
	Students cannot enroll in this course unless they have passed Matematika II
	Students cannot enroll in this course unless they have completed Betonske konstrukcije II
ISVU equivalents:	22387;155946;

Code WEB/ISVU	23952/184765	ECTS	5.0	Academic year	2018/2019
Name	Project Management ar	nd Legislation			
Status	5th semester - Manage	ment in Civil Engineering	g (Redovni graditeljstvo)	 obligatory course 	
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + s	eminar + metodology +	construction)	30+30 (16+0+14+0) 90
Teachers	Lectures:1. mr.sc. Peta Lectures:2. v.predavač Auditory exercises:mr.s Auditory exercises: Dor Seminar exercises:mr.s Seminar exercises: Dor	r Adamović prof.v.škole Boris Uremović dipl.ing.g sc. Petar Adamović prof.v nagoj Šojat struč.spec.in sc. Petar Adamović prof.v nagoj Šojat struč.spec.in	građ. /.škole g.aedif. /.škole g.aedif.		
Course objectives	The aim of the course i from the idea to the co	s to teach students to pe mpletion of the project, a	erform all activities neede all in accordance with pre	ed for the management of evailing regulations.	of construction projects,
Learning outcomes:	1.analyse all phases of 2.list required documer 3.anticipate participant 4.organise procuremen 5.make preparations fo 6.plan site-documentat 7.manage a building co	a building construction p ntation and documents n is and processes in indivi t of all necessary permit ir the purchase and contr ion management. Level: instruction process. Leve	project. Level:6 eeded in individual phas dual phases of a project. s (location permit, buildir racting. Level:6,7 6,7 l:6,7	es of a project. Level:6 Level:6,7 ng permit, use permit).	. Level:6,7
Methods of carrying out lectures	Ex cathedra teaching Case studies Discussion Questions and answers Other Appropriate teaching a	ids (video projector and d	computer) are used as ne	eeded during the lecture	s.
Methods of carrying out auditory exercises	Group problem solving Discussion, brainstormi Other Administrative docume commented on.	ing nts and documentation r	elating to completed stru	uctures/projects are pres	ented, explained and
Methods of carrying out seminars	Group problem solving Data mining and knowl Discussion, brainstormi Other The final result of audit	edge discovery on the W ing ory exercises is the sem	'eb inar paper.		
Course content lectures	1.Introduction, terms, c 2.Construction regulati 3.Sudionici u projektu , 4.Systemic approach, c 5.Activities for the deliv 6.Location permit, inve 7.Technical documenta 8. Procurement and aw 9.Construction site doc 10.Financial documents 11.Technical supervisio 12.Final account , 2h, L 13.Technical supervisio 14.Safety at work, safe 15.Quality assurance, 2	definitions, 2h, Learning of ons, regulations aimed a 2h, Learning outcomes: construction as a project, very of the location perm stment study, decision, 2 tion, building permit, 2h, ard of works, 2h, Learnir uments, 2h, Learning out s and payment of work , on, inspections, 2h, Learn ty measures , 2h, Learning the measures , 2h, Learning 2h, Learning outcomes:1,	butcomes:1 t protecting public interes 2h, Learning outcomes: th, Learning outcomes:3, Learning outcomes:2,3, ng outcomes:5 tcomes:2,3,4,6 2h, Learning outcomes:2 ing outcomes:7 hing outcomes:4,5,6 ng outcomes:1,2 2,7	est, 2h, Learning outcome 1,2,3,4 es:3 ,4 4 2,3,4,6	es:1,2
Course content auditory	1. Topics and elements 2.administrative docum 3. preliminary investiga 4. preliminary investiga 5. investment documen 6. investment documen 7. location permit, 1h, L 8. building permit, 1h, L 9. site documents, 1h, L 10. site documents, 1h, 11. site documents, 1h, 12. as-built documents, 13. as-built documents, 14. as-built documents, 15. operating permit, 1h	relating to the field of pr nents and documentation tions, 1h, Learning outco tions, 1h, Learning outco ts, 1h, Learning outcome ts, 1h, Learning outcomes: earning outcomes:2,3 .earning outcomes:2,3,4, Learning outcomes:6 1h, Learning outcomes:1 1h, Learning outcomes:1 1h, Learning outcomes:1 1h, Learning outcomes:1 1h, Learning outcomes:1 1h, Learning outcomes:1 1h, Learning outcomes:1	oject management, 1h, L h, 1h, Learning outcomes imes:3 imes:3,6 is:2,3 is:2,3 6 5,6 5,6 5,6	earning outcomes:1,2 :1,2	
Course content seminars	1.Students make and p outcomes:1,2,3,4,5,6,7 2.Students make and p outcomes:1,2,3,4,5,6,7 3.Students make and p outcomes:1,2,3,4,5,6,7 4.Students make and p outcomes:1,2,3,4,5,6,7	resent seminars with top resent seminars with top resent seminars with top resent seminars with top	pics from building codes a bics from building codes a bics from building codes a bics from building codes a	and regulations, 1h, Lear and regulations, 1h, Lear and regulations, 1h, Lear and regulations, 1h, Lear	ming ming ming ming

Name Public Roads 1 Status Chi sensetz: Undegraduate professional study in civil engineering (Redowi gradie (stud)biligatory cours Teaching mode Lottures + exercises (auditory + laboratory + seminar + metabology + construction) 30+20 (12+0+0+13) Teachers Lottures + exercises (auditory + laboratory + seminar + metabology + construction) 30+20 (12+0+0+13) Construction exercises: Sandra Mihaina: maging and! Construction exercises: Sandra Mihaina: maging and! Construction exercises: Sandra Mihaina: maging and! Course objectives The course is branded to provide basic theoretical and practical knowledge about the design, construction and Learning outcomes: Landyros gate in which the road structure is designed, and difter input parameters for geometry calculation. Level 6 Learning outcomes: Landyros gate in which the road structure is designed, and difter input parameters for geometry calculation. Level 6 Learning outcomes: Landyros gate in which the road structure is designed, and difter input parameters for geometry calculation. Level 6 Learning outcomes: Landyros gate in which the road structure is designed, and difter input parameters for geometry calculation. Level 6.7 Jaradamia design work for a read structure. Level 6.7 Readored design. Level 6.1 Design of parabolis for roads as show via an overhead projector. Methods of carrying	Code WEB/ISVU	23928/184720	ECTS	5.0	Academic year	2018/2019
Status (th. semister. Undergraduate professional study in civil engineering (Redowing reading): -> ->>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	Name	Public Roads I		•		
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4. Making road axis in plan with ACAD tool, 21, Learning outcomes. 3,4	I	4.Making road axis in p	plan with ACAD tool, 2h, l	_earning outcomes:3,4		

	5.Making road axis in plan with ACAD tool, 2h, Learning outcomes:3,4
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	Creating the vertical projection of the road with ACAD tool, 1h, Learning outcomes:3,4
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Required materials	Basic: classroom, blackboard, chalk General purpose computer laboratory Whiteboard with markers Overhead projector Video equipment
Exam literature	1. Korlaet, Ž.; Uvod u projektiranje i građenje cesta, udžbenik, Sveučilište u Zagrebu, Zagreb 1995. g. 2. Dragčević, V., Korlaet, Ž. Osnove projektiranja cesta, Sveučilište u Zagrebu, Zagreb 2003.
Students obligations	maximum of 3 absences from exercises
Knowledge evaluation during semester	Regular attendance#10#0#50\$, numerical tasks#1#50#50\$, theoretical issues#1#50#50\$Program Task#1#0#100\$
Knowledge evaluation after semester	Assignment: Preliminary design for a road (shortened version) Written part of the examination consists of 5 questions relating to matters presented during the course and exercises. Oral part of the examination may be taken by candidates who obtained at least 60 percent of points at the written part of the examination.
Student activities:	AktivnostECTS(Classes attendance)1(Written exam)2(Oral exam)2
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot pass this course unless they have passed Geodezija Students cannot enroll in this course unless they have passed Nacrtna geometrija u graditeljstvu II Students cannot enroll in this course unless they have completed Geodezija
ISVU equivalents:	22355;155928;
Proposal made by	Ph.D.Asst.Prof.C.E. Miroslav Šimun, 22.2.2016

Code WEB/ISVU	23432/155929	ECTS	5.0	Academic year	2018/2019
Name	Public Roads II				
Status	5th semester - Civil En	gineering (Water and tr	affic infrastructur	e) (Redovni graditeljstvo) - ob	ligatory course
Teaching mode	Lectures + exercises (a	auditory + laboratory +	seminar + meto	dology + construction)	30+30 (10+0+0+20)
	work at home				90
Teachers	Lectures:doc.dr.sc. Min	oslav Simun dipl.ing.gra	ađ.		
	Auditory exercises: Sar	dr sc. Miroslav Šimun (ling građ		
	Construction exercises	: Sandra Mihalinac mac	i.ing.aedif.		
	Construction exercises	:doc.dr.sc. Miroslav Šim	nun dipl.ing.građ.		
Course objectives	Students will acquire e	xtensive theoretical an	d practical knowle	edge about road construction a	and maintenance activities.
Learning outcomes:	1.classify soil materials	s in which earthworks a	re carried out. Le	vel:6,7	
	2.calculate earthwork of a draw systems for the	quantities and transpor	t distances. Level	:6	ns Lovalia
	4.protect crown of an i	nfrastructure facility by	walls. Level:6	s, and slope protection system	IS. Level.0
	5.conduct earthworks f	for infrastructure faciliti	es. Level:6,7		
	6.organize realization of	of earthworks. Level:6,7			
	7.classify layers and ty	pe pavement structure	. Level:6,7		
Methods of carrying	Ex cathedra teaching				
out lectures	Case studies				
	Demonstration				
	Modelling				
	Discussion				
	Lectures will be conduc	, cted as oral presentatio	ns which will be il	llustrated with real on-site exa	mples. At that, an
	emphasis will be place	d on evaluation of such	examples. Appro	priate teaching aids (overhead	d projector, video
	projector) will be used	to facilitate understand	ling of topics pres	ented during the course.	
Methods of carrying	Group problem solving				
exercises	other				
How construction	Other				
exercises are held	Students will independ	ently prepare a prelimi	nary design for a	road, examinate slope stability	y and create a plan of
	culvert.				
Course content	1.Basic concepts - inro	duction, 2h, Learning o	utcomes:1,6		
lectures	3. Methods of soil classi	ification, 2h, Learning outco	utcomes:1		
	4.Previous works in the	construction of roads,	2h, Learning outo	comes:1	
	5.Choice of slope inclin	ation and slope protect	tion, 2h, Learning	outcomes:1,4	
	6.Making cut and kerf,	2h, Learning outcomes	:1,2		
	8.Control test and crite	eria. 2h. Learning outcon	mes:5		
	9.Surface drainage, 2h	, Learning outcomes:3			
	10.Underground draina	age, 2h, Learning outco	mes:3		
	11.Culvert, 2h, Learnin	g outcomes:3	l oprning outcome		
	13.Types of support structures a	ructures -Walls. 2h. Lea	rning outcomes:4	.5	
	14.Mass calculacion, ba	alance and transport, 2	h, Learning outco	mes:2	
	15.Making pavement s	tructure, 2h, Learning o	outcomes:7		
Course content	1 Introduction, tack div	vision and interpretation	of characteristic	transverse profiles 2h Lear	ing outcomocil
auditory	2.No lessons. 2h	ision and interpretation		transverse promes , 21, Lean	ing outcomes.1
, , , , , , , , , , , , , , , , , , ,	3.No lessons, 2h				
	4.No lessons, 2h	C I I I'			
	5. Interpreting the Geo	Slope and creating a no	ormal cross-profile	e , 2h, Learning outcomes:2	
	7.No lessons, 2h				
	8.No lessons, 2h				
	9.Interpretation draftin	g culvert, 2h, Learning	outcomes:3		
	10.No lessons, 2h 11 No lessons, 2h i eau	rning outcomes:6			
	12.Interpretation of the	e calculation masses lin	e, 2h, Learning ou	utcomes:2	
	13.No lessons, 2h		-		
	14.Interpretation making	ng of technical descript	ion and how to su	bmit a programme, 2h, Learn	ing outcomes:6
	15.NO lessons, 2h				
Course content	1.No lessons, 2h				
constructures	2.Creating characterist	ic transverse profiles ,	2h, Learning outc	omes:2	
	3.Creating characterist	ic transverse profiles ,	2h, Learning outc	omes:2	
	4.Creating characterist	ic transverse profiles ,	2n, Learning outc	omes:2	
	6.Calculation a slope st	tability of embankment	s. 2h. Learning o	itcomes:1.5	
	7.Calculation a slope st	tability of cut, 2h, Learr	ning outcomes:1,5		
	8.Creating normal tran	sverse profile, 2h, Lear	ning outcomes:1,	5	
	9.No lessons, 2h	ulvert 2h Learning out	comes:3		
	11.Creating a longitudi	nal section of culvert. 2	2h, Learning outco	omes:3	
1	I				

	12.No lessons, 2h				
	13.Creating a mass line, 2n, Learning outcomes:2 14.No lessons, 2h				
	15.Control and delivery of programs, 2h, Learning outcomes:6,7				
Required materials	Basic: classroom, blackboard, chalk General purpose computer laboratory Whiteboard with markers Overhead projector Video equipment				
Exam literature	Basic literature: 1.Dragčević, V., Rukavina, T., Donji ustroj prometnica, Sveučilište u Zagrebu, Zagreb 2006. 2.Dragčević, V., Korlaet, Ž. Osnove projektiranja cesta, Sveučilište u Zagrebu, Zagreb 2003. Additional literature: 1.Opći tehnički uvjeti za radove na cestama, Hrvatske ceste i Hrvatske autoceste, Zagreb, 2001 god. 2.Tehnički uvjeti za asfaltne kolnike, Hrvatske ceste, Zagreb 2015.				
Students obligations	s maximum of 3 absences from exercises				
Knowledge evaluation during semester	Regular attendance#10#0#50\$, theoretical issues#2#100#60\$Program task#1#0#100\$				
Knowledge evaluation after semester	Preparation of an assignment. Written part of the examination consists of 5 questions relating to topics covered during lectures and exercises. Oral part of the examination (may be taken only by students who acquired at least 60 points during the written part of the examination)				
Student activities:	AktivnostECTS(Classes attendance)1(Written exam)2(Oral exam)2				
Remark	This course can be used for final thesis theme				
Prerequisites:	Students cannot enroll in this course unless they have completed Ceste I Students cannot enroll in this course unless they have passed Matematika II Students cannot enroll in this course unless they have passed Proračun konstrukcija Students cannot enroll in this course unless they have completed Hidrologija i hidraulika Students cannot pass this course unless they have passed Ceste I				
ISVU equivalents:	22371;				
Proposal made by	Miroslav Šimun, Ph.D.Asst.Prof.C.E., 22.6.2016				

