UNIVERSITY OF RIJEKA

FACULTY OF CIVIL ENGINEERING

UNDERGRADUATE STUDY PLAN AND PROGRAMME

CIVIL ENGINEERING

Rijeka, September 2024

CURRICULUM

University Undergraduate Study
CIVIL ENGINEERING

General information	
Name of the study programme	University Undergraduate Study of Civil Engineering
Study programme leader	Faculty of Civil Engineering in Rijeka
Study programme provider	Faculty of Civil Engineering in Rijeka
Type of study program	University
Level of the study program	Undergraduate
Academic/professional title acquired upon completion of studies	University Bachelor (Baccalaureus) Civil Engineer / University Bachelor (Baccalaurea) Civil Engineer abbreviation: univ. bacc. ing. aedif.

Information about the leader:

Faculty of Civil Engineering in Rijeka
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List of compulsory and elective courses of the module with the number of hours of active teaching required for their implementation and the number of ECTS credits

LIST OF COURSES							
	COURSE	PROFESSOR	L	E	S	ECTS	STATUS[1]
Year: **1.**							
Semester I – winter	Physics	Prof. Boris Podobnik, Ph.D.	15	30	0	4	M
	Engineering Informatics	Assoc. Prof. Neira Torić Malić, Ph.D.	5	30	15	5	M
	Constructive Geometry	Maura Jurić, Lecturer	30	30	0	5	M
	Mathematics 1	M.Sc. Ines Radošević Medvidović, Senior Lecturer	45	45	0	9	M
	Introduction to Civil Engineering	Assoc. Prof. Silvija Mrakovčić, Ph.D.	20	0	10	3	M
	Foreign language – one of the following is chosen:					3	M
	English Language	Saša Čohar Mančić, Senior Lecturer	10	15	5	3	E
	German Language	Saša Čohar Mančić, Senior Lecturer	10	15	5	3	E
Semester II – summer	Building Elements	Assoc. Prof. Iva Mrak, Ph.D.	30	30	0	6	M
	Geodesy	Andrej Marinović, Senior Lecturer	30	15	0	4	M
	Engineering Materials	Asst. Prof. Natalia Bede Odorčić, Ph.D.	30	15	0	4	M
	Mathematics 2	Assoc. Prof. Anamarija Perušić, Pribanić Ph.D.	45	45	0	8	M
	Fundamentals of Statics	Asst. Prof. Edita Papa Dukić, Ph.D.; Asst. Prof. Nina Čeh, Ph.D.	30	30	0	6	M
	Geology	Assoc. Prof. Petra Jagodnik, Ph.D.	20	10	0	3	M

[1] **M** – the subject is mandatory; **E** – the subject is elective.

LIST OF COURSES							
	COURSE	PROFESSOR	L	E	S	ECTS	STATUS
Year: **2.**							
Semester III – winter	Hydrology	Prof. Nevenka Ožanić, Ph.D.	30	15	0	4	M
	Solid Body Mechanics 1	Assoc. Prof. Leo Škec, Ph.D.	30	30	0	6	M
	Fundamentals of Dynamics	Asst. Prof. Nina Čeh, Ph.D.	30	30	0	5	M
	Fundamentals of Road Design 1	Prof. Aleksandra Deluka-Tibljaš, Ph.D.; Assoc. Prof. Sanja Šurdonja, Ph.D.	30	30	0	5	M
	Concrete and Asphalt Technology	Assoc. Prof. Silvija Mrakovčić, Ph.D.	15	15	0	3	M
	Probability and Statistics	Prof. Boris Podobnik, Ph.D.	30	15	0	4	M
	Elective courses					3	
	Communication Skills	External Lecturer	15	15	0	3	E
	Building and Constructing English	Saša Čohar Mančić, Senior Lecturer	15	10	5	3	E
	Fundamentals of Building Physics	Prof. Ivica Kožar, Ph.D.	20	0	10	3	E
	Computer Programs	Assoc. Prof. Neira Torić Malić, Ph.D.	0	30	0	3	E
	Introduction to Programming	Prof. Ivica Kožar, Ph.D.	10	20	0	3	E
	UNIRI Subject						E
	YUFE Subject						E
Semester IV – summer	Civil Engineering Regulations	Prof. Diana Car-Pušić, Ph.D.; Assoc. Prof. Ivan Marović, Ph.D.	30	0	0	3	M
	Hydromechanics	Prof. Nevenka Ožanić, Ph.D.; Asst. Prof. Elvis Žic, Ph.D.	30	30	0	5	M
	Solid Body Mechanics 2	Asst. Prof. Sara Grbčić Erdelj, Ph.D.	30	30	0	5	M
	Soil and Rock Mechanics	Prof. Željko Arbanas, Ph.D.; Asst. Asst. Prof. Josip Peranić, Ph.D.	45	30	0	5	M
	Statics of Linear Structures 1	Asst. Prof. Teo Mudrić, Ph.D.	30	30	0	6	M
	Construction Technology	Prof. Diana Car-Pušić, Ph.D.	20	10	0	3	M
	Introduction to the Design of Civil Engineering Structures	Prof. Adriana Bjelanović, Ph.D.; Prof. Ivana Štimac Grandić, Ph.D.	20	10	0	3	M

LIST OF COURSES							
	COURSE	PROFESSOR	L	E	S	ECTS	STATUS
Year: **3.**							
Semester V – winter	Construction Organization	Prof. Diana Car-Pušić, Ph.D.	30	30	0	4	M
	Fundamentals of Concrete Ctructures	Prof. Davor Grndić, Ph.D.	45	30	0	6	M
	Fundamentals of Hydraulic Engineering	Prof. Barbara Karleuša, Ph.D.	30	30	0	5	M
	Fundamentals of Road Design 2	Prof. A. Deluka-Tibljaš, Ph.D.; Marijana Cuculić, Ph.D, Senior Lecturer	20	25	0	4	M
	Statics of Linear Structures 2	Assoc. Prof. Dragan Ribarić, Ph.D.	30	30	0	5	M
	Professional Practice 1	Prof. Diana Car-Pušić, Ph.D.	0	0	90	3	M
	Elective courses					3	
	Fundamentals of Unsaturated Soil Mechanics	Asst. Prof. Josip Peranić, Ph.D.	20	0	10	3	E
	Fundamentals of Spatial Planning	Bojan Bilić, Senior Lecturer	20	0	10	3	E
	Environmental Protection and Sustainable Construction	Assoc. Prof. Sanja Dugonjić Jovančević, Ph.D.	10	0	20	3	E
	Communication Skills	External Lecturer	15	15	0	3	E
	Building and Constructing English	Saša Čohar Mančić, Senior Lecturer	15	10	5	3	E
	Fundamentals of Building Physics	Prof. Ivica Kožar, Ph.D.	20	0	10	3	E
	Computer Programs	Assoc. Prof. Neira Torić Malić, Ph.D.	0	30	0	3	E
	Introduction to Programming	Prof. Ivica Kožar, Ph.D.	10	20	0	3	E
	UNIRI Subject						E
	YUFE Item						E