Code WEB/ISVU	23476/155986	ECTS	6.0	Academic year	2018/2019	
Name	Railways		•			
Status	6th semester - Civil Eng	gineering (Water and tra	ffic infrastructure) (Redo	vni graditeljstvo) - obliga	atory course	
Teaching mode	Lectures + exercises (a work at home	uditory + laboratory + s	seminar + metodology +	construction)	30+45 (6+0+0+39) 105	
Teachers	Lectures:1. mr.sc. Ante	Goran Baiić viši predava	ač		100	
	Auditory exercises:mr.s	sc. Ante Goran Bajić viši	predavač			
	Construction exercises:	mr.sc. Ante Goran Bajić	viši predavač			
Course objectives	Students will acquire th	eoretical, practical and	operative knowledge abo	out the construction and	maintenance of	
	railways and railway sy	stems, and will visit maj	or railway construction s	ites, plants and facilities		
Learning outcomes:	1.analyse basic probler	ns in the organisation of	railway transport and op	peration of railways. Leve	el:6	
	forces and stresses in t	he track Level.6			LKS WILL ALL ACCENT ON	
	3.otkriti osnovne eleme	ente želiezničke pruge, p	raktična znania za građe	nie i održavanie želiez. r	oruga. Level:6.7	
	4.identify special struct	ures in the track (turnou	its) types, differences an	d problems in use. Level	:6	
	5.calculate unannulled lateral acceleration, superelevation in curves, and transition ramp lengths in transition curves.					
	Level:6					
	scale of 1:500. Level:6			, and draw a working dra	wing of stakeout on the	
	7.calculate factor of sal	fety for vehicle passing t	hrough a curve of given	horizontal elements. Lev	el:6	
	8.calculate all track tur	ning elements and make	e a stakeout drawing. Lev	/el:6		
Methods of carrying	Other					
out lectures	recorder) and visit of n	ring which appropriate to	eaching alds are used (si	ide projector, overnead	projector and video	
Methods of carrying	Other		n sites and plants.			
out auditory	Instructions, numerical	examples, and regulation	ons.			
exercises		· · · · · · · · · · · · · · · · · · ·				
How construction	Other					
exercises are held	students independently	solve problems for the	assignment.			
Course content	1.Forces acting on the	track (static and dynami	c - vertical and horizonta	I), introduction to calcul	ation of permanent way,	
lectures	Winkler, assumptions, I	oad diagram, dynamic c	oefficient, subbase coeff	icient - c), 2h, Learning (c): 1 Pails: Pail testing	utcomes:3 Oulaity pombor K. Pails	
	in use. Continuous dyna	amic tensile strength of	steel. Breakdown. Fatigu	e. Wear (vertical, lateral	, undulating, folded).	
	grease guns, 2h, Learni	ing outcomes:3	j-		,	
	3.2. Rail accessories: To	echnical, operational, ec	onomic and other proper	ties of rail accessories. T	esting technical	
	properties of connectio	n accessories. Testing te	chnical parameters of g	ued insulating joints, 2h	, Learning outcomes:3	
	4.3. Sieepers: Assignme	ents. Classification accor	aing to structural solutions.	n and material. Lests, st	andards and byelaws	
	5.4. Ballast: Thickness.	Calculation. Stress diag	ram (sleeper - formation)). Ballast quality testing.	Tests, standards and	
	byelaws used by Croati	an Railways, 2h, Learnin	g outcomes:3			
	6.Turnouts: Classification	on of turnouts. Contour o	lrawings of simple turno	uts. Parts. Geometrical re	alationships, 2h,	
	Learning outcomes:4	when Calavilation of human	ut commentions. Oh loos			
	8 First preliminary exar	n 2h	ut connections., 211, Lear	ning outcomes:4		
	9. Track layout in straig	tht line and in curve. (Tra	ack in straight line regula	ations. Track in curve reg	ulations). Derivation of	
	non-annulled lateral ac	celeration for high-speed	d railways. Track directio	n regulations., 2h, Learn	ing outcomes:5	
	10.Works on track and	systematisation of work	s. Classification of regula	r works. Works on geom	etry. Works on	
	replacement. Big works	6 (overnaul) organisation nd organisation (ballast	and layout plan of railw	ay repair sned., 2n, Lear Repair of truck substrue	ning outcomes:1,5	
	replacement. Replacem	nent train. Track mainter	ance works., 2h, Learnir	ng outcomes:1,5	and changes for	
	12.Track welding. ET-w	eld. Welding machine. P	hases of work. Weld test	ing. Advantages and sho	rtcomings. AT-weld.	
	Chemical analysis. Pha	ses of work. Weld testing	g. Advantages and short	comings. Comparison of	AT and ET welds in	
	actual use., 2h, Learnin	ig outcomes:2 rail (DT): Advantages an	d realization requiremen	te History Forces and st	rossos in DT	
	Temperature in DT. Crit	tical and safe temperatu	re. Breathing end of DT.	Track release. Longitudi	nal resistance - p.	
	Lateral resistance - w.	Three methods for allevi	ating internal stress from	o continuous rails (track	ifting)., 2h, Learning	
	outcomes:2					
	14. Special railways. Int	troduction. Funiculars. R	ack railways. Aerial rope	ways. Steel wire cable. S	piral cable. Ribbon	
	15.Second - final prelim	ninary exam. 2h	granns., zn, Leanning out	comes.4		
		· ·				
Course content	1.Instructions, numeric	al examples and regulat	ions for solving problems	s in the scope of structur	al exeTurnouts:	
auditory	Classification of turnou	ts. Contour drawings of s	simple turnouts. Parts. G	eometrical relationships.	Calculation of turnout	
	2 Instructions numeric	Learning outcomes:6	ions for solving problems	in the scope of structur	al evercises 2h	
	Learning outcomes:7	ai examples and regulat	ions for solving problems	s in the scope of structur	ui exercises , 211,	
	3.Instructions, numeric	al examples and regulat	ions for solving problems	s in the scope of structur	al exerciseTrack layout	
	in straight line and in c	urve. (Track in straight li	ne regulations. Track in	curve regulations). Deriv	ation of non-annulled	
	lateral acceleration for	high-speed railways. s. ,	2h, Learning outcomes:	8		
	4 5					
	6					
	7					
	8					
	9 10					
I	I					

	11
	12
	14
	15
Course content constructures	 1.1. Each student is given a different assignment and is required to independently rehabilitate the existing turnout links in full accordance with regulations applied by Croatian Railways., 3h, Learning outcomes:6 2.1. Each student is given a different assignment and is required to independently rehabilitate the existing turnout links in full accordance with regulations applied by Croatian Railways., 3h, Learning outcomes:6 3.1. Each student is given a different assignment and is required to independently rehabilitate the existing turnout links in full accordance with regulations applied by Croatian Railways., 3h, Learning outcomes:6 4.1. Each student is given a different assignment and is required to independently rehabilitate the existing turnout links in full accordance with regulations applied by Croatian Railways., 3h, Learning outcomes:6 5.1. Each student is given a different assignment and is required to independently rehabilitate the existing turnout links in full accordance with regulations applied by Croatian Railways., 3h, Learning outcomes:6 6.1. Each student is given a different assignment and is required to independently rehabilitate the existing turnout links in full accordance with regulations applied by Croatian Railways., 3h, Learning outcomes:6 6.1. Each student is given a different assignment and is required to independently rehabilitate the existing turnout links in full accordance with regulations applied by Croatian Railways., 3h, Learning outcomes:6 7.2. Relocation of station tracks from zone /a/ to zone /b), with the scale 1:500 stakeout plan , 3h, Learning outcomes:8 8.2. Relocation of station tracks from zone /a/ to zone /b), with the scale 1:500 stakeout plan , 3h, Learning outcomes:8 9.2. Relocation of station tracks from zone /a/ to zone /b), with the scale 1:500 stakeout plan , 3h, Learning outcomes:8 10. Rehabilitation of existing curves to enable higher speeds of travel , 3h, Learn
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Overhead projector Portable overhead projector Video equipment
Exam literature	Basic literature: 1. Stipetić, A.: Gornji ustroj željezničkoga kolosijeka, FPZ, Zagreb, 2008. 2. Pollak, B.: ŽELJEZNICE, Građevinski institut, FGZ, Zagreb, 1988. 3. Bajić, A.G.: Separati predavanja.
	Additional literature: 1. P-314 PRAVILNIK O GORNJEM USTROJU, Hrvatske željetnice, Zagreb 2. P-315 PRAVILNIK O DONJEM USTROJU, Hrvatske željeznice, Zagreb
Students obligations	maximum of 3 absences from exercises
Knowledge evaluation during semester	Redovitost pohaa#20#0#80\$Kolokvij, teorijska pitanja#2#100#50\$Programski zadatak#4#0#100\$
Knowledge	5th Semester: assignment submittal is a precondition for second signature
evaluation after	6th Semester: assignment submittal is a precondition for second signature written part of the examination (theory) and solution to the numerical assignment (turnout link calculation) after the
semester	6th semester oral part of the examination (may be taken only by students who acquired at least 60 points during the written part of the examination)
Student activities:	Aktivnost ECTS (Project) 6
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have completed Osnove željeznica Students cannot pass this course unless they have passed Osnove željeznica
ISVU equivalents:	22370;

Study programme	for academic	year 2018/2019
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Code WEB/ISVU	23460/155969	ECTS	5.0	Academic year	2018/2019
Name	Regulation and Amelio	ration Drainage		•	-
Status	5th semester - Civil En	gineering (Water and tr	affic infrastructure) (Red	ovni graditeljstvo) - obli	gatory course
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory +	seminar + metodology -	+ construction)	30+30 (8+0+0+22) 90
Teachers	Lectures: Ivana Bartoli	ć , pred.			
	Lectures:dr.sc. Mladen	Petričec dipl.ing.građ.			
	Auditory exercises: Fili	p Kalinić mag. ing. aedi ian Kovačović dinl ing g	i. rađ		
	Construction exercises	:: Filip Kalinić mag. ing. a	aedif.		
	Construction exercises	: Dejan Kovačević dipl.i	ng.građ.		
Course objectives	Students will learn bas	ic operating principles f	or systems and structure	es used in watercourse r	egulation and drainage
	improvement practices	s, and will be able to cor	nduct basic hydraulic cal	culations.	
Learning outcomes:	1.analyze the basic cha 2 prepare basic bydrol	aracteristics of water re- onical data for the design	gulation. Level:6 in of water control struct	ures Level:67	
	3.calculate the basic h	ydraulic parameters of v	water control and structu	ires. Level:6	
	4.identify the basic cor	mponents of hydro-tech	nical amelioration. Level	:6	
	5.prepare a basis for the	he design of hydro-tech	nical amelioration. Level:	6,7	
	b.calculate the parame	eters of simple menorati	on drainage system and	Ingation. Levelto	
Methods of carrying	Ex cathedra teaching				
out lectures	Case studies				
	Discussion	_			
	Questions and answers	5			
	Issues are explained by	y presentation of numer	ous examples, from pho	tographs of structures, o	design drawings,
	sketches, diagrams an	d graphs. Lectures are p	performed with aid of vid	eo and overhead projec	tors and the blackboard.
	Printoffs are handed ou	ut; lecture sketches are	available via the interne	t. During lectures, stude	ints are invited to ask
Methods of carrying	Discussion brainstorm	ing			uns.
out auditory	Workshop	inig			
exercises	Other				
	Instructions for segme	nts of individual program	n preparation.		
How construction	Traditional literature and know	nalysis Iodgo discovery on the V	Nob		
exercises are lielu	Workshop	ledge discovery off the	WED		
	Other				
	Students independentl	y prepare a program, ui	nder lecturer		
Course content	1.Purpose, problems a	nd objective of regulation	on, role of regulation in w	ater management , 1h,	Learning outcomes:1
lectures	2. River bed morphology	, In, Learning outcomes	es:1		
	Hydrological character	istics of natural waterco	urses, water regime, sec	diment regime, ice regin	ne, 1h, Learning
	outcomes:1,2	с			
	3.Hydraulic calculation	is for natural and artifica	al watercourses; flow cal	culations, sediment tran	sport, bed stability , 2h,
	4.Hydraulic calculation	Is for natural and artifica	al watercourses; flow cal	culations, sediment tran	sport, bed stability , 2h,
	Learning outcomes:1,2				
	5.Hydraulic calculation	is for natural and artifica	al watercourses; flow cal	culations, sediment tran	sport, bed stability , 1h,
	Regulation works on w	, atercourse bed, regulat	ion structures , 1h, Learr	ning outcomes:3	
	6.Regulation works on	watercourse bed, regula	ation structures , 2h, Lea	rning outcomes:3	
	7.The protection and d	efense of river flooding,	2h, Learning outcomes:	3	
	9.Amelioration drainag	ie demands, purpose, ol	piective. 1h. Learning out	tcomes:4	
	Surface drainage, prec	onditions and demand ,	1h, Learning outcomes:	4	
	10.Amelioration draina	ige canals, main geome	trical and hydraulic elem	ents , 1h, Learning outc	omes:4,5
	Determination of crop- outcomes:2	imgation requirement a	ind total flow, sizing of a	melloration drainage ca	hais , In, Learning
	11.Structures on ameli	ioration drainage canals	and road network, 1h, L	earning outcomes:4,5	
	Technology of construct	ction of surface amelior	tion drainage systems ,	1h, Learning outcomes:	4,5
	12.Subsurface drainag	e, preconditions and de	mand , 1h, Learning outo	comes:5	
	13.Main geometrical a	nd hydraulic elements o	f subsurface drainage sy	stems , 1h, Learning ou	tcomes:5
	Materials and technolo	gy of construction of su	bsurface amelioration dr	ainage systems, 1h, Lea	rning outcomes:5,6
	14.Types and methods	s of irrigation systems. S	tandard and crop-irrigati	ion requirement , 1h, Le	arning outcomes:5,6
	15.II. preliminary exam	n. 2h. Learning outcome	s:4.5.6	icomes.5,0	
			· - · -		
Course content	1.Instructions for maki	ng the task of regulation	n of watercourses., 2h, Le	earning outcomes:1,2,3	
auditory	2.Instructions for making	ng the task of regulation	n of watercourses, 2h, Le	earning outcomes:1,2,3	
	4.No lessons.				
	5.No lectures.				
	6.No lectures.				
	1.NO lectures.	ng the task of ameliorat	ion., 2h. Learning outcor	nes:4.5.6	
	9.Instructions for maki	ng the task of ameliorat	ion., 2h, Learning outcor	nes:4,5,6	
I	1		J		

	10.No lectures.
	11.No lectures.
	12.No lectures.
	13.No lectures.
	14.No lectures.
	15.No lectures.
Course content	1.No lectures.
constructures	2.No lectures.
	3.No lectures.
	4.No lectures.
	5.Hydraulic calculation for boundary canal bed, 2h, Learning outcomes:1
	6.Hydraulic calculation for boundary canal bed, 2h, Learning outcomes:1
	7.Explanation and completion of the task., 2h, Learning outcomes:1,2,3
	8.No lessons.
	9. No lessons.
	10. Making the task of amelioration., 2h, Learning outcomes:4,5,6
	11.Making the task of amelioration., 2h, Learning outcomes:4,5,6
	12.Making the task of amelioration., 2h, Learning outcomes:4,5,6
	13.Making the task of amelioration., 2h, Learning outcomes:4,5,6
	14.Making the task of amelioration., 2h, Learning outcomes:4,6
	15.Explanation and completion of the task, 2h, Learning outcomes:4,5,6
Required materials	Basic: classroom, blackboard, chalk
	General purpose computer laboratory
	Whiteboard with markers
	Overhead projector
	Video equipment
Exam literature	Basic literature:
	1. Priručnik za hidrotehničke melioracije I. Kolo, knjiga 3, Osnovna mreža, površinska odvodnja; knjiga 4, Detaljna
	mreža, podzemna odvodnja; knjiga 5, Građenje sustava površinske i podzemne odvodnje
	2. Zivko Vuković: Osnove hidrotehnike, Prvi dio, druga knjiga
	Additional literature:
	1. josip Marušić: Separati iz površinske i podzemne odvodnje i navodnjavanja
Students obligations	Regular attendance and achieved results of prelim and favorably rated programs.
Knowledge	Regular attendance and achieved results of prelim and favorably rated programs. All students achieved the conditions
evaluation during	for the signature to be placed on the final exam.
semester	
Knowledge	The exam consists of written and oral part.
evaluation after	For the oral exam required to achieve 60% success in the written part of the exam
semester	
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have completed Vodogradnje
	Students cannot enroll in this course unless they have passed Osnove hidrologije i hidraulike
	Students cannot enroll in this course unless they have passed Matematika II
	Students cannot enroll in this course unless they have passed Proracun konstrukcija
	Students cannot enroli in tris course unless triey nave completed Hidrologija i hidraulika
	Students cannot pass this course unless they have passed voldogradinje
	Scudents cannot pass this course unless they have passed fildfologija i fildfaulika
ISVU equivalents:	22373;
Proposal made by	Docent Danko Holjević, Docent Danko Biondić 28.09.2015.

Code WEB/ISVU	23462/155971	ECTS	6.0	Academic year	2018/2019	
Name	River Engineering					
Status	6th semester - Civil and	d Environmental Enginee	ering (Redovni graditeljst	vo) - obligatory course		
Teaching mode	Lectures + exercises (a work at home	auditory + laboratory + s	seminar + metodology +	construction)	30+45 (21+0+9+15) 105	
Teachers	Lectures:1. dr.sc. Mlade Lectures: Ivana Bartolio Auditory exercises: Iva Seminar exercises: Iva Construction exercises Construction exercises	en Petričec dipl.ing.građ. ć , pred. na Bartolić , pred. na Bartolić , pred. :dr.sc. Darko Barbalić dip : Ivana Bartolić , pred.	bl.ing.građ.			
Course objectives	Previously acquired kno inland water ecology, a students to implement needs in terms of the u effects of water, such a	owledge in hydrology, hy and other traditional civil engineering solutions or use and protection of nat as floods, water-caused s	vdrogeology, psammolog engineering disciplines, n natural watercourses in ural watercourses and th coil erosion, undesirable	y, river morphology, env will be correlated and ex accordance with the so heir lowlands, and protect sediment deposits, etc.	vironmental protection, xtended so as to enable cietys demands and tion from adverse	
Learning outcomes:	1.to identify the possib 2.to analyze the basis f 3.calculate the basic hy 4.to determine the flow 5.to evaluate the basic 6.to establish basic me	 1.to identify the possibilities to use natural watercourse Level:6 2.to analyze the basis for the management of natural watercourses Level:6 3.calculate the basic hydrological, morphological and sediment parameters watercourses Level:6 4.to determine the flow regime, sediment transport and morphological changes in watercourse Level:7 5.to evaluate the basic parameters of regulating natural watercourse Level:7 6.to establish basic measures for flood protection along the natural waterways Level:7 				
Methods of carrying out lectures	Ex cathedra teaching Case studies Discussion Questions and answers Lectures are performed visit to different structu	s d orally, in a lecture roon ures on watercourses is p	n, with use of modern IT planned.	equipment. As a part of	auditory exercises, a	
Methods of carrying out auditory exercises	Group problem solving Discussion, brainstorm Computer simulations Solving exercises on th	ing e blackboard, with acitve	e student participation.			
Methods of carrying out seminars	Workshop Other					
How construction exercises are held	Group problem solving Traditional literature ar Data mining and knowl Discussion, brainstorm Workshop Preparation of a progra	nalysis ledge discovery on the M ing im in groups, under lectu	/eb ırer			
Course content lectures	1.Introduction to the co Definitions, scope and 2.Conditions and aspec 3.Methods for collectin 4.Hydrological, morpho 5.Hydraulic calculation 6. Use of model in the 7.Improvement and reg 8.Improvement and reg 9.1. preliminary exam, 10. Regulation of flow a 11. Hydraulic structure 13.High water level ma 14.High water level ma Multipurpose water sys 15.II. preliminary exam Repeated I. or II. prelim	principles of river engine principles of river engine its of river use., 2h, Lean g data on hydrological an ological, ecological and o s and analysis., 2h, Lean analysis of flow along na gulation of natural water gulation of natural water 2h, Learning outcomes:1 and water level in natura s in river engineering., 2 s in river engineering., 2 s in river engineering., 2 inagement and flood pro inagement and flood pro tetms., 1h, Learning outcomes hinary exam, 2h, Learning	xams., 1h eering., 1h, Learning outco ning outcomes:1 nd morphological proper ther analysis., 2h, Learn rning outcomes:3 tural watercourses., 2h, Learning o courses., 2h, Learning o courses., 2h, Learning o ,2,3 Il watercourses., 2h, Learn h, Learning outcomes:5 h, Learning outcomes:5 h, Learning outcomes:5 tection., 2h, Learning ou tection., 1h, Learning ou set,5,6 g outcomes:1,2,3,4,5,6	comes:1 ties of watercourses., 2h ning outcomes:2 Learning outcomes:3 utcomes:3,4 utcomes:4 rning outcomes:5 tcomes:6 tcomes:6	, Learning outcomes:1	
Course content auditory	1.Introduction to the w Characteristics of naturinterventions., 2h, Lear 2.Hydrological, psamm 3.Calculation of water f 4.Morphologic regulation 5.River reservoirs and routcomes:5,6 6.No lessons. 7.No lessons. 8.No lessons. 9.No lessons. 10.The presentation and 11.No lessons. 12.No lessons. 13.No lessons.	ay the content the mode ral watercourses, river us ming outcomes:1,2 ologic, morphologic mea face and riverbed stabilit ons, modifications and ch retarding basins, use of r	es of implementation exe se conditions and modali surements and data ana cy., 3h, Learning outcome nannel routing. , 3h, Lear river flood retention area n., 2h, Learning outcome	rcises., 1h ities, background informa ilysis., 3h, Learning outc es:3 rning outcomes:4,5 is, flood protection syste s:2,3,4	ation for engineering omes:1,2 ms., 3h, Learning	

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	14.No lessons. 15.The presentation and explanation II. program, 3h, Learning outcomes:4,5,6
Course content	1.No lessons.
semmars	3.No lessons.
	4.No lessons.
	5.No lessons.
	6.Zadavanje i obrazloenje naa rjeavanja i sadraja I. programa., 3h, Learning outcomes:3,4
	7.Zadavanje i obrazioenje naa rjeavanja i sadraja i. programa., in, Learning outcomes:3,4 8 No lessons
	9.No lessons.
	10.Zadavanje i obrazloenje naa rjeavanja i sadraja II. programa, 1h, Learning outcomes:5,6
	11.Zadavanje i obrazloenje naa rjeavanja i sadraja II. programa., 3h, Learning outcomes:5,6
	12.NO lessons
	14.No lessons.
	15.No Lessons.
Course content	1.No lessons.
constructures	2.No lessons.
	3.No lessons.
	4.No lessons.
	6.No lessons.
	7.Working on the I. task., 2h, Learning outcomes:2,3,4
	8.Working on the I. task., 3h, Learning outcomes:2,3,4
	9.Working on the I. task., 3h, Learning outcomes:2,3,4
	11.No lessons.
	12.Working on the II. task., 3h, Learning outcomes:5,6
	13.Working on the II. task., 3h, Learning outcomes:5,6
	14.Working on the II. task., 3h, Learning outcomes:5,6
	IS.NO lessons.
Required materials	General purpose computer laboratory
	Whiteboard with markers
	Overnead projector
Exam literature	Basic literature:
	1. Mladen Petričec: Riječno inženjerstvo - interne skripte, Zagreb 2011.
	12. MIROSIAV ĐUROVIC: REGUIACIJE FIJEKA, TENNICKA KNJIGA, ZAGRED 1967. 13. Zoran Barbalić: Biječna bidrotebnika - regulacije rijeka, skripte, Građevinski fakultet Sarajevo 1989.
	Additional literature:
	1. P. Ph. Jensen i suradnici: Principles of River Engineering, Pitman Pub., London, 1979.
	2. Dragulin Muskaulovic: Regulacije reka, Gradevinski rakultet beograd, 1970. 3. Ven To Chow: Open Channel Hydraulics, MacGraw-Hill, 1959
	4. Ognjen Bonacci: Ekohidrologija vodnih resursa i otvorenih vodotoka, Građevinsko-arhitektonski fakultet, Split, 2003.
Students obligations	Attendance of lectures and exercises. It is necessary to achieve 30 or more points score through activities during the
Kaandadaa	semester (preliminary exams, seminars,).
Knowledge	and less than 30 points score is allowed to write additional test. If student achieve minimum of 30 points score or more
semester	student is allowed to take final exam.
	Student who achieve less than 15 mark points during semester in the next year must enrol the subject again.
Knowledge	Final exam, by which student can achieve 40 points score, is obligatory for all subjects. For a positive final exam
evaluation after	evaluation it is required 20 points score (50%). The final subject mark contains points achieved during the semester
semester	90 - 100 - A
	80 - 89.9 - B
	65 - 79.9 - C
	60 - 649 - D 50 - 59 9 - F
Student activities:	Aktivnost ECTS
	(Constantly tested knowledge) 3
	(Oral exam) 3
Remark	I his course can be used for final thesis theme
Prerequisites:	prodents cannot enroll in this course unless they have completed Hidrologija i hidraulika Students cannot hass this course unless they have hassed Hidrologija i hidraulika
	Students cannot enroll in this course unless they have passed Vodogradnje
	Students cannot enroll in this course unless they have passed Proračun konstrukcija
	Students cannot enroll in this course unless they have passed Matematika II
ISVU equivalents	147447:
Proposal made by	dr.sc. Mladen Petričec, prof. v. šk.



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Code WEB/ISVU	23466/155975	ECTS	5.0	Academic year	2018/2019	
Name	Safety at Work					
Status	6th semester - Manager	ment in Civil Engineering	g (Redovni graditeljstvo)	 obligatory course 		
Teaching mode	Lectures + exercises (a work at home	.ectures + exercises (auditory + laboratory + seminar + metodology + construction)30+30 (10+0+0+20)work at home90				
Teachers	Lectures:dr.sc. Dražen A Lectures: Zdravko Mura Auditory exercises: Zdra Auditory exercises:v.pre Construction exercises: Construction exercises:	Lectures:dr.sc. Dražen Arbutina dipl.ing.arh. Lectures: Zdravko Muratti Auditory exercises: Zdravko Muratti Auditory exercises:v.predavač Boris Uremović dipl.ing.građ. Construction exercises: Zdravko Muratti Construction exercises: v predavač Boris Uremović dipl.ing.građ				
Course objectives						
Remark	This course can not be u	This course can not be used for final thesis theme				
Prerequisites:	Students cannot enroll i	Students cannot enroll in this course unless they have completed Organizacija građenja l				
ISVU equivalents:	147446;					

Code WEB/ISVU	23939/184743	ECTS	2.0	Academic year	2018/2019	
Name	Sociology		·	•		
Status	3rd semester - Unde	rgraduate professi	onal study in civil engin	eering (Redovni graditeljstvo)	 obligatory course 	
Teaching mode	Lectures + exercises work at home	; (auditory + labor	atory + seminar + meto	dology + construction)	15+15 (5+0+10+0) 30	
Teachers	Lectures:mr.sc. Lucij	a Bačić v.pred.				
	Auditory exercises:m	nr.sc. Lucija Bačić v Jatača Uzelac	v.pred.			
	Seminar exercises: m	ir.sc. Lucija Bačić v	.pred.			
	Seminar exercises: N	lataša Uzelac	•			
Course objectives	Understanding and g aspect of work, also	aining knowledge through the relation	about laws, relationship on of people, work and o	is and processes through the organization in society, in theo	economic and sociological ry and practice	
Learning outcomes:	1.identify the fundar 2.analyze theories of organization and soc 3.examine the main modern trends in bu: 4.determine the imp	Lidentify the fundamental theoretical terms, principles and concepts of sociology of work and organization. Level:6 2.analyze theories of labor organization as well as various modern concepts related to the characteristics of work, organization and society. Level:6 3.examine the main characteristics of the labor market and the impact that globalization has on it as well as on the modern trends in business and labor organization. Level:6				
	and human behavior 5.critically analyze m	: Level:7 nodern problems a	nd trends in the field of	work transformation and its o	rganization. Level:7	
Methods of carrying out lectures	Ex cathedra teaching Case studies Discussion Questions and answe	ers				
Methods of carrying out auditory exercises	Group problem solvii Traditional literature Data mining and kno Discussion, brainstor	ng analysis wledge discovery ming	on the Web			
Methods of carrying out seminars	Traditional literature Data mining and kno Essay writing Discussion, brainstor Interpretation and pr	analysis wledge discovery ming resentations of pap	on the Web pers in areas of high inte	erest to students.		
Course content lectures	1.Introductory lectur 2.Defining basic con- outcomes:1,2 3.Historical overview 4.The elements and 5.Structuring of prod 6.Managing Employe 7.1. Preliminary exar 8.Planning, recruitme 9.Motivation and org 10.Compensation and 11.Specificity of worl 12.Ethics and social 13.The dark side of r 14.Globalization and 15.2. Preliminary exa	e, methodology ar cepts and looking of the characteris characteristics of l luction and division res, 1h, Learning ou ent and selecting a anizational behavi d reward system, k in Civil Engineeri responsibility, 1h, nanagement and l modern business am, 1h, Learning o	nd operationalisation lec at work through an ecor stics of work, organizatic abor market, 1h, Learnin n of labor, 1h, Learning o utcomes:2,3,4,5 tcomes:1,2,3,4 applicants, 1h, Learning or, 1h, Learning outcom 1h, Learning outcomes: ng, 1h, Learning outcoms Learning outcomes:4,5 numan behavior, 1h, Lea trends and transformati utcomes:1,2,3,4,5	tures and exercises, 1h, Learn omic and sociological context on of work and society, 1h, Lea ng outcomes:3 outcomes:2,3 outcomes:2,3,4 es:2,3,4,5 2,3,4,5 nes:2,3,4,5 arning outcomes:4,5 on of work, 1h, Learning outcomes	ning outcomes:1 ;, 1h, Learning arning outcomes:2 omes:2,3,4,5	
Course content auditory	1. Group discussion, 1 2.No classes 3.No classes 4.No classes 5.No classes 6. Interpretation prac 7.No classes 9.No classes 10. Interpretation pra 11. Interpretation pra 12. No classes 13. No classes 14. Interpretation pra outcomes: 1, 2, 3, 4, 5 15. No classes	Ih, Learning outco tical examples, gr actical examples, g actical examples, g actical examples, g	mes:1,2,3,4,5 oup discussion and prop roup discussion and pro roup discussion and pro	osals to solve problems, 1h, L posals to solve problems, 1h, posals to solve problems, 1h, posals to solve problems, 1h,	earning outcomes:1,2,3,4,5 Learning outcomes:2,3,4,5 Learning outcomes:2,3,4,5 Learning	
Course content seminars	1.No classes 2.Essay presentation 3.Essay presentation 4.Essay presentation 5.Essay presentation 6.No classes 7.Essay presentation	and group discus and group discus and group discus and group discus and group discus	sion, 1h, Learning outco sion, 1h, Learning outco sion, 1h, Learning outco sion, 1h, Learning outco sion, 1h, Learning outco	mes:1,2 mes:2 mes:2,3 mes:2,3 mes:2,3,4,5		

	 8.Essay presentation and group discussion, 1h, Learning outcomes:2,3,4 9.Essay presentation and group discussion, 1h, Learning outcomes:2,3,4 10.No classes 11.No classes 12.Essay presentation and group discussion, 1h, Learning outcomes:1,2,3,4,5 13.Essay presentation and group discussion, 1h, Learning outcomes:1,2,3,4,5 14.No classes 15.Essay presentation and group discussion, 1h, Learning outcomes:1,2,3,4,5 				
Required materials	Basic: classroom, blackboard, chalk Overhead projector				
Exam literature	Robbins, S. P., Judge, T. A. (2009), Organizacijsko ponašanje, MATE, Zagreb Giddens, A. (2007), Sociologija, Nakladni zavod Globus, Zagreb Beck, U. (2000), The Brave New World of Work, Polity Press, Cambridge				
Students obligations	Attendance 70% of classes and exercises.				
Knowledge	Regularity of attendance and activity in lectures and exercises 15%.				
evaluation during	Presentation of seminar work or essay 15%.				
semester	1. and 2. preliminary exam 70%.				
	Max. 10 points: 10 excellent (5) 8 9 very good (4) 6 7 good (3) 5 sufficient (2) 0 4 fail (1)				
Knowledge	Written exam 70%.				
evaluation atter semester	Max. 10 points: 10 excellent (5) 8 9 very good (4) 6 7 good (3) 5 sufficient (2) 0 4 fail (1)				
Student activities:	Aktivnost ECTS (Classes attendance) 1 (Written exam) 1				
Remark	This course can not be used for final thesis theme				
Prerequisites:	No prereguisites.				
ISVU equivalents:	22343;163659;				
Proposal made by	Lucija Bačić, MSc. senior lekturer				