LIST OF COURSES							
	COURSE	PROFESSOR	P	V	S	ECTS	STATUS
Year: **3**							
Semester VI – Summer	Construction Economics	Prof. Diana Car-Pušić, Ph.D.	20	20	0	3	M
	Fundamentals of Steel Structures	Asst. Prof. Paulina Krolo, Ph.D.	30	30	0	5	M
	Fundamentals of Geotechnical Engineering	Prof. Željko Arbanas, Ph.D.; Asst. Prof. Martina Vivoda Prodan, Ph.D.	30	30	0	5	M
	Professional Practice 2	Prof. Diana Car-Pušić, Ph.D.	0	0	90	3	M
	Undergraduate Thesis	mentor	0	0	150	5	M
	Elective courses					4	
	Hydrotechnical Measures for Adaptation to Climate Change	Prof. Vanja Travaš, Ph.D.	30	0	15	4	E
	Construction Management	Assoc. Prof. Ivan Marović, Ph.D.	30	0	15	4	E
	Bridges	Prof. Ivana Štimac Grandić, Ph.D.	30	15	0	4	E
	Fundamentals of Engineering Geology	Assoc. Prof. Petra Jagodnik, Ph.D.	15	20	10	4	E
	Building Design	Assoc. Prof. Iva Mrak, Ph.D.	20	25	0	4	E
	Field Testing in Geotechnics	Asst. Prof. Martina Vivoda Prodan, Ph.D.	15	15	15	4	E
	Railway Engineering	Assoc. Prof. Sanja Šurdonja, Ph.D.	25	20	0	4	E
	Elective courses					5	
	Experimental Soil Mechanics	Assoc. Prof. Vedran Jagodnik, Ph.D.	15	15	30	5	E
	Urban Roads and Intersections	Prof. A. Deluka-Tibljaš, Ph.D.; Assoc. Prof. Sanja Šurdonja, Ph.D.	30	30	0	5	E
	Maintenance of Structures	Rosanda Ivetic Salopek, Lecturer	30	15	0	5	E
	Fundamentals of Timber Structures	Prof. Adriana Bjelanović, Ph.D.	30	30	0	5	E
	Fundamentals of Coastal Engineering	Asst. Prof. Nino Krvavica, Ph.D.	30	30	0	5	E

LIST OF COURSES

General information		
Course leader	Prof. Diana Car-Pušić, Ph.D.	
Course	**Construction Economics**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**3.0**
	Number of hours (L+E+S)	**20+20+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

The goal is to acquire the knowledge necessary for cost analysis and calculations of construction works.

1.2. Conditions for enrolment in courses

Construction Technology – passed
Construction Organization – *enrolled*

1.3. Expected learning outcomes for the subject

1. Interpret the basic concepts of construction economics.
2. Interpret specific concepts from the economics of construction.
3. Elaborate in writing and orally a problem in the field of construction economics using appropriate terminology.
4. To make a complete offer for the construction of a medium-complex building or high-rise building.

1.4. Content of the course

1. Norms in construction.
2. Norms of construction works – preparatory, earthwork, carpentry, reinforcement, concrete, masonry, transmissions, craftsmanship.
3. Standardization of machine work.
4. Cost structure in construction - material costs, labor costs, machine labor costs, machine labor costs, machine depreciation, direct and indirect costs, structure of indirect costs on the construction site, company management costs, additional calculation, calculation factor, price analysis, construction work price calculations.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

70% attendance at exercises. 70% of attendance at lectures. Colloquiums. Program. Exam.

1.8. Monitoring student work

Attending classes	1.3	Teaching activity		Seminar paper		Experimental work	
Written exam	0.7	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	0.5	Report		Practical work	
Portfolio		Program	0.5				

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Creation and submission of the program, attendance and activity in class – 70%, exam – 30%.
According to the current Ordinance on Studies of the University of Rijeka and the Ordinance on Evaluation and Evaluation of Work
students at the Faculty of Civil Engineering, University of Rijeka

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Lectures and exercises at LMS Merlin
2. Katavić, M., Basics of Economics for Builders, Croatian University Press, Croatian Association for Construction Organization. Zagreb, 2009.
3. Bučar, G., Norms and Prices in Construction, ICG d.o.o., Omišalj, Faculty of Civil Engineering in Rijeka, Rijeka, 2003.
4. Norms and Standards of Work in Construction, Construction Book, Belgrade, Belgrade 2001.
5. Standard Calculation of Works in Building Construction, Bulletin, Institut IGH, d.d., Zagreb

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Linarić, Z. Construction Machinery; Machine labor costs https/www.grad.unizg.hr/_download/repository/troskovistrojnograda.pdf

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Lectures and exercises at LMS Merlin	online	50
Katavić, M., Basics of Economics for Builders, Croatian University Press, Croatian Association for Construction Organization. Zagreb, 2009.	7	
Bučar, G., Norms and Prices in Construction, ICG d.o.o., Omišalj, Faculty of Civil Engineering in Rijeka, Rijeka, 2003.	4	
Norms and Standards of Work in Construction, Construction Book, Belgrade, Belgrade 2001.	1	
Standard Calculation of Works in Building Construction, Bulletin, Institut IGH, d.d., Zagreb	1+ online	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Iva Mrak, Ph.D.	
Course	**Building Elements**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	6.0
	Number of hours (L+E+S)	30+30+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Developing general and special knowledge in the field of design and construction of high-rise buildings.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

1. Distinguish between basic building elements and materials in construction
2. Define the basic details of building structures and ways of connecting them into a whole
3. Identify different types of projects, read blueprints of various types and scales
4. Explain the basic principles of building physics
5. Create a part of the technical documentation of a simple building according to the rules of technical drawing
6. Distinguish the levels of spatial plans and identify the elements of spatial plans necessary for the design of different types of buildings

1.4. Content of the course

1. Structural systems, materials in construction, physical influences on buildings.
2. Foundations, waterproofing, thermal insulation.
3. Massive masonry structures (stone, brick), massive monolithic structures (concrete, reinforced concrete), lightweight structures (wood, steel).
4. Ceilings, vaults, floors.
5. Arches and lintels, doors and windows.
6. Staircases (massive, light).
7. Pitched roofs, roof coverings, flat roofs, green roofs, chimneys and ventilation.
8. Plasters and coatings.
9. Drafts
10. Construction and Spatial Planning, Spatial Plans

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☒ Independent tasks ☒ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%
Satisfaction of activities that evaluate the acquisition of learning outcomes:
1. Regular attendance, at least 70%;
2. Active teaching and solving tasks;
3. Creating a program;
4. Knowledge test;
5. Final exam (written).

1.8. Monitoring student work

Attending classes	2	Teaching activity	0,5	Seminar paper		Experimental work	
Written exam	1	Viva voce		Essay		Research	
Project	2	Continuous Knowledge Assessment	0,5	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Technical Encyclopedia, Miroslav Krleža Institute of Lexicography, Zagreb, 1963-1997
2. Sorić, Z.: Masonry Structures I, Croatian Association of Civil Engineers, Zagreb, 1999.
3. Crnković, B., Šarić, Lj., Construction with Natural Stone, IGH, 2003.
4. Štulhofer, A. and Veršić, Z.: Drawing Architectural Designs: Accessories and Basics, Zagreb, 1998.
5. Peulić, Đ.: Constructive Elements of Buildings I, II, Technical Book, Zagreb, 1986.
6. Vrkljan, Z.: Equipment of Building Designs, Zagreb, 1965.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Francis D. K. Ching, Building Construction Illustrated, Wiley, New Jersey, USA, 2014.
2. Andrea Deplazes (eds), Constructing Architecture: Materials, Processes, Structures: a Handbook, Darch Eth, 2008.
3. Torricelli, M.C., Del Nord, R., Felli, P., Materials and technologies of architecture, Editori Laterza, 2012.
4. Quaderni del Manuale di progettazione edilizia, Hoepli, 2006.
5. Ripamonti, M.E., Dolce, F.C., Thermal bridges, analysis and solution hypotheses. Dario Flaccovio, 2011.
6. Rex, S. Industrial Way of Construction I and II, IGH Faculty of Civil Engineering, Zagreb, 1983.
7. Technology of Wooden Buildings, Mozaik knjiga, 2001.
8. Buđevac, D., Metal Structures in Buildings, Construction Book, 2000.
9. Production programs of construction products.
10. Additional literature according to the topics of lectures recommended during classes

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Technical Encyclopedia, Miroslav Krleža Institute of Lexicography, Zagreb, 1963-1997	1	100
Sorić, Z.: Masonry Structures I, Croatian Association of Civil Engineers, Zagreb, 1999.	21	
Crnković, B., Šarić, Lj., Construction with Natural Stone, IGH, 2003.	4	
Štulhofer, A. and Veršić, Z.: Drawing Architectural Designs: Accessories and Basics, Zagreb, 1998.	3	
Peulić, Đ.: Constructive Elements of Buildings I, II, Technical Book, Zagreb, 1986.	20	
Vrkljan, Z.: Equipment of Building Designs, Zagreb, 1965.	6	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Boris Podobnik, Ph.D.	
Course	**Physics**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**15+30+0**

1. DESCRIPTION OF THE COURSE		
1.1. Course objectives		
Developing general and specific knowledge in the field of physics.		
1.2. Conditions for enrolment in courses		
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1.3. Expected learning outcomes for the subject		
1. Define and explain basic physical quantities and units of measurement. 2. Explain and apply the laws of mechanics, kinematics and dynamics. 3. Define the laws of fluid motion. 4. Define basic thermodynamic quantities and processes. 5. Know the basics of the theory of oscillation and waves. 6. Know the basics of the theory of electricity and magnetism. 7. Define the basic assumptions of the structure of matter and the interaction of substances. 8. Apply the acquired knowledge to solve problem problems.		
1.4. Content of the course		
1. Introduction. Physical quantities and units. International System of Units. Scalar and vector physical quantities 2. Kinematics and dynamics in mechanics. 3. Fluidi. Statika fluida. 4. Fluids. Fluid motion. Bernoulli's equation. 5. Mechanical oscillation. 6. Mechanical waves. Electromagnetic waves. 7. Heat and heat transfer. 8. Fundamentals of thermodynamics.		
1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments	There are two control tasks and a final exam.	

1.7. Obligations of students

Attendance at least 70%.
Satisfaction of activities that evaluate the acquisition of learning outcomes:
1. Regular attendance, at least 70%;
2. Active teaching and solving tasks;
3. Knowledge test;
4. Final exam (written).

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1.5	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Kilić, S.: Physics I, Faculty of Civil Engineering in Split
2. Cindro, N.: Physics I, Školska knjiga, Zagreb 1981.
3. Cindro, N.: Physics II, Školska knjiga, Zagreb 1981.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Kilić, S.: Physics I, Faculty of Civil Engineering in Split	5	100
Cindro, N.: Physics I, Školska knjiga, Zagreb 1981.	3	
Cindro, N.: Physics II, Školska knjiga, Zagreb 1981.	3	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Andrej Marinović, Senior Lecturer	
Course	**Geodesy**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**30+15+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Adoption and understanding of basic concepts and terminology in the field of geodesy.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

1. Analyze geodetic bases: maps and plans of different scales.
2. Identify the role of geodetic works in construction in individual phases of design.
3. Calculate the basic elements of staking (vertical and horizontal).
4. Assess the importance of geodetic works in various project tasks and the need to engage geodetic experts.
5. Explain the elements of GIS and apply the basic functions of search in GIS.

1.4. Content of the course

1. Division and basic concepts of geodesy.
2. Geodetic measurements and instruments
3. Geodetic networks and surveys
4. Application of geodesy in construction
5. Geodetic works in various areas of civil engineering and phases of design and construction of buildings
6. Basics of Geoinformation Systems

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at exercises and lectures. Colloquiums.
Creating a program within the framework of exercises.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper		Experimental work	
Written exam	0.75	Viva voce		Essay		Research	
Project	1	Continuous Knowledge Assessment	0.75	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Macarol, S.: Practical Geodesy, Technical Book, Zagreb,
2. Pribičević B., Medak D.: Geodesy in Civil Engineering, V.B.Z. d.o.o. Zagreb 2003.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Janković, M.: Engineering Geodesy I and II
2. Kapetanović N., Selesković F.: Geodesy, University Book, Sarajevo
3. Schofield W.: Engineering surveying, Butterworth Heinemann 2001.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Macarol, S.: Practical Geodesy, Technical Book, Zagreb,	1	100
Pribičević B., Medak D.: Geodesy in Civil Engineering, V.B.Z. d.o.o. Zagreb 2003.	15	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Petra Jagodnik, Ph.D.	
Course	Geology	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	3.0
	Number of hours (L+E+S)	20+10+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

The course introduces students to the basic types of rocks of the lithosphere, as the environments in which and from which they are built. Students will know the ways of rock weather, i.e. the formation of soil, and will be able to classify soil with regard to genesis. The course introduces students to the hydrogeological properties of rocks and soils. It enables the student to recognize phenomena in the field that occur as a result of geomorphological processes. Students will be trained for elementary recognition of the geological structure of the terrain by inspecting geological maps. Students will know the basic methods of geological research for construction purposes.
The course prepares students for the next courses in the field of geotechnics, hydraulic engineering and environmental protection.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

1. Identify and describe the basic types of rocks and soils. Interpret geological structures.
2. Distinguish the ways of wasting rocks and classify soils according to the genetic principle.
3. Understand the hydrogeological properties of rocks and soils.
4. Recognize and classify phenomena due to the action of geomorphological processes.
5. Recognize the geological structure of the terrain based on the interpretation of the geological map.
6. Knowledge of basic methods of field research of locations for construction purposes.

1.4. Content of the course

The structure of the Earth and internal dynamics.
Minerals: physical and chemical properties; systematics of petrogenic minerals.
Rocks: genetic classification; basic types of rocks.
geological structures.
Rock wear and soil formation.
Groundwater: hydrogeological properties of rocks and soils; groundwater zones.
Geomorphological processes: water, flows; karst morphology; Landslides; erosion.
Earthquakes.
Presentation of the geological structure of the terrain: geological mapping; geological structure of the Republic of Croatia.
Fieldwork for construction purposes.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attending lectures and exercises. Preparation for exercises and independent solving of tasks in exercises, with consultations and support from teachers.