Code WEB/ISVU	23926/184718	ECTS	5.0	Academic year	2018/2019
Name	Soil Mechanics				
Status	3rd semester - Undergi	raduate professional stu	dy in civil engineering (R	edovni graditeljstvo) - ol	ligatory course
Teaching mode	Lectures + exercises (a	auditory + laboratory + :	seminar + metodology +	construction)	30+30 (0+4+2+24)
	work at home				90
Teachers	Lectures:1. dr.sc. Sonja	a Zlatović , profesor viso	ke škole		
	Lectures:2. mr.sc. Zeljk	ko Lebo v. pred.	6		
	Laboratory exercises:d	r.sc. Sonja Zlatović , pro c. Sonja Zlatović , profes	resor visoke skole		
	Construction exercises	: Ivana Pavlić	UI VISURE SKUIE		
	Construction exercises	dr.sc. Sonja Zlatović , p	rofesor visoke škole		
Course objectives	Understand the soil be	haviour principles and p	epare for solving of geot	echnical problems.	
Learning outcomes:	1.identify soil. Level:6	· · ·		•	
	2.classify soil. Level:6,	7			
	3.calculate effective st	ress in horizontally strat	fied soil without water fl	ow or with vertical flow.	Level:6
	4.estimate settlement	of horizontally stratified	soil due to uniformly dist	ributed load or water lev	/el change. Level:6,/
	6 identify causes of slo	ne instability Level.6		ised on direct shear rest	IIIS. Level:0,7
	7.calculate factor of sa	fety for sliding by using	the infinite slope model o	or GeoSlope software in (different conditions.
	Level:6	, , , ,		·	
	8.estimate stability of a	an infinite slope and slop	e in homogeneous soil. I	_evel:6,7	
	9.identify hazard of hyd	draulic failure of the four	ndation pit bottom. Level	:6	
	10.comment on geoted	chnical report. Level:6			
Methods of carrying	Ex cathedra teaching				
out lectures	Guest lecturer				
	Case studies				
	Demonstration				
	Discussion				
	Questions and answers	;			
	At least a simple overv	iew of a case history is i	used during each lecture	to introduce a problem (with plentiful of
	photographs, videos et	c). Simple models are us	sed to explain processes	in soil. Investigation site	s are visited as well as
	geotechnical laborator	and constructions sites	. Active Learning Critical	Thinking frame is used.	
Methods of carrying	Laboratory exercises o	n laboratory equipment			
out laboratory	Laboratory exercises, o	computer simulations			
exercises	Group problem solving				
Matheda of comulas	Studente prepara comi	nara in taama (2 naraan) and procent them for t	ha whala graun	
out seminars	Students prepare semi	nars in teams (2 persons	and present them for t	ne whole group.	
How construction	Group problem solving				
exercises are held	Students solve individu	ial assignments.			
Course content	1.Role of Soil Mechanic	s. Three phases in soil.,	2h, Learning outcomes:1	.,2	
lectures	2.Pore water: peremea	bility, capillary action, so	oil freezing, pore water p	ressure., 2h, Learning ou	itcomes:2,8
	3.Pore water: flow, bou	yancy, seepage force., 2	h, Learning outcomes:2,	8	
	5 Soil classification and	l indexes 2h Learning	ny outcomes:2,6		
	6.Oedometer and settle	ement in soil., 2h, Learni	na outcomes:3		
	7.TEST. Case histories,	2h, Learning outcomes:	1,2,3		
	8.Geotechnical investig	ation., 2h, Learning out	comes:1,2,3,4,5,10		
	9.Soil strength., 2h, Lea	arning outcomes:5			
	10.Slope stability: infin	ite slope., 2h, Learning o	outcomes:5,6,7		
	12.Slope stability 2h.	l earning outcomes:7.8.	0		
	13.Landslides., 2h, Lea	rning outcomes:7,8,10			
	14.Landslide stabilizati	on methods., 2h, Learnii	ng outcomes:7,8,10		
	15.TEST. Case histories	s, 2h, Learning outcomes	::6,7,8,10		
Course content	1 work in classroom				
Lourse content	2 identification of coars	se soils 1h Learning out	comes 1		
laboratory	3.identification of fine s	soils, 1h, Learning outco	mes:1		
	4.work in classroom				
	5.work in classroom				
	6.work in classroom				
	7.work in classroom				
	9.work in classroom				
	10.work in classroom				
	11.slope stability, 1h, L	earning outcomes:7			
	12.slope stability, 1h, L	earning outcomes:7			
	13.work in classroom				
	15.work in classroom				
Course content	1.				
seminars	2.				
I	I				

1	13
	4.
	5.
	6
	7.
	8.
	10.
	11
	12.
	13.
	14. 15 Seminar presentation., 2h. Learning outcomes:1,2,3,4,5,6,7,8,9,10
Course content	1.Soil density, specific and unit weight, water content., 2h, Learning outcomes:1,2
constructures	2.Pore water pressure, total and effective stresses., 2h, Learning outcomes:3
	3. Classification and identification of coarse soils., 1h, Learning outcomes:1,2
	4. Classification and identification of the solis., 11, Learning outcomes.1,2
	6. Pore water pressure, total and effective stresses: seepage. Effects of soil permeability., 2h, Learning outcomes:3
	7.Settlement and consolidation., 2h, Learning outcomes:4
	8.Direct shear., 2h, Learning outcomes:4
	9.Geotechnical laboratory., 2h, Learning outcomes:1,2,4,5,9
	10 Geostope , 21, Learning outcomes.6,7,8
	12.Geoslope., 1h, Learning outcomes:6,7,8
	13.Geoslope., 2h, Learning outcomes:6,7,8
	14.Slope stability., 2h, Learning outcomes:6,7,8
	15.seminar
Required materials	Basic: classroom blackboard chalk
Required materials	Special purpose laboratory
	General purpose computer laboratory
	Whiteboard with markers
	Overhead projector Portable overhead projector
Exam literature	Basic literature:
	1. Zlatovic, S., 2006, Uvod u mehaniku tla, TVZ, http://nastava.tvz.hr/zlatovic/knjiga/zlatovic 2006 uvod u mehaniku tla
	naslov.htm
	Additional literature:
	1. Nonveiller,E: Mehanika tla. Temeljenje građevina. Školska knjiga, Zagreb. 1979, 1981
	2. Nonveiller,E.: Kliženje i stabilizacije kosina, Školska knjiga, Zagreb, 1987, 204 str
	 Lambe, T.W., Whitman, R.V.: Soil Mechanics, John Wiley Sons, Inc., New York, 1969, 553 str Development of Englishing International Methods and Participation of Control (2002) 752 str
	 BOWIES, J.E.: FOUNDATION Engineering Handbook, Van Nostrand Reinnold Co., New York, 1982, 752 str. Geoslope, student version, http://www.geo-slope.com/downloads/student asp.
	5. Verruijt, A., Soil mechanics, Delft University of Technology, http://geo.verruijt.net/, 2006
	6. Eurocode 7: Geotechnical design
Students obligations	All of the conditions to be fullfilled:
	two assignements solved - at least 9 points (target: 10 points),
	at least 10 points for each of 3 tests (target: 20 points).
	in total at least 60 points of targeted 100 points.
Knowledge	2 assignements: target: 10 points (20 in total)
evaluation during	3 tests: target: 20 points (60 or more in total)
semester	I seminary: target 10 or more (10 or more in total)
	Inini-tests, nomeworks etc. target 2 or 5 points each (10 or more in total).
	Students who obtain 75 or more points are invited to oral exam directly.
Knowledge	Examinations: written part: problems, oral part: recognition of a problem, way to solution
evaluation after	
Student activities:	Aktivnost FCTS
	(Written exam) 1
	(Oral exam) 1
-	(Activity in class) 3
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have completed Gradevinski materijali Students cannot enroll in this course unless they have completed Osnova coologija
	Students cannot enroll in this course unless they have completed Osnove geologije
	Students cannot enroll in this course unless they have passed Tehnička mehanika
	- · ·
ISVU equivalents:	22346;155940;



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Study programme for academic year 2018/2019

Proposal made by dr.sc. Sonja Zlatović

Code WEB/ISVU	23923/184651	ECTS	5.0	Academic year	2018/2019
Name	Steel Structures				
Status	4th semester - Undergi	aduate professional st	udy in civil engineering	(Redovni graditeljstvo) - c	bligatory course
Teaching mode	Lectures + exercises (a	uditory + laboratory +	seminar + metodology	(+ construction)	30+30 (12+0+0+18)
-	work at home				90
Teachers	Lectures:1. dr.sc. Krune	oslav Pavković dipl.ing	.građ.		
	Lectures:2. prof.vis.šk.	Boris Baljkas			
	Auditory exercises:dr.s	c. Krunoslav Pavkovic	dipl.ing.grad.		
	Construction exercises	dr.sc. Krunoslav Pavko	. deuii. Wić dinl ing građ		
	Construction exercises	: Šime Serdarević mag	. ing. aedif.		
Course objectives	Students acquire basic	knowledge on the sha	ping, design, analysis, s	afety and realization of st	eel structures.
Learning outcomes:	1.present structural sys	stems for steel structu	res. Level:6,7	-	
-	2.analyze construction	procedures. Level:6			
	3.estimate actions on s	teel structures. Level:	6,7		
	4.calculate resistance of	of steel elements. Leve	el:6		
	5.draw a disposition co	ncept for steel structu	impler steel structures		
			impler steel structures.	Level.0	
Methods of carrving	Ex cathedra teaching				
out lectures	Case studies				
	Demonstration				
	Simulations				
	Discussion				
	Questions and answers	recented in the stage (of docian fabrication an	d araction by Student area	un sizo moans of
	drawings, photographs	and video presentatio	ns.	a election by Student gro	ap size means of
Methods of carrying	Group problem solving				
out auditory	Traditional literature ar	nalysis			
exercises	Data mining and knowl	edge discovery on the	Web		
	Discussion, brainstorm	ing			
	Computer simulations				
	Presentation of structu	res through drawings,	and explanations relating	ig to preparation of struct	urai design documents.
How construction	Discussion, brainstorm	ing ving			
exercises are neiu	Workshop	Villg			
	Independent elaboratio	on of design documents	s for structures. Design	work and working drawing	JS.
Course content	1, 2h, Learning outco	mes:1	•		<u>.</u>
lectures	2, 2h, Learning outco	mes:1			
	3, 2h, Learning outco	mes:1			
	4, 2h, Learning outco	mes:2			
	5, 2h, Learning outcom	mes:5			
	o, 2n, Learning outcol	mes:5			
	8 2h. Learning outco	mes:3.4			
	9, 2h, Learning outco	mes:4,6			
	10, 2h, Learning outc	omes:6			
	11, 2h, Learning outc	omes:3			
	12, 2h, Learning outco	omes:1			
	13, 2h, Learning outco	omes:6			
	15 2h. Learning outc	omes:6			
Course content	1, 2h, Learning outco	mes:1			
auditory	2, 2h, Learning outco	mes:5			
	3, 2h, Learning outco	mes:5			
	4, 20 5 - 2h				
	6 2h. Learning outco	mes:2.3			
	7, 2h				
	8, 1h, Learning outco	mes:3,4			
	-, 1h, Learning outcom	es:4			
	9, 2h				
	10, 20 11 - 2b				
	12 2h. Learning outco	omes:3.4.6			
	13, 2h				
	14, 2h				
	15, 2h				
	1 0				
course content	1, 211 2 2h				
	3, 2h				
	4, 2h, Learning outco	mes:1			
	5, 2h, Learning outco	mes:1			
	6, 2h				
l	1, 2h, Learning outco	mes:3,4			

I	
	9, 2n, Learning outcomes: 3,4
	10, 2h, Learning outcomes:3,4
	11, 2h, Learning outcomes:3,4
	12, 2h
	13, 2h, Learning outcomes:6
	14, 2h, Learning outcomes:6
	15, 2h, Learning outcomes:6
Required materials	Basic: classroom, blackboard, chalk
	Whiteboard with markers
	Overhead projector
	Video equipment
Exam literature	Basic literature:
	1. B. Androić, D. Džeba, I. Dujmović: METALNE KONSTRUKCIJE I, Udžbenik sveučilišta u Zagrebu, Građevinski fakultet,
	Izdavač: IGH Zagreb 1994.
	Additional literature:
	1 A. Vukov: IIVOD II METALNE KONSTRUKCIJE Izdavač: Fakultet građevinskih znaposti Sveučilišta u Splitu. 1988
	2. TEHNIČKA ENCIKLOPEDIJA: Čelik Čelične konstrukcije aluminijske konstrukcije HLZ. Zagreb
	z. TELINICHA ENCIRED EDIJA. CEIK, CEIKI, KOISTUKEJE, aluminiske konstrukcije, TEZ, Zagrebu 2. B. Androić, D. Doba, I. Duimović, METALNE KONSTDIKCIJE 4. Udžhapik avaužiliža, zagrebu. Crađovinski fakultat
	Izdavač i A PROJENTIKANJE, Zagreb 2005.
	4. Heimut C. Schulitz, werner Sobek, Karl J. Habermann: SLEEL CONSTRUCTION MANUAL, Izdavac: Birkhauser Verlag
	Detail edition, Basel, 1999. (engleski ili njemački jeziki)
	5. L. V. Leech: STRUCTURAL STEELWORK FOR STUDENTS. IZdavac: Butterworth co., London 1988.
Students obligations	maximum of 3 absences from exercises
Knowledge	Programski zadatak#1#0#75\$Usmena proviera znania#1#0#25\$
evaluation during	
semester	
Knowledge	The written part of the examination consists of a typical design problem and five questions
evaluation after	The oral part of the examination may be taken only by students that acquired at least 60 percent of points during the
somester	written examination. During this examination the student is expected to elaborate on solutions used in the written part
Semester	white examination, but instruction and is also expected to subject to the course
Student activities	Altimator, and is also expected to answer questions pertaining to this course.
Student activities:	
	(Project) 1
	(Written exam) 2
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot pass this course unless they have passed Proračun konstrukcija
	Students cannot enroll in this course unless they have completed Građevinski materijali
	Students cannot enroll in this course unless they have passed Matematika I
	Students cannot enroll in this course unless they have passed Nacrtna geometrija u graditeljstvu I
	Students cannot enroll in this course unless they have completed Proračun konstrukcija
ISVU equivalents:	22347;155942;

Study programme for academic year 2018/2019

Code WEB/ISVU	23456/155965	ECTS	3.0	Academic year	2018/2019		
Name	Strength of materials						
Status	2nd semester - Undergraduate professional study in civil engineering (Redovni graditeljstvo) - obligatory course						
Teaching mode	Lectures + exercises (auditory + laboratory + seminar + metodology + construction) 15+30 (28+2+0+0) work at home 45						
Teachers	Lectures:1. dr.sc. Krunoslav Pavković dipl.ing.građ. Lectures:2. doc. dr. sc. Dean Čizmar dipl. ing. građ. Auditory exercises: Šime Serdarević mag. ing. aedif. Laboratory exercises: Šime Serdarević mag. ing. aedif.						
Course objectives	/						
Learning outcomes:	 Determining the basic load cases and internal forces. Level:6 Calculate stresses of structure elements. Level:6 Solve main balance equations. Level:6 Calculate deformations of structural elements Level:6 Apply Hook law. Level:6 Calculate the geometric characteristics of the section. Level:6 Calculate the geometric characteristics of the section. Level:6 Analytical and grafoanalyticall defining defamation of girders . Level:6 Calculate the core of cross-section. Level:6 Dauckling check. Level:6 						
Methods of carrying out lectures	Ex cathedra teaching						
Methods of carrying out auditory exercises	Group problem solving						
Methods of carrying out laboratory exercises	Laboratory exercises on	a laboratory equipment					
Course content lectures	 1.General assumptions. Basic assumptions in strength of materials. External and internal forces. Basic loading of beam, 1h, Learning outcomes:1 2.Stress analysis. Differential equations of balance and transformation equations. , 1h, Learning outcomes:1,2,3 3.Major stresses. Mohrs stress circle. Strain analysis. Major strains. , 2h, Learning outcomes:4 4.Hooke law. Material elasticity constants. Influence of temperature. , 1h, Learning outcomes:5 5.Geometric characteristic of flat beam cross sections, 1h, Learning outcomes:6 6.Moment of inertia. Main axes of inertia. Moment of resistance. Steiners theorem. , 1h, Learning outcomes:6 7.Axial beam loading. Temperature stress. Shear. , 1h, Learning outcomes:1,2,3,4,5,6 8.Torsion of flat and non flat beams., 1h, Learning outcomes:1,2,3,4,5,6,7 10.Bending under forces. Eccentric loading. , 1h, Learning outcomes:1,2,3,4,5,6,7 11.Deflections of beams in bending (analytical and graphical approach), 2h, Learning outcomes:1,3,8 12.Cross section core, 1h, Learning outcomes:6,9 13.Buckling of beams. Euler critical force., 1h, Learning outcomes:10 14./ 15./ 						
Course content auditory	1.General assumptions. equations, 3h, Learning 2.Stress-strain relation. 3.Geometric characteris 4.Axial beam loading - e 5.Erorrs in execution of 6.Shear of flat beam cro 7.Torsion of flat beam cro 8.Bending of flat beams 9.Bending under forces, 10.Analytical method fo 11.Graphical method fo 12.Buckling of beams, 2 13./ 14./ 15./	Stress and strain analys outcomes:1,2,3,4,5 Hooke law. Material elas stics of cross sections, 3 extension and pressure , beams and temperature oss sections, 3h, Learnin cross sections, 2h, Learnin s. Pure bending, 2h, Learning. Pure bending, 2h, Learning outcomes or calculation of beam de r calculation of beam de th, Learning outcomes:1	sis. Stress tensor. Different sticity constant., 3h, Lea n, Learning outcomes:6 2h, Learning outcomes: e streses, 2h, Learning o g outcomes:1,2,3,4,5 ng outcomes:1,2,4,5,6 ning outcomes:1,2,3,4,5 :1,2,3,4,5,6 :flections, 2h, Learning o 0	ential equations of balan irning outcomes:1,2,3,4, :1,2,3,4,5 utcomes:1,2,3,4,5 5,6 outcomes:1,3,8 outcomes:1,3,8	ce and transformation 5		
Course content laboratory	1. Testing of beam and 2./ 3./ 4./ 5./ 6./ 7./ 8./ 9./ 10./ 11./ 12./ 13./ 14./	material diagram. Deter	mination of constants of	f elasticity, 2h, Learning	outcomes:1,2		

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	15./				
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Overhead projector Video equipment				
Exam literature	[1]V. Šimić: Otpornost materijala I, Školska knjiga, Zagreb, 1992. [2]V. Šimić: Otpornost materijala II, Školska knjiga, Zagreb,1995.				
Students obligations	25% on colloquiums during semester				
Knowledge evaluation during semester	First colloquium: practical problem (max 30%) Second colloquium: practical problem (max 30%) Requirements: more than 50% on each colloquium				
Knowledge evaluation after semester	Written and oral exam				
Student activities:	Aktivnost ECTS (Written exam) 1 (Oral exam) 1 (Constantly tested knowledge) 1				
Remark	This course can not be used for final thesis theme				
Prerequisites:	Students cannot enroll in this course unless they have completed Tehnička mehanika Students cannot pass this course unless they have passed Tehnička mehanika				
ISVU equivalents:	147427;				
Proposal made by	Dr. sc. Dean Čizmar dipl. ing. građ., 4.4.2017				

Code WEB/ISVU	23935/184732	ECTS	5.0	Academic year	2018/2019
Name	Transport and Environ	ment			
Status	6th semester - Civil an	d Environmental Engine	ering (Redovni graditeljs	tvo) - obligatory course	
Teaching mode	Lectures + exercises (work at home	auditory + laboratory +	seminar + metodology +	⊢ construction)	30+30 (8+0+0+22) 90
Teachers	Lectures:1. dr.sc. Mlad	en Petričec dipl.ing.građ			-
	Lectures: Ivana Bartoli	ć , pred.			
	Auditory exercises: De	jan Kovačević dipl.ing.gr	ađ.		
	Construction exercises	: Dejan Kovacevic dipl.ir	ig.grad.		
Course objectives	Students will learn to r	ecognise environmental	impacts of road constru- liminating or reducing si	ction and road traffic, and uch unfavourable impact	d to plan and implement
Learning outcomes:	1.identify features of p	articular types of traffic	and their pressure on th	e environment. Level:6	
j	2.estimate pressures a	and impacts of certain ty	pes of traffic on the envi	ronment. Level:6,7	
	3.analyze the processe	es and data of sustainab	e planning and the use of	of roads. Level:6	
	4.establish general me	easures to mitigate the a	dverse impact of transpo	ort on the environment. L	_evel:6,7
	6 establish measures t	o protect the environme	vei:0,7 nt from the waste water	from roads. Level:6	
	7.suggest a way of ma	intaining the drainage s	stem of roads. Level:6.7	7	
			,,-		
Methods of carrying	Ex cathedra teaching				
out lectures	Case studies				
	Homework presentation	n lastrua room, with uso of	Emodorn IT oquinmont	Ac part of auditory oversi	icas field work is
	planned for gaining ing	sight into characteristic e	a modern in equipment. A	s part of additory exerci-	d the environment
Methods of carrying	Group problem solving				
out auditory	Other				
exercises	Solving tasks on the b	ackboard, with active st	udent participation.		
How construction	Group problem solving	l.			
exercises are held	Discussion, brainstorm	ning			
	Workshop Othor				
	The work in groups to	solve the programming t	as		
Course content	1.The state traffic and	development trends , 1h	n, Learning outcomes:1		
lectures	Main components of th	ne environment, 1h, Lear	ning outcomes:1		
	2.Types of traffic and e	environmental impacts, 2	2h, Learning outcomes:2		
	3. The pressures and in 4. Planning and use of	npacts of transport on th	e environment, 2h, Lear	ning outcomes:2	.2
	5 Planning and use of	roads according to the p	rinciples of sustainability	1 1 Learning outcomes	
	Measures to mitigate t	he adverse impact of tra	insport on the environme	ent, 1h, Learning outcom	es:4
	6.Measures to mitigate	e the adverse impact of t	ransport on the environr	nent, 2h, Learning outco	mes:4
	7.Drainage and eleme	nts of road runoff, 2h, Le	arning outcomes:5		
	8.1. preliminary exam.,	2h, Learning outcomes:	1,2,3,4		
	10.Facilities for treatm	ent of rainwater from ro	ads. 2h. Learning outcon	nes:6	
	11.Facilities for treatm	ent of rainwater from ro	ads, 2h, Learning outcon	nes:6	
	12.Facilities for treatm	ent of rainwater from ro	ads, 2h, Learning outcon	nes:6	
	13.Maintenance and re	econstruction of drainage	e systems during use, 2h	, Learning outcomes:7	
	14. Maintenance and r	2 2h Learning outcome	e systems during use, Zi	i, Learning outcomes:/	
		i, zii, Leanning bateonie.	5.5,0,7		
Course content	1.An example of the d	etermination of the relev	ant heavy rain for runof	f from roads, 2h, Learnin	g outcomes:4
auditory	2.Examples of calculat	ion of the relevant hydro	graph of runoff from roa	ds., 2h, Learning outcom	ies:4
	3.Design of oil and gre	ase separator, 2h, Learn	ing outcomes:6		
	5.Designing lagoon wit	th extended retention. 2	h. Learning outcomes:6		
	6.Designing lagoon wit	th extended retention, 2	h, Learning outcomes:6		
	7.No lectures.				
	8.No lectures.				
	10 No lectures.				
	11.No lectures.				
	12.No lectures.				
	13.No lectures.				
	14.No lectures.				
	IJ.NO IECLUIES.				
Course content	1.No lectures				
constructures	2.No lectures				
	3.No lectures				
	4.No lectures				
	5.NO RECTURES				
	7.Interpretation and w	ork on a seminar paper	2h, Learning outcomes:	6	
	8.No lectures	in the second			
	9.Interpretation and w	ork on a seminar paper.,	2h, Learning outcomes:	6	
	10.Interpretation and	work on a seminar paper	., 2h, Learning outcomes	3:6	
I	LTT. Interpretation and v	work on a seminar paper	., 2n, Learning outcomes	50	

	12.Interpretation and work on a seminar paper., 2h, Learning outcomes:6
	13.No lectures
Required materials	Basic: classroom, blackboard, chalk
	Whiteboard with markers
	Overhead projector
	video equipment
Exam literature	Nastavni materijali: Mladen Petričec - Promet i okoliš I. dio
	Nastavni materijali: Davor Malus - Zaštita okoliša od negativnog djelovanja prometnica
	Zbornici s 1., 2., i 3. Kongresa o cestama
Students obligations	Attendance of lectures and exercises. It is necessary to achieve 30 or more points score through activities during the semester (preliminary exams, seminars,).
Knowledge	Through activities during the semester a student can achieve 30-60 points score. Student who achieve more than 15
evaluation during	and less than 30 points score is allowed to write additional test. If student achieve minimum of 30 points score or more,
semester	student is allowed to take final exam.
	Student who achieve less than 15 mark points during semester in the next year must enrol the subject again.
Knowledge	Final exam, by which student can achieve 40 points score, is obligatory for all subjects. For a positive final exam
evaluation after	evaluation it is required 20 points score (50%). The final subject mark contains points achieved during the semester
semester	and on final exam as a percentage of acquired knowledge and skills as follows:
	90 - 100 - A
	80 - 89.9 - B
	50 - 59 9 - F
Student activities:	Aktivnost ECTS
	(Classes attendance) 5
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have passed Zaštita okoliša
	Students cannot enroll in this course unless they have passed Proračun konstrukcija
	Students cannot enroll in this course unless they have passed Matematika II
	Istudents cannot enroll in this course unless they have passed Ceste I
ISVU equivalents:	147448;155967;
Proposal made by	dr.sc. Mladen Petričec prof. v. šk.

Code WEB/ISVU	23438/155935	ECTS	4.0	Academic year	2018/2019		
Name	Waste Management						
Status	5th semester - Civil and Environmental Engineering (Redovni graditeljstvo) - obligatory course						
Teaching mode	Lectures + exercises (auditory + laboratory + seminar + metodology + construction) 30+30 (12+0+18+0) work at home 60						
Teachers	Lectures:1. Tomislav Domanovac Lectures:mr.sc. Gorana Ćosić-Flajsig viši predavač Auditory exercises: Tomislav Domanovac Seminar exercises: Tomislav Domanovac						
Course objectives	Students will be able to	recognise and independ	lently solve waste mana	gement problems.			
Learning outcomes:	1.make distinction between the terms waste and garbage. Level:6 2.categorize and classify types of waste. Level:6 3.design an integrated sustainable waste management system. Level:6 4.identify places and causes of generation of construction waste. Level:6 5.anticipate sustainable construction waste management projects. Level:6,7 6.comment on advantages and shortcomings of waste disposal. Level:6 7.present to experts and general public the significance and scope of waste management. Level:6,7 8.anticipate and design a construction waste sorting facility. Level:6,7						
Methods of carrying out lectures	Ex catnedra teaching Other Interactive understanding of waste, particularly waste in modern society. Differentiating between waste types and states, i.e. structure. Connecting construction activities and waste production. Studying the connection of production/construction technologies and waste reduction and recycling. Acquired knowledge will be tested at construction sites and waste disposals. Learning about methods of waste analysis and evaluation						
Methods of carrying out auditory exercises	Group problem solving Other Solving concrete tasks	with active student part	icination				
Methods of carrying out seminars	Other Work in groups on solvi students.	ing defined problems, ba	sed on solved tasks. Insi	sting on own solution pr	oposals to problems by		
Course content lectures	1.Poimanje materijalno 2.Otpad nije sme vrste 3.Katalog otpada, pose 4.Otklanjanje-zbrinjava 5.Izbjegavanje - smanji 6.I. kolokvij, 1h, Learnir Cjeloviti sustav odrivog 7.Odvojeno skupljanje o 8.Reciklaa granskog otj 9.Oporaba i obrada gra 10.Odlaganje otpada, v 11.EU propis i odlaganj 12.Opasan i problemati 13.II. kolokvij, 1h, Learr Gospodarenje graim ot 14.Mobilna postrojenja	g i nematerjalnog otpada otpada., 2h, Learning ou bne vrste otpada., 2h, Le nje-gospodarenje., 2h, Le vanje otpada., 2h, Learnin g outcomes:1,2,4,6 j gospodarenja otpadom. otpada, 2h, Learning outco pada., 2h, Learning outco inskog otpada., 2h, Learn rrste odlagalita., 2h, Learn rrste odlagalita., 2h, Learn i otpad., 2h, Learning out o topad., 2h, Learning out za RGO., 2h, Learning ou bada - projekt., 2h, Learni	a., 2h, Learning outcome tcomes:1,2 earning outcomes:1,2,7 earning outcomes:1,2,3, ing outcomes:1,2,4,6 , 1h, Learning outcomes comes:2,3 omes:3,5 ning outcomes:3,5 ning outcomes:3,6 outcomes:6,7 tcomes:2,3,7 tcomes:5,7 utcomes:4,5,7 ng outcomes:8	s:1 5 :3,5,6,7			
Course content auditory	 1.EU i hrvatski aktualni 2.EU i hrvatski aktualni 3.Vrste graog otpada., 4.Vrste graog otpada., 5.Terenske vjebe., 2h, I 6.Terenske vjebe., 2h, I 7.Terenske vjebe., 2h, I 8.Nema vjebi. 9.Nema vjebi. 10.Nema vjebi. 11.Nema vjebi. 13.Nema vjebi. 14.Nema vjebi. 15.Nema vjebi. 	propisi za grai otpad., 2ł propisi za grai otpad., 2ł 2h, Learning outcomes:2 2h, Learning outcomes:6 Learning outcomes:6 Learning outcomes:6	h, Learning outcomes:2 h, Learning outcomes:2				
Course content seminars	1.Nema vjebi. 2.Nema vjebi. 3.Nema vjebi. 4.Nema vjebi. 5.Nema vjebi. 6.Nema vjebi. 8.Obrazloenje i na prov 9.Mjesta nastanka grao 10.Mjesta nastanka gra 11.Mjesta nastanka gra 12.Konstrukcija i projak	redbe seminarskih vjebi., og otpada - izrada semina og otpada - izrada semir og otpada - izrada semir og otpada - izrada semir <t 2h,="" l<="" postrojenja="" rgo.,="" th=""><th>2h arskog., 2h, Learning out arskog., 2h, Learning ou arskog., 2h, Learning ou earning outcomes:5,8</th><th>comes:4 utcomes:4 utcomes:4</th><th></th></t>	2h arskog., 2h, Learning out arskog., 2h, Learning ou arskog., 2h, Learning ou earning outcomes:5,8	comes:4 utcomes:4 utcomes:4			

	13.Konstrukcija i projakt postrojenja RGO., 2h, Learning outcomes:5,8
	14.Konstrukcija i projakt postrojenja RGO., 2h, Learning outcomes:5,8
	15.Prezentacija i obrana seminarskih radova., 2h, Learning outcomes:4,5,8
Required materials	Basic: classroom, blackboard, chalk
	Whiteboard with markers
	Overhead projector
	Video equipment
Exam literature	Osnovna:
	1. Zlatko Milanović i dr.: Otpad nije smeće, Gospodarstvo i okoliš / Mtg-topgraf, Zagreb 2002.
	2. Zlatko Milanović: Deponij, trajno odlaganje otpada, ZGO Zagreb 1992.
	3. Vladimir Potočnik V.: Obrada komunalnog otpada svjetska iskustva MTG Consulting, Velika Gorica 1997.
	4. Grupa autora: BIOEN, Energetski institut Hrvoje Pozar, Zagreb 1998.
	uooatna: 1. Dae Umweltleviken, lastitut fuer angewandte Umweltferschung, Kinnenheuer (Witsch, 1992 Keeln 1. 900 Terms in
	L. Das Oniweitiezikoni, institut tuer angewandte Oniweitioischung, Nippenneder / witsch, 1995 Koem 1,000 remis in
	Joint Waste Mainagenient, i Swa Kopeninagen 1992.
Students obligations	2. oropa dational consistence of the pastave
Students obligations	Uspieno poloen Kolokvii s numerim i teoretskim odrednicama.
Knowledge	Aktivan i konstruktivan rad na viebama.
evaluation during	Uspjeno izra i objanjenji seminarski radovi i poloen Kolokvij.
semester	Prema sakupljenom broju bodova dobivaju se sljedeocjene:
	61-80 bodova - dovoljan (2)
	81-100 bodova - dobar (3)
	101-110 bodova - vrlo dobar (4)
	vie od 111 bodova - izvrstan (5).
Knowledge	lspit se polae u dva dijela: pismeni i usmeni dio.
evaluation after	
semester	
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have passed Zaštita okoliša
	Students cannot enroll in this course unless they have passed Osnove hidrologije i hidraulike
	Students cannot enroll in this course unless they have passed Matematika II
	Students cannot enroll in this course unless they have passed Proracun konstrukcija
	Students cannot enroll in this course unless they have completed Hidrologija i hidraulika
ISVU equivalents:	22376;147435;
Proposal made by	v.predavač Zlatko Milanović, 31.3.2014.