1.8. Monitoring student work

Attending classes	1	Teaching activity	0.6	Seminar paper		Experimental work	
Written exam	0.75	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	0.65	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam.
The total proportion of points that can be earned is 70% during classes and 30% in the final exam.
Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Pavelić, D.: General Geology. University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering, 2014
2. Vlahović, T.: Geology for Civil Engineers. University of Split, Faculty of Civil Engineering and Architecture, 2010

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Tišljar, J.: Petrology with the Basics of Mineralogy. Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb, 1999
2. Šestanović, S.: Fundamentals of Geology and Petrography. IV edition. Faculty of Civil Engineering, University of Split, 2001
3. Šestanović, S.: Fundamentals of Engineering Geology - Application in Construction. Geoing, Split 1993.
4. Pollak, Z.: Hydrogeology for Civil Engineers. Poslovna knjiga, Zagreb, 1995.
5. Benac, Č.: Dictionary of Terms in Applied Geology and Geological Engineering. University of Rijeka, 2013.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Pavelić, D.: General Geology. University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering, 2014	3	100
Vlahović, T.: Geology for Civil Engineers. University of Split, Faculty of Civil Engineering and Architecture, 2010	5	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Diana Car-Pušić, Ph.D.; Assoc. Prof. Ivan Marović, Ph.D.	
Course	**Civil Engineering Regulations**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	3.0
	Number of hours (L+E+S)	30+0+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

It is necessary for students of future civil engineers to master the basic concepts, categories, institutes and legal relations in construction in a broad sense.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

1.Interpret the basic legal concepts.
2.Interpret specific concepts of building regulations.
3.Apply the adopted concepts in the interpretation of legal problems in construction.
4.Make appropriate use of the available applicable technical regulations.

1.4. Content of the course

Introduction to Law: Concepts, Categories, Institutes, Branches, Legal Relations
Review and development of national building regulations
Basic legislation in construction (public construction law)
Relations between participants in construction (private construction law)
International Practice and Autonomous Building Regulation (FIDIC)

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☐ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at lectures (at least 70%) and satisfaction of activities that evaluate the acquisition of learning outcomes (colloquium and final exam).

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Construction Act (Official Gazette website)
2. Physical Planning Act (Official Gazette website)
3. Act on Physical Planning and Construction Affairs and Activities (Official Gazette website)
4. Occupational Safety and Health Act (Official Gazette website)
5. Civil Obligations Act (Official Gazette website)
6. Special Customs on Construction (Official Gazette website)

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. FIDIC: Conditions of Contract for Construction, FIDIC, Geneva, 1999.
2. FIDIC: Conditions of Contract for Plant and Design Build, FIDIC, Geneva, 1999.
3. FIDIC: Conditions of Contract for EPC/Turnkey Projects, FIDIC, Geneva, 1999.
4. Rajčić, D., Nikšić, S.: Introduction to Construction Law, Croatian University Publishing and Zagora-Zagorje, Zagreb, 2008.
5. Vukmir, B.: Contracts on Construction and Services of Consulting Engineers, RRIF-Plus, Zagreb, 2009.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Construction Act (Official Gazette website)	online	80
Physical Planning Act (Official Gazette website)	online	
Act on Physical Planning and Construction Affairs and Activities (Official Gazette website)	online	
Occupational Safety and Health Act (Official Gazette website)	online	
Civil Obligations Act (Official Gazette website)	online	
Special Customs on Construction (Official Gazette website)	online	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Nevenka Ožanić, Ph.D.	
Course	**Hydrology**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**30+15+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

To ensure that within the course students master the basic knowledge and notions of hydrological processes and laws. To provide students with a basic insight into the application of statistical methods, as well as the application of probability theory in hydrology. To train students for the independent implementation of elementary hydrological calculations in hydraulic engineering.

1.2. Conditions for enrolment in courses

Constructive Geometry – passed
Probability and Statistics – *enrolled*

1.3. Expected learning outcomes for the subject

1. Analyze the components of runoff and water balance in the catchment area
2. Analyze the spatial and temporal distribution of precipitation in the basin
3. Analyze data on precipitation and runoff processes in the catchment using methods for determining direct runoff
4. Apply mathematical-statistical methods to solve problems
5. Identify the impact of climate change on water resources and water balance

1.4. Content of the course

1. History and definition of hydrology
2. Distribution and circular movement of water
3. Hydrometry (measurements of hydrological parameters, measuring instruments and devices, evaluation of measurement errors)
4. Meteorological and hydrological parameters (precipitation, temperature, evaporation, humidity, water levels, flows, suspended and drawn sediment, water temperature, etc.)
5. Definition of flow curves, duration curve and frequency of observed parameters
6. Basics of application of mathematical-statistical methods and probability theory in hydrology (numerical characteristics of random variables, empirical and theoretical functions of probability distribution, testing of statistical hypotheses, correlation and regression in hydrology)
7. River basin and river hydrography, connection of precipitation and runoff, hydrological balance
8. Small and medium-sized waters – principles and methods of calculation
9. Runoff hydrogram analysis
10. Basics of parametric calculations of large waters (empirical methods, rational method, HTP and ITP curves)
11. Unit and synthetic hydrograms
12. Identify the impact of climate change on water resources and water balance throughout the course content

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☒ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%.
Satisfaction of activities that evaluate the acquisition of learning outcomes: attendance, program, periodic testing of knowledge and final exam.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper		Experimental work	
Written exam	0.75	Viva voce		Essay		Research	
Project	1	Continuous Knowledge Assessment	0.75	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam.
The total proportion of points that can be earned is 70% during classes and 30% in the final exam.
Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Žugaj, R.: Hydrology, RGN faculty, Zagreb, 2002.
2. Bonacci, O.: Meteorological and Hydrological Substrates, Manual for Hydrotechnical Reclamation, Society for Drainage and Irrigation of Croatia, Zagreb, 1984.
3. Pauše, Ž.: Introduction to Mathematical Statistics, Školska knjiga Zagreb, 1993.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Bonacci, O.: Precipitation – the main input quantity in the hydrological cycle, Geing, Split, 1994.
2. Chow, Ven Te, etc.(1988): Applied Hydrology, McGraw-Hill Publishing Co.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Žugaj, R.: Hydrology, RGN faculty, Zagreb, 2002.	18	80
Bonacci, O.: Meteorological and Hydrological Substrates, Manual for Hydrotechnical Reclamation, Society for Drainage and Irrigation of Croatia, Zagreb, 1984.	4	
Pauše, Ž.: Introduction to Mathematical Statistics, Školska knjiga Zagreb, 1993.	4	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Nevenka Ožanić, Ph.D.; Asst. Prof. Elvis Žic, Ph.D.	
Course	**Hydromecanics**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**30+30+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

To ensure that students master the basic elements of engineering perception, reasoning and solving elementary hydrotechnical tasks in the field of hydromechanics (problems in the field of hydrostatics, hydrokinematics, hydrodynamics of liquid flow in pressurized systems, open flow hydraulics and groundwater hydraulics).
To train students for the independent realization of elementary tasks in hydromechanics.