Code WEB/ISVU	23933/184729	ECTS	5.0	Academic year	2018/2019		
Name	Water protection	•		•			
Status	5th semester - Civil an	d Environmental Eng	gineering (Redovni	graditeljstvo) - obligatory course	2		
Teaching mode	Lectures + exercises (work at home	auditory + laboratory	y + seminar + met	odology + construction)	30+30 (5+2+5+18) 90		
Teachers	Lectures:1. mr.sc. Gorana Ćosić-Flajsig viši predavač Auditory exercises: Marin Ganjto Auditory exercises: Dejan Kovačević dipl.ing.građ. Laboratory exercises: Dejan Kovačević dipl.ing.građ. Seminar exercises: Dejan Kovačević dipl.ing.građ.						
Course objectives	Students will be able to	o recognise water pr	otection problems,	and will learn to implement civi	l engineering measures		
Learning outcomes:	1.analyse water protection as the part of integrated water management. Level:6 2.analyse of the point and difuse pollution sources . Level:6 3.calculate pollution load for an urban community. Level:6 4.assesment of the water body state. Level:6,7 5.analyse water state of the catchment area and propose necessary water protection measures. Level:6 6.calculate of the small settlement sewage system. Level:6 7.propose a waste water treatment concept using the 1st, 2nd, and 3rd level of purification. Level:6,7 8.propose a sludge treatment and disposal concept. Level:6,7						
Methods of carrying out lectures	Ex cathedra teaching Guest lecturer Case studies Demonstration Discussion Questions and answers Seminar, students pres Lectures are performe achieved by means of	s sentation and discus: d in a lecture room, i questions and discus	sion with the use of moc ssions during lectur	lern equipment. More active stu es. A visit to a laboratory and cl	Ident participation is haracteristic locations.		
Methods of carrying out auditory exercises	Group problem solving Traditional literature a Discussion, brainstorm Mind mapping Interactive problem so Solving practical tasks	nalysis ing lving on the blackboard, v	with active student	participation.			
Methods of carrying out laboratory exercises	Laboratory exercises o Traditional literature a Data mining and know Discussion, brainstorm	n laboratory equipm nalysis ledge discovery on t ing	ent he Web				
Methods of carrying out seminars	Laboratory exercises o Group problem solving Traditional literature a Data mining and know Discussion, brainstorm Mind mapping Workshop	n laboratory equipm nalysis ledge discovery on t ing	ent he Web				
How construction exercises are held	Group problem solving Traditional literature a Data mining and know Interactive problem so Workshop Other Preparation of a progra	nalysis ledge discovery on t lving am in groups, under	he Web lecturer				
Course content lectures	1.Plan of the course co The issue of water proi 2.Legislative and other Sources and types of p 3.Basic ecological char The impact of pollution 4.Basic procedures and outcomes:5,8 5.Sewage system, 3h, 6.Hydraulic design of s 7.Sizeing sewage syste Basic principles of was 8.No lessons 10.Municipal wastewat 11.Municipal wastewat 12.No lessons 13.No lessons 13.No lessons 14.Second Colloquium	Intent and exams, 2f tection within the int tection within the int reasures to protec sollution, 2h, Learnin racteristics of water a n on water status, 1h d measures used in t Learning outcomes: sewage system, 2h, L em, 1h, Learning out tewater treatment, 1 ter treatment , 4h, Le re treatment , 4h, Le	n legrated water man tegrated water man t water , 1h, Learni g outcomes:2 and description of w , Learning outcomes: comes:6 Lh, Learning outcomes:7 earning outcomes:7 mes:6,7,8	agement, 1h, Learning outcome hagement, 1h, Learning outcome ng outcomes:1 vater status, 2h, Learning outco es:4 nt and diffuse sorces of pollution 5 nes:7 ',8 ,8	es:1 mes:4 n , 4h, Learning		



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	15.No lessons
Course content auditory	 1.No lessons 2.Calculation of pollution load and Assessment of water status, 1h, Learning outcomes:3 3.No lessons 4.No lessons 5.Sewer system , 1h, Learning outcomes:5 6.Hydraulic design of sewage system, 1h, Learning outcomes:6 7.Sizeing sewage system, 1h, Learning outcomes:6 8.No lessons 9.No lessons 10.No lessons 11.No lessons 12.Municipal wastewater treatment, 1h, Learning outcomes:6,7 13.No lessons 14.No lessons 15.No lessons
Course content laboratory	1.No lessons 2.No lessons 3.No lessons 4.No lessons 5.No lessons 6.No lessons 7.No lessons 8.No lessons 9.No lessons 10.No lessons 11.No lessons 12.Visiting wastewater treatment plant, 2h, Learning outcomes:1,2,3,4,5,6,7,8 13.No lessons 14.No lessons 15.No lessons 15.No lessons
Course content seminars	1.No lessons 2.No lessons 3.No lessons 4.No lessons 5.No lessons 6.No lessons 7.No lessons 8.No lessons 9.No lessons 10.No lessons 11.No lessons 12.No lessons 13.Municipal wastewater treatment, 3h, Learning outcomes:7,8 14.Municipal wastewater treatment, 2h, Learning outcomes:7,8 15.No lessons
Course content constructures	 1.No lessons 2.No lessons 3.No lessons 4.Calculation of pollution load, 2h, Learning outcomes:3 5.The first project -submission and interpretation, 1h, Learning outcomes:1,2,3,4 6.Hydraulic design of sewage system, 1h, Learning outcomes:6 The first Colloquium, 1h, Learning outcomes:1,3,4,5 7.Sizeing sewage system, 2h, Learning outcomes:5 8.Sizeing sewage system, 2h, Learning outcomes:5 10.Sizeing sewage system, 2h, Learning outcomes:5 11.Sizeing sewage system, 2h, Learning outcomes:5 12.The second project - submission and interpretation, 2h, Learning outcomes:5,6 13.No lessons 14.No lessons 15.The third project -submission and interpretation, 2h, Learning outcomes:7,8
Required materials	Special purpose laboratory Special purpose computer laboratory Whiteboard with markers Overhead projector Video equipment Preparation of a program individually or in groups, under lecturer supervision
Exam literature	Basic literature: 1. Čosić-Flajsig G.: Skripta kolegija Zaštita voda, TVZ, Graditeljski odjel 2. Tedeschi S.: Zaštita vodnih sustava i pročišćavanje otpadnih voda, HDGI, Zagreb, 1997. 3. Margeta J., Oborinske i otpadne vode: teret onečišćenja, mjere zaštite, Građevinsko-arhitektonski fakultet Sveučilišta u Splitu, Split, 2007.

	4. Tušar B., Pročišćavanje otpadnih voda, KIGEN, GFV, Zagreb, 2009. Godine 5. Margeta I.: Osnove gosnodaranja vodama, Građavinski fakultet Split, 1992				
	Additional literature:				
	 Margeta J.: Guidelines on Sewage Treatment and Disposal for the Mediterranean Region, WHO-GEF, Athens, 2004. Metcalf Eddy; Wastewater Engineering, Treatment Disposal, Reuse, McGraw-Hill International Editions, 2007. 				
Students obligations	During the semester, 2 colloquium are planned and at least every 7 points need to be collected at each colloquium. During the semester, the preparation of 3 project, 6 points must be collected on each project.				
Knowledge evaluation during semester	During the semester, 2 colloquies are planned (a combination of theoretical and practical questions presented in lectures and exercises) through which students are receiving points. Total can be collected $1 \times 18 + 1 \times 18 = 36$ points. (minimum 9 points per colloquium for passed colloquium). Students can write only one correctional colloquium (I or II colloquium) in the oral part of the exam.				
	Every student during the semester should, with the help of the teacher, create, submit and defend the given term of III (three) programs:				
	l program: quantification of pollution sources, Reduction of pollution sources through wastewater treatment plants maximum 4 points / minimum 1 point for signature				
	ll program: Waste water drainage maximum 12 points / minimum 3 points for signature				
	III program: Purification of municipal wastewater maximum 8 points / minimum 2 points for signature				
	Total: maximum 24 points / minimum 6 points for signature				
	The student can not get the assignment for the next program if he did not submit the previous program in time.				
Knowledge evaluation after semester	At the end of the semester it is mandatory to check the student,s knowledge of the exam, which makes 40 points of assessment. The exam is usually composed of a written and oral part of the exam. An essential requirement for exam is the achievement of 50 % and more success on the written part. The find grade of the subject is the sum of marks obtained during the semester and the exam as a percentage of accepted knowledge and skills, namely: 90-100 - excellent (5) 80-89,9 - very good (4) 65 - 79,9 - good (3) 50 - 64,9 sufficient (2)				
Student activities:	Aktivnost ECTS (Written exam) 1 (Oral exam) 1 (Constantly tested knowledge) 2 (Vrastic used) 1				
Bemark					
Prereguisites:	Students cannot enroll in this course unless they have passed Zaštita okoliša				
	Students cannot enroll in this course unless they have passed Osnove hidrologije i hidraulike				
	Students cannot enroll in this course unless they have passed Matematika II Students cannot enroll in this course unless they have passed Proračun konstrukcija				
	Students cannot enroll in this course unless they have completed Hidrologija i hidraulika				
ISVU equivalents:	22379;155977;				
Proposal made by	Gorana Ćosić-Flajsig, M.sc., Senior Lecturer, 29.06.2018.				
Code WEB/ISVU	23355/147436	ECTS	4.0	Academic year	2018/2019
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Name	Water Quality				
Status	5th semester - Civil and	d Environmental Enginee	ring (Redovni graditeljst	vo) - obligatory course	
Teaching mode	Lectures + exercises (a work at home	Lectures + exercises (auditory + laboratory + seminar + metodology + construction) 30+15 (0+15+0+0) work at home 75			
Teachers	Lectures:1. dr.sc. Ivan Lectures:mr.sc. Gorana Laboratory exercises:d	Vučković dipl.ing.biologij a Ćosić-Flajsig viši predav r.sc. Ivan Vučković dipl.ir	e vač ng.biologije		
Course objectives	Students will be taught	to recognise the signific	ance and role of chemica	al and microbiological pa	arameters in the
Learning outcomes	1 asses the surface wa	ter status based on the r	regulatory regulation of n	nonitoring Level 6.7	
	2.adopt basic concepts 3.anticipate effects of h 4.asess the health of di 5.applay water protecti	from ecology of land wa numan activities on the c rinking water, agriculture ion measures to maintair	condition of water and wa e, swimming (fish), swimin n good surface water sta	ater ecosystems. Level:6 ming (swimming pool ar tus. Level:6,7	3,7 1d beach. Level:6,7
Methods of carrying out lectures	Ex cathedra teaching Case studies Questions and answers Lectures are given with explanations will be pa	; n the aid of modern educ rtly organized at the Mai	ational tools and graphic n Water Management La	: presentations. Themati boratory of Croatian Wa	c units. Lectures and ater.
Methods of carrying out laboratory exercises	Group problem solving Workshop At the laboratory, the s	students will gain insight	into the entire process o	f water quality testing.	with focus on chemical
	and microbiological par	rameters.	·····	······	
Course content lectures	1. The plan of course co 2. Concept, content and Connection of the hydr 3. Circulation of matter Biogeochemical proces 4. Condition of water an The terms that describe 5. Evaluation of water si 6. Impact of pollution or Hydromorfology, 1h, Le 7. Methods and indicies River basin manageme 8. Assessment of water 9. Monitoring of surface 10. assessment of surfa 11. Sustainable water u 12. Natural processes o 13. Applying Water Qua 14. Second Colloquium, Seminar paper - submi 15. Repeated colloquiur Oral part of the exam,	ontent and exam, 2h importance the ecology ology and ecology, 1h, Lea and energy flow, 1h, Lea ses and organic productind in mortance of water ci- e of the water status, 1h, tatus by biological and ci- n water status, 1h, Learn earning outcomes: 3 descibing the ecological int and definition of water status, 2h, Learning outcome status, 2h, Learning outcome f waster status, 2h, Learning ise, 2h, Learning outcome f waste water treatment lity Course in practicits, 1h, Learning outcomes: 1 m, 1h, Learning outcomes in, 1h, Learning outcomes function of the status of the status of the status ission and explanation, 11 m, 1h, Learning outcomes in the status outcomes in the status of the status of the status outcomes ission and explanation, 11 m, 1h, Learning outcomes in the status of the status outcomes in the status outco	of surface water , 1h, Le earning outcomes:1,2 ion, 1h, Learning outcomes: , Learning outcomes:1,2 ion, 1h, Learning outcomes: , Learning outcomes:1,2 hemical parametars, 2h, ing outcomes:3 stzatus of water, 1h, Learning out comes:4,5 earning outcomes:4,5 rning outcomes:4,5 es:4,5 , 2h, Learning outcomes:4,5 ch, Learning outcomes:4,5 h, Learning outcomes:4,5 h, Learning outcomes:4,5 h, Learning outcomes:1,2 s:1,2,3,4,5 ,2,3,4,5	arning outcomes:1,2 es:1,2 g outcomes:1,2 Learning outcomes:2 arning outcomes:4 tcomes:4,5 ::4 I,5 2,3,5	
Course content laboratory	1.Analyses of chemical Analyses of phiysico-ch 2.Analyses of microbiol 3.Analyses of biological 4.Analytical mthods for 5.The first colloquim, 1 6.Hydromorphology, 2h 7.Field trip, 2h, Learnin 8.Field trip, 2h, Learnin 9.Field trip, 2h, Learnin 10.No lecture. 11.No lecture. 12.No lecture. 13.No lecture. 14.No lecture. 15.No lecture.	indicators in the water, nemical indicators in the logical indicators in the water, drinking water samples h, Learning outcomes:1, n, Learning outcomes:1, g outcomes:1,2,3,4 g outcomes:1,2,3,4,5 g outcomes:1,2,3,4,5	1h, Learning outcomes:1 water, 1h, Learning outco vater, 1h, Learning outco 2h, Learning outcomes:3 (sampling, analysis and 2,3	,2 omes:1 mes:2 3 opinion), 1h, Learning o	utcomes:2,3
Required materials	Basic: classroom, black Whiteboard with marke Overhead projector Video equipment	xboard, chalk ers			
Exam literature	Osnovna: 1. Separati koje pripren 2. Valić i sur. Zdravstve Dodatna: 1. S. Tedesci: Zaštita v 2. Dennis R. Hill: Basic	na predmetni nastavnik, ena ekologija, Medicinska odnih sustava i pročišćav Microbiology for Drinking	a naklada, Zagreb 2001. vanje otpadnih voda, Gra g water Personnel	iđevinski institut, Zagret) 1996.

C 1 1 1 1 1 1 1 1 1 1				
Students obligations	s Seminar work was done, regular attendance.			
	Successfully laid I. and II. knowledge testing (Columns I and II)			
	Attendance to field teaching			
	Attend a tour of the la			
Knowledge	Theoretical part of all learning outcomes, max. 70 points.			
evaluation during	Proportionality more than 36 points (50%)			
semester	There is a repair colloquium			
	Oral exam part max. 30 exams.			
	Total max.100 points			
	91-100 = 5			
	81-90 = 4			
	3 = 71-80			
	2 = 61-70			
	60 and less = 1			
Knowledge	The written part of the exam is mx.70 points.			
evaluation after	The oral exam is max.30 points.			
semester	Passage: More than 42 points (60%)			
	Total, max.100 points.			
	91-100 = 5			
	81-90 = 4			
	3 = 71-80			
	2 = 61-70			
	60 and less = 1			
Student activities:	Aktivnost FCTS			
	(Constantly tested knowledge) 2			
	(Experimental work)			
	(Practical work)			
Remark	This course can be used for final thesis theme			
Prerequisites:	Students cannot enroll in this course unless they have passed Matematika II			
r rerequisites:	Students cannot enroll in this course unless they have completed Hidrologia i bidraulika			
	Students cannot enroll in this course unless they have completed Hidrologija i hidraulika			
	Students cannot enroll in this course unless they have passed Profactun konstrukcija			
	Students cannot enroll in this course unless they have passed Zastita okolisa			
ISVU equivalents:	22380;			
Proposal made by	lecture, Ivan Vučković, 20.4.2018.			