1.2. Conditions for enrolment in courses

Fundamentals of Dynamics – *enrolled*

1.3. Expected learning outcomes for the subject

1. Calculate tasks in hydrostatics
2. Calculate tasks in hydrokinematics and hydrodynamics
3. Calculate tasks from pressurized piping systems
4. Calculate Open Channel Hydraulics Tasks
5. Calculate tasks in the field of groundwater hydraulics

1.4. Content of the course

Basic concepts about liquid. Fields of physical quantities. Physical properties of liquids. Rheological diagram. Forces on the liquid.
Statics of fluids. Fluid state equilibrium equation. Relative dormancy. Swimming and body stability.
Kinematics of fluids. Motion of a liquid particle. Stationarity. The law of conservation of field, the law of conservation of mass.
Fluid dynamics. Equation of conservation of the quantity of motion. The general law of flow of a real liquid. Equation of conservation of kinetic energy. Bernoulli's equation for an ideal and real fluid. Laminar flow. turbulent flow. Boundary layer. Flow resistances, calculation of local and line energy losses. G, T, E lines for pressurized piping system with built-in pumps or turbines.
Potential streaming. Potential flow equations. Boundary conditions. Springs and abysses.
Open flow hydraulics. Prismatic channels. Uniform and non-uniform flow in the channels. Overflow of water over the overflow of a practical profile of curvilinear and polygonal contour. Leakage under the barriers. Hydraulic jump. Sizing of pumpkins/waterfalls.
Groundwater flow. Application of Darcy's Law of Seepage. A wells with a free water face. Wells under pressure. Groups of wells along the impermeable border and watercourse. The Law of Superposition. Incomplete wells under pressure and with a free water face.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☒ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%.
Satisfaction of activities that evaluate the acquisition of learning outcomes: attendance, program, periodic testing of knowledge and final exam.

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce		Essay		Research	
Project	0.5	Continuous Knowledge Assessment	1.5	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam.
The total proportion of points that can be earned is 70% during classes and 30% in the final exam.
Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Jović, V.: Basics of Hydromechanics, Element d.o.o., 2006.
2. Fancev, M.: Fluid Mechanics, Technical Encyclopedia, Volume 8, Zagreb, 1982.
3. Agroskin, I.: Hydraulics, Tehnička knjiga, Zagreb, 1973.
4. Chow, V.T.: Open Channel Hydraulics, Mc Graw-Hill Kogakusha, 1959.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Gjetvaj, G.: Experimental Hydraulics (internal script), 2003.
2. Kobus, H: Hydraulic Modelling, German Association for Water Resources and Land Improvement, Verlag PaulParcy, Hamburg, 1980

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Jović, V.: Basics of Hydromechanics, Element d.o.o., 2006.	7	80
Fancev, M.: Fluid Mechanics, Technical Encyclopedia, Volume 8, Zagreb, 1982.	1	
Agroskin, I.: Hydraulics, Tehnička knjiga, Zagreb, 1973.	3	
Chow, V.T.: Open Channel Hydraulics, Mc Graw-Hill Kogakusha, 1959.	3	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Neira Torić Malić, Ph.D.	
Course	Engineering Informatics	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	5.0
	Number of hours (L+E+S)	5+30+15

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

To give a systematic overview of some basic areas of informatics and computing, the student acquires the ability to independently use computers and computer networks in solving engineering problems.
To give students an overview, purpose and possibilities of various computer applications used in engineering, so that the student can be able to apply an appropriate tool for problem solving, analysis and presentation of the obtained results if necessary.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

1. Work in a Windows operating system environment (work with files, folders, and applications)
2. To devise the concept of solving a practical task in computer tools for engineering computing
3. Solve a practical task using an appropriate computer program applying the principle of computational automation (solution to a general problem)
4. Select the appropriate type of graphical representation of data depending on the type of data and the purpose of the graphic representation
5. Be able to create and edit different types of graphical data representations
6. Be able to interpret the graphical representation of data, and recognize its incorrect application
7. Know the basic principles and possibilities of exchanging files and data between different computer programs (data import and export)
8. Apply cloud work and online collaboration through teamwork

1.4. Content of the course

Engineering packages (basics of working with mathematical calculations)
Application of computers in the field of construction: current state and trends
Exercises:
Practical work on computers.
During the exercises, examples related to lectures are made individually.

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____

1.6. Comments	

1.7. Obligations of students

Attendance at least 70%.
Satisfaction of activities that evaluate the acquisition of learning outcomes: class activity, colloquium, program, final exam.

1.8. Monitoring student work

Attending classes	1,7	Teaching activity		Seminar paper	1	Experimental work	
Written exam	1,3	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The proportion of points that can be earned is 60% during classes and 40% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

Microsoft Excel 2019, https://support.microsoft.com/en, Essential Mathcad for Engineering, Science, and Math, Second Edition

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Bill Jelen & Tracy Systard: Microsoft Excel 2019 VBA and Macros, Microsoft, 2019.
2. Cole N. Knaflic; let's practice Storytelling with Dana, Wiley, 2020.
3. John V. Guttag: Introduction to Computation and Programming Using Pyton, The MIT Press, 2013.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Microsoft Excel 2019,	*online*	100
Brent Maxfield, Essential Mathcad for Engineering, Science, and Math, Second Edition, Academic Press, 2009	1	100

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Asst. Prof. Natalia Bede Odorčić, Ph.D.	
Course	**Engineering Materials**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**30+15+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

The aim of the course is to introduce students to the properties, production methods, testing methods, regulations for quality control and technology of basic materials used in construction.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

- Connect the internal structure with the properties of the main types of building materials: ceramics, polymers, metals and composites.
- Describe the production technology of various building materials.
- Calculate the physical and mechanical properties of building materials.
- Examine the properties of materials, interpret and compare test results.
- Evaluate the advantages and disadvantages of applying different building materials in specific conditions and select the optimal building material for a particular application according to their properties.

1.4. Content of the course

Division of materials, their application and production.
The structure of materials at the micro, meso and macro levels. The relationship of the microstructure with the properties of the material.
Standards and material testing. Processing of test results.
Physical and mechanical properties of materials.
Durable properties of the material.
Failure and breakdown of materials.
Criteria for the selection of building materials according to their purpose.
Basic about composites (concrete and asphalt).
Stone. Binder.
Metal.
Wood.
Polymers.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☒ Independent tasks ☒ Multimedia & Network ☒ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%
Satisfaction of activities that evaluate the acquisition of learning outcomes: activities in class, preparation and defense of reports from laboratory exercises, colloquium and final exam.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper		Experimental work	0.5
Written exam	0.5	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1.5	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Ukrainczyk V: Knowledge of Material, Institute of Civil Engineering of Croatia, Alcor, Zagreb, 2001.
2. Ukrainczyk V: Concrete – Structure, Properties, Technology, Alcor, Zagreb, 1994.
3. Young, J. F.; Mindess, S.; Gray, R. J.; Bentur, A.: The Science and Technology of Civil Engineering Materials, Prentice Hall, 1998
4. Bjegović D., Balabanić G., Mikulić D.: Building Materials – A Collection of Solved Problems, Zagreb, 2007.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Mehta P., Povindar K. Mehta, Paulo J. M. Monteiro: Microstructure, Properties, and Materials, McGraw-Hill Education, 2006
2. Ashby M F, Jones D R: Engineering Materials 1, An Introduction to properties, application and Design. Butterworth Heinemann 2012.
3. William D. Callister and David G. Rethwisch 2018, Materials Science and Engineering: An Introduction, 10th, John Wiley & Sons, New York USA

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Ukrainczyk V: Knowledge of Material, Institute of Civil Engineering of Croatia, Alcor, Zagreb, 2001.	8	80
Ukrainczyk V: Concrete – Structure, Properties, Technology, Alcor, Zagreb, 1994.	10	
Young, J. F.; Mindess, S.; Gray, R. J.; Bentur, A.: The Science and Technology of Civil Engineering Materials, Prentice Hall, 1998	1	
Bjegović D., Balabanić G., Mikulić D.: Building Materials – A Collection of Solved Problems, Zagreb, 2007.	22	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Maura Jurić, Lecturer	
Course	**Constructive Geometry**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**30+30+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Develop the ability of spatial perception and constructively solve tasks with objects in space. Be able to display objects in projections. Encourage a creative approach and critical thinking. Be able to interpret, "read" objects from projections. Develop graphic communication and teamwork.

1.2. Conditions for enrolment in courses

-

1.3. Expected learning outcomes for the subject

After passing the course exam, students will be able to:

1. Apply the rules of technical drawing: types and thicknesses of lines, designations of elements, drawing scales, dimensioning. Solve metric and positional problems on the relations of point, line and plane in space.
2. To show objects in the planes of projections and to perceive objects in space from the projections. Create a simple CAD model.
3. Display angular and rotational bodies in projections graphically and create a CAD model in 3D space. Distinguish between axonometric methods and apply axonometry and oblique projection for a realistic representation of architectural objects. Develop the ability of spatial imagery.
4. Apply conical structures classically and in CAD. Distinguish cases of intersections of geometric solids with a plane and construct these cross-sections, classically and with CAD. Solve simple penetrations of geometric solids and model them with CAD.
5. Define the relations of point, line and plane in a dimensioned projection. Apply drawing scales. Explain the situation of earthworks of a simple object, construct an embankment and a notch in a dimensioned projection and show the transverse profile of the terrain and the object, graphically and in the CAD model.

1.4. Content of the course

Types of projection. Monge's projection. Additional screenings. Verticality in space.
The intersection of the planes and the piercing. Affinity and ellipse. Rotation.
Projection of a figure and a circle. Projection of angular and rotational geometric solids.
Axonometric methods.
Collineation and conics. Sections of polyhedra with a plane.
Cross-sections of the cone and other bodies. Piercings. Racing Straight.
Penetrations of angular and rotary bodies – CAD models.
Quoted projection. Topographic surfaces.
Application of a dimensioned projection (road).

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%.
Passing the point threshold in each of the two programs and in the final exam.

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	0.5	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	2.5
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total share of points that can be obtained is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Babić; Gorjanc; Sliepčević; Szirovicza: Constructive Geometry, IGH, Zagreb, 2000.
2. Niče, dr. Vilko: Descriptive Geometry I, Školska knjiga, Zagreb, 1992.
3. Niče, dr. Vilko: Descriptive Geometry II, Školska knjiga, Zagreb, 1992.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Babić; Gorjanc; Sliepčević; Szirovicza: Constructive Geometry, IGH, Zagreb, 2000.	5	100
Niče, dr. Vilko: Descriptive Geometry I, Školska knjiga, Zagreb, 1992.	3	
Niče, dr. Vilko: Descriptive Geometry II, Školska knjiga, Zagreb, 1992.	5	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	M.Sc Ines Radošević Medvidović, Senior Lecturer	
Course	**Mathematics 1**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**9.0**
	Number of hours (L+E+S)	**45+45+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

By getting acquainted with computational methods, as well as the theoretical basis for these methods, students will be trained to:
- vector and matrix calculus, and thus the solution of a system of linear equations,
- Differential calculus in the case of a function of a variable.

1.2. Conditions for enrolment in courses

-

1.3. Expected learning outcomes for the subject

After passing the course exam, students will be able to:
1. perform computational operations with vectors such as scalar, vector and mixed multiplication,
2. analyze the mutual relations of points, lines and planes in space,
3. perform basic computational operations with matrices and determine the rank, determinant and inverse of the matrix,
4. solve the system of linear equations,
5. determine the eigenvalues and eigenvectors of the matrix,
6. analyze the basic properties of polynomials, rational, exponential, logarithmic, trigonometric, arcus, hyperbolic and area functions,
7. apply the procedures of calculating limits and derivatives,
8. apply limits and derivatives when analyzing the flow of a function or a parametrically given curve, as well as when solving geometric and physical problems.

1.4. Content of the course

Vectors. Analytical geometry in space. Matrices, systems of linear equations, eigenvalues. A real function of a real variable, introduction. Continuity, limits, derivation, applications.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		
1.7. Obligations of students		

Attendance at least 70% of classes. Passing the point threshold on each of the three examinations: the first colloquium, the second colloquium and the final exam.

1.8. Monitoring student work

Attending classes	3	Teaching activity		Seminar paper		Experimental work	
Written exam	2	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	4	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. During classes, it is possible to earn a maximum of 70 points. A maximum of 30 points can be earned on the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Elezović, N.: Linear Algebra, 3rd edition, Element, Zagreb, 2003.
2. Javor, P.: Mathematical Analysis 1, 2nd edition, Element, Zagreb, 2003.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Elezović, N.; Aglić, A.: Linear Algebra - zbir zadataka, 3. izdanje, Element, Zagreb, 2003.
2. Došlić, T.; Sandrić, N.: Mathematics 1, script, Faculty of Civil Engineering, University of Zagreb, 2007.
3. Štambuk, Lj.: Mathematics 1, Faculty of Engineering, University of Rijeka, Rijeka, 2002.
4. Anton, H.: Calculus - A New Horizon, 6th edition, John Wiley and Sons, Inc., New York, 1999.
5. Demidovič, B.P. et al.: Tasks and solved examples from mathematical analysis for technical faculties, Golden marketing - Tehnička knjiga, Zagreb, 2003.
6. Bronštejn, I.N. et al.: Matematički priruč, Golden marketing - Tehnička knjiga, Zagreb, 2004.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Elezović, N.: Linear Algebra, 3rd edition, Element, Zagreb, 2003.	21	100
Javor, P.: Mathematical Analysis 1, 2nd edition, Element, Zagreb, 2003.	5	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Anamarija Perušić Pribanić, Ph.D.	
Course	**Mathematics 2**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**8.0**
	Number of hours (L+E+S)	**45+45+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

By getting acquainted with computational methods, as well as the theoretical basis for these methods, students will be trained to:
- integral calculus in the case of a function of a variable,
- Finding and applying Taylor's polynomials.
- Solving ordinary differential equations.
- Differential and integral calculus in the case of functions of multiple variables.
- solving curved and surface integrals.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

After passing the course exam, students will be able to:
1. apply the procedures for calculating single integrals,
2. Approximate functions with Taylor polynomials and Taylor series.
3. solve some (more important) types of first- and second-order differential equations with initial conditions, especially the first-order linear differential equation and the second-order linear differential equation with constant coefficients,
4. Analyze the function of two or three variables using partial derivatives.
5. apply single, double and triple integrals to geometric and physical problems,
6. Define and explain the basic concepts of vector analysis.
7. apply curved and planar integrals to physical problems.