Code WEB/ISVU	23450/155955	ECTS	4.0	Academic year	2018/2019
Name	Water Supply and S	ewerage I		•	
Status	5th semester - Civil	Engineering (Wate	er and traffic infrastructur	re) (Redovni graditeljstvo) - ob	ligatory course
Teaching mode	Lectures + exercises work at home	s (auditory + labor	ratory + seminar + meto	dology + construction)	30+30 (10+0+0+20) 60
Teachers	Lectures:1. Stjepan	Kordek dipl.ing.gra	ađ.		
	Lectures:mr.sc. Gora	ana Ćosić-Flajsig v	iši predavač		
	Auditory exercises:	Dejan Kovacevic d	lipl.ing.grad. vić dipl.ing.građ		
Course objectives	Students will be able	e to understand ar	nd solve problems relating	a to hydraulic structures that a	are used for water supply
	drainage, and purific	cation of waste wa	iter.		
Learning outcomes:	1.specify basic prob	lems related to the	e supply of water to consi	umers. Level:6	
	3. propose practical	expertise for the c	onstruction and mainten	ance of water supply systems.	Level:6.7
	4.analyze pipes for	pipelines, and pipe	e fittings types, difference	es, and problems in practical u	se. Level:6
	5.draw 1:25 scale va	alve chamber asse	mbly plan. Level:6		
	6.calculate quantity	of water needed f	for the supply of water to	town districts and towns. Leve	31:6
	7.specify all supply-	system elements t	inat need to be planned a	ind realized to ensure proper v	vater suppry. Level.0,7
Methods of carrying	Other				
out lectures	Oral presentations,	with use of moder	n educational tools. Grap	hic presentations and photogr	aphs of structures, from
	design phase to con	struction and expl	oitation.		
Methods of carrying	Other				
out auditory	Presentation of calc	ulations and drawi	ngs of structures and des	sign elements for structures.	
exercises	Other				
How construction	Uther Independent project	development: wa	ter supply system of a se	ttlement with facilities, sewe	rage system of a
exercises are neu	settlement, with fac	ilities.	ter supply system of a se	cuement, with racinties, sewer	age system of a
Course content	1.Water supply: Intr	oduction, significa	nce of water and water s	upply, characteristics of water	, investigation works, 2h,
lectures	Learning outcomes:	1			
	2.Users and quantiti	es used, water sur	pply systems , 2h, Learni	ng outcomes:2,3	
	3. Users and quantiti	es used, water sup	ppiy systems , 2n, Learnii Iculations and design 2h	ng outcomes:2,3	
	5.Water sources, int	ake structures, ca	Iculations and design , 2h	, Learning outcomes:2,3	
	6.Water sources, int	ake structures, ca	Iculations and design , 2h	n, Learning outcomes:2,3	
	7.Pipelines, water su	upply networks, pip	pe types, sizing and proje	ects , 2h, Learning outcomes:2	,3
	8.1. preliminary exar	n., 2h, Learning ou	utcomes:1,2,3	sta 2h Loorning outcomosid	F
	10.Pipelines, water st	supply networks, pi	pipe types, sizing and proje	iects , 2h, Learning outcomes:4	4.5
	11.Facilities on a wa	ater supply system	(water storage tanks, pu	mping stations), sizing of facil	ities and pumps, 2h,
	Learning outcomes:	5,6			
	12.Facilities on a wa	iter supply system	(water storage tanks, pu	imping stations), sizing of facil	ities and pumps, 2h,
	13.Facilities on a wa	o,o ater supply system	(water storage tanks, pu	mping stations), sizing of facil	ities and pumps. 2h.
	Learning outcomes:	6,7	(nate: storage tains, pa		1105 dila paripo, 211,
	14.Facilities on pipe	line route , 2h, Lea	arning outcomes:7		
	15.II. preliminary ex	am, 2h, Learning o	outcomes:4,5,6,7		
Course content	1 Calculations of wa	tor consumption i	intako structuros. 2h		
auditory	2.Design of water st	corage tanks and p	umping stations, 2h		
	3.Design of water st	orage tanks and p	umping stations , 2h		
	4.Installation plans a	and pipe dimensio	ns , 2h		
	5.Installation plans a	and pipe dimension	ns , 2n		
	7.No lectures . 2h				
	8.No lectures , 2h				
	9.No lectures, 2h				
	10.No lectures, 2h				
	12.Calculations of w	vastewater quantiti	ies, longitudinal grades, s	izing of facilities along the ne	work . 2h
	13.No lectures , 2h		,g		,
	14.No lectures, 2h				
	15.No lectures, 2h				
Course content	1 No lectures 2h				
constructures	2.No lectures, 2h				
	3.No lectures, 2h				
	4.No lectures, 2h				
	5.No lectures, 2h		ustor cupply system of a	anthemant with facilities, say	iorogo quetom of a
	settlement with fac	ilities 2h	valer supply system of a	settlement, with facilities, sew	erage system of a
	7.Independent proje	ct development: v	vater supply system of a	settlement, with facilities; sew	erage system of a
	settlement, with fac	ilities., 2h			
	8.Independent proje	ct development: w	vater supply system of a	settlement, with facilities; sew	erage system of a
	9. Independent proje	illues., Zn Act develonment: v	vater supply system of a	settlement, with facilities, sew	erage system of a
	settlement, with fac	ilities., 2h	fater supply system of a	Sectionient, Men raemeres, sen	eruge system or u
•	•				

	10.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities., 2h 11.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities, 2h 12.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities., 2h 13.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities., 2h 14.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities., 2h 14.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities., 2h 14.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities., 2h 14.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities., 2h 14.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities., 2h 15.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities., 2h 15.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities., 2h 15.Independent project development: water supply system of a settlement, with facilities; sewerage system of a settlement, with facilities., 2h
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Overhead projector Video equipment Oral presentations, with use of modern educational tools. Graphic presentations and photographs of structures, from design phase to construction and exploitation
Exam literature	 Basic literature: 1. Separati predmetnog nastavnika. 2. Mutschmann i Stimmelmayr: Priručnik opskrbe vodom, Građevinska knjiga, 1988. Beograd 3. Gulić: Opskrba vodom, DGHi Zagreb Dodatna: 1. Abramov: Snabdjevanje vodom, Građevinska knjiga, Beograd; 2. Schulze: Wasserversorgung; 3. Purschel: Komunale Wasserversorgung; 4. Fair Geyer: Elements of water supply and Waste Water Disposal John Wiley; 5. Steel, McGhee: Water supply and Sewerage Inernational student Edition McGraw-Hill;
Students obligations	Redovito pohae nastave i najmanje 25% bodova iz kolokvija.
Knowledge evaluation during semester	Redovito pohae nastave i najmanje 60% bodova iz kolokvija.Pozitivno rijeen programski zadatak.
Knowledge evaluation after semester	lspit se sastoji iz pismenog i usmenog dijela. Uvjet za usmeni dio je ostvarenje minimalno 60% uspjeha na pismenom dijelu.
Student activities:	AktivnostECTS(Written exam)2(Oral exam)2
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot enroll in this course unless they have completed Vodogradnje Students cannot enroll in this course unless they have passed Osnove hidrologije i hidraulike Students cannot enroll in this course unless they have passed Proračun konstrukcija Students cannot enroll in this course unless they have passed Matematika II Students cannot enroll in this course unless they have completed Hidrologija i hidraulika Students cannot pass this course unless they have passed Vodogradnje Students cannot pass this course unless they have passed Hidrologija i hidraulika
ISVU equivalents:	22374;
Proposal made by	predavač Stjepan Kordek, dipl.inž.građ., 14.04.2014.

Study programme	for academic	year 2018/2019
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Code WEB/ISVU	23451/155957	ECTS	5.0	Academic year	2018/2019
Name	Water Supply and Sewe	erage II			
Status	6th semester - Civil Eng	gineering (Water and tra	ffic infrastructure) (Redo	vni graditeljstvo) - oblig	atory course
Teaching mode	Lectures + exercises (auditory + laboratory + seminar + metodology + construction) 30+30 (10+0+0+20) work at home 90				
Teachers	Lectures:1. mr.sc. Gora Auditory exercises:mr.s Auditory exercises: Mar Auditory exercises: Dej Construction exercises:	Lectures:1. mr.sc. Gorana Cosić-Flajsig viši predavač Auditory exercises:mr.sc. Gorana Ćosić-Flajsig viši predavač Auditory exercises: Marin Ganjto Auditory exercises: Dejan Kovačević dipl.ing.građ. Construction exercises: Dejan Kovačević dipl.ing.građ.			
Course objectives	To enable a student to	understand and solve pr	oblems related to sewag	je and wastewater treat	ment
Learning outcomes:	1.calculate the relevan 2.to make a situational 3.calculate and dimens 4.calculate combain se 5.assess the required lo	t quantities of wastewate plan for a sewerage sys ion the sewage system. wer overflow. Level:6 evel of wastewater treat	er settlements. Level:6 tem of a smaller settlem Level:6 ment and sludge treatme	ent. Level:6 ent. Level:6,7	
Methods of carrying out lectures	Ex cathedra teaching Case studies Questions and answers				
Methods of carrying out auditory exercises	Group problem solving Traditional literature ar Computer simulations Workshop	nalysis			
How construction exercises are held	Group problem solving Traditional literature ar Computer simulations Workshop	nalysis			
Course content lectures	1.INTRODUCTION-TEAC Learning outcomes:1 2.WASTE WATER SYSTE 3.ELEMENTS OF THE SE 4.BASIC SCHEMES OF S 5.RACIONAL METHOD, I 6.HYDRAULIC CALCULA DEPTH IN CHANNELS, E 7.VERTICAL GUIDANCE CHANGE OF DIRECTION 8.CHANNEL POSITION II COLLECTORS, TYPE OF 9.CONSTRUCTION OF B Learning outcomes:2,3 10.STRUCTURES IN SEV outcomes:4 I COLLOQUIUM, 1h, Lea 11.SEWAGE PUMPING S 12.COMBAIN SEWER OV 13.WASTE WATER TRE/ 14.WASTE WATER TRE/ 15.II COLLOQUIUM, 1h, ORAL EXAM, 1h, Learni	HING ORGANIZATION, S EM IN URBAN AREA, UWV EWAGE SYSTEM, TYPES A SEWAGE, DETERMINATIO HYDRAULIC CALCULATIO TION OF SEWAGE NETW EXCAVATION LEVEL, VER OF LINE, DEFINITION OF J, 2h, Learning outcomes N ROAD AND HOUSING C CHANNELS, SHAPES AND ISDS FOR PIPES AND INC WAGE SYSTEM, PROTECT ATMENT, 2h, Learning ou VERFLOW STRUCTURES, ATMENT, 2h, Learning ou Learning outcomes:1,2,3 INTATION, 2h, Learning ou Learning outcomes:1,2,1 INTERNT, 2h, Learning ou Learning outcomes:1,2,1 INTERNT, 2h, Learning ou Learning outcomes:1,2,1 INTERNT, 2h, Learning ou Learning outcomes:1,2,1 INTERNT, 2h, Learning ou Learning outcomes:1,2,1	OURCES AND TYPES OF F VTD REVIEW, HISTORY O IND SELECTION OF THE S N OF WASTE WATER VOL N OF SEWAGE NETWORH ORK, LIMITATION: LONGI TICAL GUIDANCE OF LINE INVERT LEVEL, CHANGE ::2,3 CONNECTORS, STATIC CA O CHARACTERISTICS, 2h, ORPORATION FOR PIPE, 1 ION STRUCTURES, VENT ICON STRUCTURES, VENT Itcomes:4 2h, Learning outcomes:4 tcomes:5 tcomes:5 3,4,5	OLLUTION, TYPES OF W F SEWAGE, 2h, Learning SEWAGE SYSTEM, 2h, Le JUMES, 2h, Learning out (, 2h, Learning outcome TUDINAL SLOPES, MININ E, 2h, Learning outcomes OF CHANNEL LEVELS, C LCULATIONS OF COLLE Learning outcomes:2,3 WATERPROOF TESTING ILATION OF SEWAGE SY	ASTE WATER, 2h,) outcomes:1 :arning outcomes:2 :comes:2 :s:1,2 AUM PROFILES, WATER :s:1,2 CHANNEL LAYOUTS, CTOR, SEWAGE FOR CHANNELS, 2h, STEM, 1h, Learning
Course content auditory	1.PROGRAM ASSIGN, SI 2.NO TEACHING, 2h 3.NO TEACHING, 2h 4.HYDRAULIC CALCULA 5.NO TEACHING, 2h 6.NO TEACHING, 2h 7.NO TEACHING, 2h 9.NO TEACHING, 2h 10.NO TEACHING, 2h 11.PUMPING STATION, 12.NO TEACHING, 2h 13.COMBINED SEWER (14.NO TEACHING, 2h 15.CONSTRUCTION SIT	EWAGE NETWORK SETTI TION OF SEWAGE NETW 2h, Learning outcomes:4 DVERFLOW, 2h, Learning E VISITING, 2h, Learning	NG AND CATCHMENT AR ORK AND LONGITUDINAL outcomes:4 outcomes:5	EAS, 2h, Learning outco - PROFILES, 2h, Learning	mes:1,2 3 outcomes:3
Course content constructures	1.NO TEACHING, 2h 2.SEWAGE NETWORK S 3.SEWAGE NETWORK S 4.NO TEACHING, 2h 5.HYDRAULIC CALCULA 6.HYDRAULIC CALCULA	ETTING AND CATCHMEN ETTING AND CATCHMEN TION OF SEWAGE NETW TION OF SEWAGE NETW	T AREAS, 2h, Learning o T AREAS, 2h, Learning o ORK AND LONGITUDINAL ORK AND LONGITUDINAL	utcomes:1,2 utcomes:1,2 _ PROFILES, 2h, Learning _ PROFILES, 2h, Learning	g outcomes:3 g outcomes:3

	7.HYDRAULIC CALCULATION OF SEWAGE NETWORK AND LONGITUDINAL PROFILES, 2h, Learning outcomes:3
	8.HYDRAULIC CALCULATION OF SEWAGE NETWORK AND LONGITUDINAL PROFILES, 2h, Learning outcomes:3
	9. HYDRAULIC CALCULATION OF SEWAGE NETWORK AND LONGITUDINAL PROFILES, 2n, Learning outcomes:3
	10. In TEACHING 25
	11.NO TEACHING, 211
	13 NO TEACHING 2h
	14.COMBINED SEWER OVERFLOW, 1h. Learning outcomes:4
	PROGRAM SUBMIT, 1h, Learning outcomes:3,4,5
	15.NO TEACHING, 2h
Required materials	Basic: classroom, blackboard, chalk
	General purpose computer laboratory
	whiteboard with markers
	Overhead projector
Exam literature	1.Ćosić-Flajsig, G,: Interna skripta kolegija Opskrba vodom i odvodnja II, Ak.god. 2015/2016
	2.Margeta, J.(1998): Kanalizacija naselja, GF Split, GF Osijek, IGH,PC Split
Students obligations	A minimum of 23 points should be collected to get a signature:
	Minimum Q naista an each cellaruium (16 aut 6 46 naista)
	- Minimum 3 points on each conoquium (10 out of 46 points)
	- Minimum - points from the program (7 out of 14 points)
Knowledge	Collection is mandatory. During the constant, 2 colleguies are onlying and (a combination of theoretical and practical
evaluation during	knowledge presented in the lectures) through which students receive points. Total can be collected 2 x 23 points = 46
semester	points. To pass the exam, students must have a minimum of 12 credits per exam, and as a precondition for signing 8
	points per colloquium.
	Childrets may attend one additional correctional avam (grade Leallequium or II collequium) if they have not correct
	sufficient score or have been legitimately prevented.
Knowledge	In the 16th week of the academic year a final oral exam will be taken that can result in a grade in the course of a
evaluation after	course if the student is on a continuous basis during the semester and the knowledge student has demonstrated. With
semester	the points the student has accumulated during the semester, the student can get 40 points at the final examination by
	verbal exam.
	Students who collected 60 points and more passed the exam with the following success:
	- 60 and more points - sufficient (2)
	- 67 and more points - good (3)
	- 75 and more points - very good (4)
	- 85 and more points - excellent (5)
Student activities:	Aktivnost ECTS
	(Written exam) 2
	(Project) 1
Demonda.	(Urai exam) 2
Remark	This course can be used for final thesis theme.
Prerequisites:	Students cannot enroll in this course unless they have completed Upskrba vodom Lodvodnja l Students cannot pass this course unless they have passed Opskrba vodom i odvodnja l
	Sculence cannot pass this course unless they have passed OpSKDd V000111 00V0011jd 1
ISVU equivalents:	39174;147444;
Proposal made by	Gorana Ćosić Flajsig, MSc, Senior lecturer