1.4. Content of the course

Integral calculus, indefinite integral, definite integral, applications of integrals. Taylor's lines. Ordinary differential equations. Functions of multiple variables, introduction. Partial derivatives. Extremes of functions of multiple variables. Double and triple integrals with applications. Scalar and vector fields. Gradient, divergence and rotation. Curves and curve integrals (curve integral of type 1, curve integral of type 2). Surfaces and surface integrals. Divergence theorem, Stokes' theorem.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70% of classes. Passing the point threshold on each of the three examinations: the first colloquium, the second colloquium and the final exam.

1.8. Monitoring student work

Attending classes	3	Teaching activity		Seminar paper		Experimental work	
Written exam	2	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	3	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. During classes, it is possible to earn a maximum of 70 points. A maximum of 30 points can be earned on the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Javor, P.: Mathematical Analysis 1, 2nd edition, Element, Zagreb, 2003.
2. Javor, P.: Mathematical Analysis 2, 2nd edition, Element, Zagreb, 2002.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Elezović, N.: Differential Equations, 4th edition, Element, Zagreb, 2014.
2. Brnetić, I.; Županović, V.: Multiple Integrals, 1st edition, Element, Zagreb, 2019.
3. Burić, T.; Korkut, L.; Krnić, M.; Milišić, J. P.; Pašić, M.; Velčić, I.: Vector Analysis, 4th edition, Element, Zagreb, 2014.
4. Demidovič, B.P. et al.: Tasks and solved examples from mathematical analysis for technical faculties, Golden marketing - Tehnička knjiga, Zagreb, 2003.
5. Bronštejn, I.N. et al.: Matematički priruč, Golden marketing - Tehnička knjiga, Zagreb, 2004.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Javor, P.: Mathematical Analysis 1, 2nd edition, Element, Zagreb, 2003.	5	100
Javor, P.: Mathematical Analysis 2, 2nd edition, Element, Zagreb, 2002.	2	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Leo Škec Ph.D.	
Course	**Solid Body Mechanics 1**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	6.0
	Number of hours (L+E+S)	30+30+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Understand the physical significance of stresses and deformations and their role in simple equilibrium states of a deformable body. To be able to solve problems of material mechanics and deformable structures in which uniaxial or simple stress states occur. Acquire the necessary prior knowledge for the courses Introduction to the Design of Civil Engineering Structures, Mechanics of Solid Bodies 2, Fundamentals of Steel Structures.

1.2. Conditions for enrolment in courses

Mathematics 1 – passed
Mathematics 2 – passed
Fundamentals of Statics – passed

1.3. Expected learning outcomes for the subject

1. Determine displacements, deformations and stresses in linear-elastic behavior of materials
2. Analyze structural elements exposed to simple stress and strain conditions.
3. Size a given girder for basic load cases using the criteria of strength, stiffness, and stability.
4. Identify static uncertainty and solve simple statically indeterminate systems.
5. Identify the problem of loss of stability (buckling) of flat rods.
6. Calculate simpler statically determined and statically indefinite structures according to the theory of plasticity.

1.4. Content of the course

Uniaxial stress, deformation and the relationship between them. Linear elasticity.
Equations of deformable bodies: equilibrium, kinematic and constitutive equations. Stick problems.
Bernoulli's theory of planar deformation of beams. Normal stresses in pure bending and bending by transverse forces.
Geometric features of cross-sections.
Oblique bending.
Bending under the action of longitudinal force. Cross-sectional core.
Analytical determination of displacement on beam girders.
Pure shear. Calculation of welds, bolts and rivets.
Pure torsion. Statically indeterminate torsion problems.
Stability of equilibrium states. Twisting. Dimensioning according to the stability criterion.
Introduction to material nonlinearity. Foundations of the theory of plasticity. Elastoplastic bending.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☒ Multimedia & Network ☒ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70% and completed activities that evaluate the acquisition of learning outcomes (colloquiums).

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	3	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Šimić, V. Resistance of Materials 1, Školska knjiga, Zagreb, 1992.
2. Šimić, V. Resistance of Materials 2, Školska knjiga, Zagreb, 2002.
3. Brnić, J., Turkalj, G. Strength Science 1, Faculty of Engineering, University of Rijeka, 2004.
4. Brnić, J., Turkalj, G. Strength Science 2, Faculty of Engineering, University of Rijeka, 2006.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Alfirević, I. The Science of Strength I, Technical Book, Zagreb, 1995
2. Bazjanac, D. The Science of Strength, Technical Book, Zagreb, 1973
3. Rašković, D. Resistance of materials, Construction Book, Belgrade, 1985
4. Tymoshenko, S. Resistance of materials 1 and 2, Construction Book, Belgrade, 1972, 1966
5. Brčić, V. Resistance of Materials, Construction Book, Belgrade, 1982

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Šimić, V. Resistance of Materials 1, Školska knjiga, Zagreb, 1992	13	80
Šimić, V. Resistance of Materials 2, Školska knjiga, Zagreb, 2002.	7	
Brnić, J., Turkalj, G. Strength Science 1, Faculty of Engineering, University of Rijeka, 2004.	15	
Brnić, J., Turkalj, G. Strength Science 2, Faculty of Engineering, University of Rijeka, 2006.	14	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Asst. Prof. Sara Grbčić Erdelj, Ph.D.	
Course	**Solid Body Mechanics 2**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**30+30+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Understand the tensor character of stresses and deformations and the behavior of a linear-elastic material in multiaxial stress and strain states.
To be able to solve problems of mechanics of materials and deformable structures exposed to multiaxial stress and deformation conditions.
Acquire the necessary prior knowledge for the subjects Fundamentals of Concrete Structures.

1.2. Conditions for enrolment in courses

Solid Body Mechanics 1 - *Enrolled*

1.3. Expected learning outcomes for the subject

1. Perform differential equilibrium and kinematic equations in stress and strain analysis and corresponding transformation equations.
2. Determine the stress and strain tensor components of linear-elastic material behavior.
3. Calculate complex stress and strain states in structures.
4. To size a given beam for complex stress conditions using the criterion of strength and stiffness.
5. Explain the key energy principles of the mechanics of deformable bodies.