Code WEB/ISVU	23931/184725	ECTS	5.0	Academic year	2018/2019
Name	Water Use				-
Status	5th semester - Civil and	d Environmental Enginee	ering (Redovni graditeljst	vo) - obligatory course	
Teaching mode	Lectures + exercises (a	auditory + laboratory + s	seminar + metodology +	construction)	30+30 (8+0+0+22)
	work at home				90
Teachers	Lectures:1. mr.sc. Gora	na Ćosić-Flajsig viši pred	davač		
	Lectures:2. dr.sc. Mlade	en Petričec dipl.ing.građ			
	Auditory exercises: Dej	c Mladen Petričec dipl.ing.gr	au. na arađ		
	Construction exercises:	: Dejan Kovačević dipl.in	g.građ.		
Course objectives	Acquirement of the bas	sic theoretical and practi	cal knowledge about the	water use for human co	onsumption, food
	production, hydropowe	r energy production and	other purposes of the w	ater use.	
Learning outcomes:	1.analyse and estimate	e necessary quantity and	l quality of the various w	ater uses. Level:6	
	2.design of the water s	upply system reservoar.	Level:6		
	4. identification of the p	arameters for the hydro	power plant concept). Le	evel:6	
	5.calculate of the possi	ble electric energy prod	uction. Level:6		
	6.propose of the solution	on for irrigation small ag	riculture area. Level:6,7		
Methods of carrying	Ex cathedra teaching				
out lectures	Case studies				
	Demonstration				
	Discussion				
	Questions and answers	; 			
	Seminar, students pres	entation and discussion			
	Teoretical lectures aide	ed by technical equipment	nt and ocassional visit to	laboratory, characterist	tic field locations and
	building site. Printoffs o	of the lectures are availa	ble by web site. Lectures	s are interactive, and the	e part of the lectures is
	analyse of the example	es and discussion to prep	pare students for the futu	ire practical work.	
Methods of carrying	Group problem solving				
exercises	Data mining and knowl	edge discovery on the M	/eh		
	Workshop	eage abcovery on the n			
	Other				
	Problem-solving on the	blackboard, with active	student participation.		
How construction	n Group problem solving				
exercises are lielu	Data mining and knowl	edge discovery on the V	/eb		
	Discussion, brainstormi	ing			
	Preparation of a progra	m individually and in the	e groups, with the help o	f teacher.	
Course content	1.The plan of course co	ntent and exam, 2h			
I ypes or water use, 2n, Learning outcomes:1			1 2 3		
	Water sites, water prod	Juction facilities and wat	er conditioning, 1h, Lear	ning outcomes:1,2,3	
	Water supply systems,	1h, Learning outcomes:	2,3	5	
	Water use and water co	onsumption , 1h, Learnin	ig outcomes:2,3		
	3. Calculation of water s	supply system reservoir	, 2h, Learning outcomes:	:2,3	
	5.Fieldwork. 2h. Learnin	na outcomes:1.2.3.5.6	Learning outcomes.2,5		
	6.Sizeing of water supp	oly system, 2h, Learning	outcomes:3		
	7.Types and basic char	acteristics, pressure test	ts, 1h, Learning outcome	es:3,4	
	Pumping stations, type	s and characteristics, 1h	i, Learning outcomes:3,4		
	9.No lessons				
	10.Irrigation requireme	ents and needs, 1h, Learn	ning outcomes:6		
	Soil ad water - requiren	nents of growing vegeta	ble crops, 1h, Learning o	outcomes:6	
	Types and methodes of	i irrigation, 1h, Learning	outcomes:6	comos:6	
	11.The impact of irrigat	tion on the environment	. 1h. Learning outcomes:	6	
	12.The role of hydropov	wer in the economy and	energy needs, 2h, Learn	ing outcomes:4	
	13.Hydropower calcula	tion and analysis of wate	er flows,, 2h, Learning ou	itcomes:5	
	14.Accumulation mana	gement, 2h, Learning ou	itcomes:5		
		in, Leaning outcomes.	4,5,0		
Course content	1.No lessons				
auditory	2.No lessons				
	3.Preparation of the sit	uational plan i hydraulic	calculation of the water	supply system, 1h, Lear	ning outcomes:1,2,3
	4 No lessons	water supply system, 1	n, Learning outcomes:2,.	3	
	5.No lessons				
	6.No lessons				
	7.Longitudinal profile o	f main pipeline, 1h, Lear	ning outcomes:2,3		
	9.Sludge outlet manhol	le, air valve manhole an	d section valve manhole	1h. Learning outcomes	:2.3
	10.No lessons			,	
	11.First colloquium, 1h	, Learning outcomes:1,2	,3		

	12.Calculation for irrigation of agricultural land, 1h, Learning outcomes:6			
	13.Budget of electricity production, 2h, Learning outcomes:4,5 14.No lessons			
	15.No lessons			
Course content	1.No lessons			
constructures	2.No lessons			
	3.NO lessons 4.Hydraulic calculation of the water supply system, 2h, Learning outcomes:2,3			
	5. Fieldwork, 2h			
	7.Longitudinal profile of main pipeline, 1h, Learning outcomes:2,3			
	8.Longitudinal profile of main pipeline, 4h, Learning outcomes:1,2,3 9.Sludge outlet manhole, air valve manhole and section valve manhole, 3h, Learning outcomes:2,3			
	10.No lessons			
	11.First project - surrender and defense, 2h, Learning outcomes:1,2,3 First Colloquium, 1h, Learning outcomes:1,2,3			
	12.Irrigation calculation of the agricultural area, 1h, Learning outcomes:6			
	13.No lessons 14.Budget of electricity production, 2h. Learning outcomes:4.5			
	15.Second project - surrender and defense, 1h, Learning outcomes:6			
	Third project - surrender and defense, 1h, Learning outcomes:4,5			
Required materials	General purpose computer laboratory			
	Whiteboard with markers Overhead projector			
	Preparation of the calculation related to prepared auditoral exams. Preparation of a program in groups under lecturer			
Exam literature	Osnovna:			
	1. Ćosić-Flajsig Gorana, Petričec Mladen: Interna skripta kolegija Korištenje voda, TVZ, Graditeljski odjel 2. Gulić, Ivan, Opskrba vodom, HSCL, Zagrab 2000			
	3. Margeta, Jure: Vodoopskrba naselja, Planiranje, projektiranje, upravljanje i obrada vode, Sveučilište u Splitu,			
	Građevinsko arhitektonski fakultet, Split, 2010 2. Goroč Dragutin: Navodnjavanja, Građovni godičnjak06. HGDL Zagrob, 1006., str. 315.300.			
	Dodatna:			
	1. Kos, Zorko: Hidrotehničke melioracije- navodnjavanje, Školska knjiga, Zagreb, 1987. 2. Priručnik za hidrotehničke melioracije. I kolo: Il kolo i III kolo - odabrana poglavlja: Hrvatsko društvo za odvodnju i			
	navodnjavanje. Grupa autora, Zagreb, 1985. 2003.			
	 Vuković, Zivko: Osnove hidrotehnike I/1 I/2, Akvamarine, Zagreb, 1996. Stojić, Petar: Hidroenergetika, FGZ Split, 1995. 			
Students obligations	During the semester, 2 colloquium are planned and at least every 7 points need to be collected at each colloquium. During the semester, the preparation of 3 projects is planned and 6 points must be collected.			
Knowledge evaluation during semester	During the semester, 2 colloquies are planned (the combination of theoretical and practical questions presented in lectures and exercises) through which students are receiving points. Total can be collected $1x18 + 1x18 = 36$ points (minimum 9 points for passes colloquium).			
	l project: Water supply system maximum 13/minimum 3 points for signature			
	II project: Irrigation system			
	maximum 3/minimum 1 point for signature			
	III project: Hydropower use			
	maximum 8/minimum 2 points for signature			
	Total: maximum 24 points/minimum 6 points for signature			
	The stuudent can not get the assignment for the next project, if he did not submit the previous project on time.			
Knowledge evaluation after	At the end of the semester, it is mandatory to check the students,s knowledge on the exam, which makes 40 points of assessment. The exam is usually composed of the written and oral part of the exam. An essential requirement for oral			
semester	exam is the achievement of 50 % and more success on the written part.			
	The final grade of the subject is the sum points obtained during the semester and the exam as the percentage of the accepted knowledge and skills, namely:			
	80-80,9 - very good (4)			
	65-79,9 - good (3)			
Student activities:	Aktivnost ECTS			
	(Constantly tested knowledge) 2 (Practical work)			
	(Oral exam) 2			
Remark	This course can be used for final thesis theme			
Prerequisites:	Students cannot pass this course unless they have passed Hidrologija i hidraulika Students cannot enroll in this course unless they have passed Osnove hidrologije i hidraulike Students cannot enroll in this course unless they have passed Zaštita okoliša			
	students cannot enroll in this course unless they have passed Proračun konstrukcija			

	Students cannot enroll in this course unless they have passed Matematika II Students cannot enroll in this course unless they have completed Hidrologija i hidraulika
ISVU equivalents:	22377;155939;
Proposal made by	Gorana Ćosić-Flajisg, M.sc., Senior Lecturer, 28.06.2018.

Code WEB/ISVU	23921/184649	ECTS	5.0	Academic year	2018/2019
Name	Wooden Structures		•		
Status	3rd semester - Underg	raduate professional stud	dy in civil engineering (R	edovni graditeljstvo) - oł	oligatory course
Teaching mode	Lectures + exercises (a	auditory + laboratory + s	seminar + metodology +	· construction)	30+30 (14+0+0+16)
	work at home				90
Teachers	Lectures:1. doc. dr. sc. Lectures:2. prof.vis.šk. Auditory exercises:doc Auditory exercises: Šim Construction exercises Construction exercises	Dean Čizmar dipl. ing. g Boris Baljkas . dr. sc. Dean Čizmar dip ne Serdarević mag. ing. a :doc. dr. sc. Dean Čizma : Šime Serdarević mag. i	rađ. I. ing. građ. aedif. r dipl. ing. građ. ng. aedif.		
Course objectives	Students are prepared laminated timber struc and fire resistance.	to participate in the supe tures) and structures ma	ervision or construction of a	of timber structures (mo erials, with a particular e	nolithic or glued- mphasis on durability
Learning outcomes:	1.alculate basic actions 2.draw a timber-structu 3.calculate a simpler fo 4.check bearing capaci 5.design connections fo 6.make a working draw 7.prepare bill of quanti	2.drouble basic actions and combinations of actions for timber structure. Level:6 2.draw a timber-structure disposition with all elements for spatial stability. Level:6 3.calculate a simpler form of a timber structure. Level:6 4.check bearing capacity of structural elements. Level:6 5.design connections for timber structure members. Level:6,7 6.make a working drawing of a simpler timber structure with connection details. Level:6 7.prepare bill of quantities for timber. Level:6			
Methods of carrying out lectures	Ex cathedra teaching Case studies Demonstration Students will be inform work, and about variou structures is presented Numerical examples ar attentive, they are requ	ed through visual materi is possibilities for the app l in a simple manner thro re provided for every sigi uired to answer appropri	ials (slides, transparencio olication of wooden struc ough written material abo nificant issue considered ate questions during the	es) about wooden structo tures. The design and sh out topics covered during in the course. To keep s lectures.	ures built all over the naping of wooden g the lectures. students focused and
Methods of carrying out auditory exercises	Interactive problem sol Other Students are given inst	lving tructions and example fo	r the preparation of indiv	vidual programs	
How construction	Interactive problem sol	lvina			
exercises are held	Other	, and a second			
	Students are given inst	ructions and example fo	r the preparation of indiv	vidual programs.	
Course content lectures	1. Historic overview of t 2. Systems, methodolog 3. Properties of solid, la 4. Durability and fire ree 5. Design of solid timbe 6. Design of laminated t 7. Fasteners in timber s 8. Joints with direct and 9. Joints with direct and 10. Assembled truss an 11. Design of joints (mo 12. Spatial stability of ti 13. Basis of joint design 14. Basis of joint design	imber structures, 2h, Lea y and examples of erect minated timber and woo sistance, 2h, Learning ou r structures, 2h, Learning timber and wood based e tructures, 2h, Learning o indirect force distributio lindirect force distributio d bending elements , 2h, odern and carpentry), 2h, imber structures, 2h, Lea of laminated timber stru- recting of timber structure	arning outcomes:1 ted structures, 2h, Learn d based materials , 2h, L itcomes:2 g outcomes:2,3 elements, 2h, Learning o outcomes:2,3 on, 2h, Learning outcomes , Learning outcomes:4 , Learning outcomes:5 actures, 2h, Learning out uctures, 2h, Learning out res, 2h, Learning outcomes	ing outcomes:1 Learning outcomes:3 utcomes:4 IS:6 Is:6 Itcomes:3 Itcomes:3 es:6,7	
Course content auditory	 Introduction about pr Elements of layout., 2 Elements of layout., 2 Elements of layout., 2 Elements of layout., 2 Design according to l Learning outcomes:3,4 P.Examples of design c 10 11 I2.Fasteners in timber outcomes:6,7 I3 I4 I5 	oject. Description of a pr 2h, Learning outcomes:1 2h, Learning outcomes:1 Eurocode 5. Load analysi ture according to EC5. Sp of simple elements accord structures. Design of def	roject, structural system ,5 ,5 is. Static check and design patial stability of main st ding to EC5, 2h, Learning tails. Execution details. I	and guidelines. , 2h, Lea on of secondary structura ructure., 2h, Learning ou outcomes:3,4 Description of a project. ,	arning outcomes:1 al elements., 2h, utcomes:3,4 , 2h, Learning
Course content constructures	1 2 3 4.Elements of layout., 2 5.Elements of layout., 2 6 7.Design of secondary	2h, Learning outcomes:1 2h, Learning outcomes:1 structure., 2h, Learning o	,5 ,5 outcomes:3,4		

	 8 9 10.Design of main structure according to EC5, 2h, Learning outcomes:3,4 11.Design of main structure according to EC5, 2h, Learning outcomes:3,4 12 13.Details in timber , 2h, Learning outcomes:6,7 14.Details in timber , 2h, Learning outcomes:6,7
	15.Details in timber structures (final corrections) , 2h, Learning outcomes:1,2,3,4,5,6
Required materials	Basic: classroom, blackboard, chalk Whiteboard with markers Overhead projector Video equipment Each student will prepare a design of a wooden roof truss. The written portion of the design will be produced using MS Word or MS Excel. Drawings will be produced in AutoCAD or another appropriate software program.
Exam literature	 Osnovna: M. Magerle: Drvene konstrukcije, Svojstva drva, PTI, IGH, Zagreb, 1996 (Sveučilišni udžbenik) Z. Žagar: Drvene konstrukcije, Svezak I, Osnove projektiranja drvenih konstrukcija, Pretei, Zagreb, 1999. Sveučilišni udžbenik); A. Bjelanović, V. Rajčić: Drvene konstrukcije preme europskim normama, Građevinski fakultet, 2007. Pisani materijal pripremljen od nastavnika. Additional literature: Handbook 1 - Timber structures, TEMTIS, 2008. Handbook 2 - Design of timber structures according to EC5, TEMTIS, 2008. M. Goeggel : Bemesung im Holzbau, Konstruktionsregeln, Formeln, Tafeln, Rechenwegwe in Beispielen, Bauverlag GmDH, Wisbaden und Berlin, 1980 EUROCODE 1995-1-1.; Design of Timber Structures, Part 1-1, General rules for buildings
Students obligations	Minimal 25% of total points on design project and colloquium
Knowledge evaluation during semester	Approved design project (30 points max) Colloquium (30 points max)
Knowledge evaluation after semester	Written part of examination (40 points): solving problems (practical part) and answering questions (theoretical part) Students with 50% or more on colloquium write only theoretical part. Other must pass practical part and theoretical part
Student activities:	AktivnostECTS(Constantly tested knowledge)2(Practical work)1(Written exam)1(Oral exam)1
Remark	This course can be used for final thesis theme
Prerequisites:	Students cannot pass this course unless they have passed Proračun konstrukcija Students cannot enroll in this course unless they have completed Građevinski materijali Students cannot enroll in this course unless they have passed Matematika I Students cannot enroll in this course unless they have passed Nacrtna geometrija u graditeljstvu I Students cannot enroll in this course unless they have completed Proračun konstrukcija
ISVU equivalents:	22349;155930;
Proposal made by	Dr. sc. Dean Čizmar dipl. ing. građ., 20.6.2018.