1.4. Content of the course

1. Introduction to the multiaxial stress state. Stress vector.
2. Strain tensor. Equilibrium equations.
3. The main stresses. Mohr's circle of stress.
4. Tensor deformation. kinematic equations.
5. Constitutional Equations. A linearly elastic material.
6. Tangential stresses in the cross-sections of beams. Coupled brackets.
7. Complex stress condition in beams due to general longitudinal and transverse loads.
8. Tymoshenko's theory of planar deformation of beams.
9. St. Venant's torsion. Torsion of non-round full sections.
10. Torsion of thin-walled sections. The center of torsion.
11. Potential energy of deformation. Reciprocity of work and displacement.
12. Castigliano's theorems. Unit load method.
13. Critical multiaxial stress condition. Theories of maximum uniaxial stresses and deformations.
14. Flow criteria. The theory of maximum tangential stresses. Energy theories of strength.
15. Calculation according to strength theories.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70% and satisfaction of activities that evaluate the acquisition of learning outcomes (colloquium).

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	1,5	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1,5	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Šimić, V. Resistance of Materials 1, Školska knjiga, Zagreb, 1992.
2. Šimić, V. Resistance of Materials 2, Školska knjiga, Zagreb, 2002.
3. Brnić, J., Turkalj, G. Strength Science 1, Faculty of Engineering, University of Rijeka, 2004.
4. Brnić, J., Turkalj, G. Strength Science 2, Faculty of Engineering, University of Rijeka, 2006.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Alfirević, I.: The Science of Strength I, Tehnička knjiga, Zagreb, 1995
2. Bazjanac, D.: The Science of Strength, Tehnička knjiga, Zagreb, 1973
3. Rašković, D.: Resistance of Materials, Construction Book, Belgrade, 1985
4. Tymoshenko, S.: Resistance of Materials 1 and 2, Construction Book, Belgrade, 1972, 1966
5. Brčić, V.: Resistance of Materials, Construction Book, Belgrade, 1982
6. Srpčič, S. Mechanics of solid bodies, University of Ljubljana, Faculty of Civil Engineering and Geodesy, Ljubljana, 2003
7. Beer, F.P.; Johnston, E.R.: Mechanics of materials, McGraw-Hill, London, 1992
8. Benham, P.P.; Crawford, R.J.: Mechanics of engineering materials, Longman, Harlow, 1988

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Šimić, V. Resistance of Materials 1, Školska knjiga, Zagreb, 1992	13	80
Šimić, V. Resistance of Materials 2, Školska knjiga, Zagreb, 2002	7	
Brnić, J., Turkalj, G. Strength Science 1, Faculty of Engineering, University of Rijeka, 2004	15	
Brnić, J., Turkalj, G. Strength Science 2, Faculty of Engineering, University of Rijeka, 2006	14	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Željko Arbanas, Ph.D.; Asst. Prof. Josip Peranić, Ph.D.	
Course	**Soil and Rock Mechanics**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**45+30+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Preparing students for a basic understanding of soil and rock behavior. It enables students to identify and classify soils and rocks and provides insight into strength and deformability features as well as other features of soil and rock mass behavior. It prepares students for the course Fundamentals of Geotechnical Engineering and other applied subjects.

1.2. Conditions for enrolment in courses

Geology – *enrolled*

1.3. Expected learning outcomes for the subject

1. Classify and recognize soil and rock types in the field
2. List and describe the basic types of research and testing of soil and rock mass in the field and in the laboratory using appropriate standards
3. Describe, select and interpret the laws of strength and deformability of soil and rock mass
4. Recognize and apply the principles of stress transfer in soil and rock mass
5. Describe the processes of water flow and consolidation in the soil.
6. Analyze and calculate soil stresses and associated deformations in soil and rock mass due to the action of geotechnical structures
7. Solve tasks in the field of determination of physico-mechanical characteristics of soil, water flow in the soil and consolidation, stress on the soil and rock mass, and horizontal stresses in the soil

1.4. Content of the course

1. Physical and mechanical properties of soil and rocks
2. Classifications and Identifications of Soils and Rocks
3. Laboratory and field tests of soil and rocks
4. Water in the soil and rock mass
5. Soil strength, rock and rock mass
6. Stresses in the soil and rock mass
7. Breakdown in soil and rock mass
8. Deformability of soil, rock and rock mass
9. Soil consolidation
10. Soil pressure and resistance

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☒ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attending lectures and exercises. Preparation of seminars.

1.8. Monitoring student work

Attending classes	2.5	Teaching activity		Seminar paper		Experimental work	
Written exam	0.75	Viva voce	0.25	Essay		Research	
Project	0.75	Continuous Knowledge Assessment	0.75	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Attending lectures and exercises. Preparation for exercises and independent solving of tasks in exercises, with consultations and support from teachers.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Nonveiller, E.: Soil Mechanics and Building Foundations, Školska knjiga, Zagreb, p.780, 1979.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Verruijt, A.: Soil Mechanics, Delft University of Technology, 2001.
2. Powrie, W.; Soil Mechanics, Design Manual Concept and Applications, Spon Press 2002.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Nonveiller, E.: Soil Mechanics and Building Foundations, Školska knjiga, Zagreb, p.780, 1979.	6	80

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Diana Car-Pušić, Ph.D.	
Course	**Construction Organization**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**30+30+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Acquiring organizational knowledge and skills necessary for organizing the preparation and planning of construction, as well as the management and management of construction.

1.2. Conditions for enrolment in courses

Construction Technology - passed

1.3. Expected learning outcomes for the subject

1. Interpret the basic concepts of construction organization.
2. Elaborate in writing and orally the organizational problem of construction using appropriate terminology.
3. Solve a task from the organization of construction in the preparation of construction (e.g. planning the time required for construction
4. Solve a task from the organization of construction in the construction process (e.g. updating the construction time plan).
5. Acquire IT knowledge necessary to solve organizational problems (e.g. creating dynamic plans).
6. Develop a construction organization project for a medium-complex building (civil engineering or building construction).

1.4. Content of the course

1. Introduction to the organization of construction
2. System and project, basics of construction project management
3. Development of a construction organization project (POG)
4. Organization of construction processes
5. Organization of the construction site
6. Construction planning
7. Organization of participants in the construction process
8. Safety at work

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at lectures and exercises according to the applicable Regulations.
Creating a program.

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce		Essay		Research	
Project	1	Continuous Knowledge Assessment		Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Radujković, M. et al., Organization of Construction, Textbooks of the University of Zagreb, Zagreb, 2015.
2. Radujković, M. et al., Project Planning and Control, University of Zagreb, Zagreb, 2012.
3. Bučar, G., Normatives of Construction Works-Handbook for Construction Entrepreneurship, ICG, Omišalj, Rijeka, 1999.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Bučar G., Carpentry, Reinforcement and Concrete Works on the Construction Site, Faculty of Civil Engineering J.J. Strossmayer, Osijek, 1997.
2. Trbojević, B., Construction Machinery, Belgrade, 1985.
3. Trbojević, B., Organization of Construction Works, Scientific Book, Belgrade, 1992.
4. Linarić, Z., Lexicon of Machines and Equipment for the Production of Building Materials, Business Media Croatia, Zagreb, 2007.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Radujković, M. et al., Organization of Construction, Textbooks of the University of Zagreb, Zagreb, 2015.	10	75
Radujković, M. et al., Project Planning and Control, University of Zagreb, Zagreb, 2012.	12	
Bučar, G., Normatives of Construction Works-Handbook for Construction Entrepreneurship, ICG, Omišalj, Rijeka, 1999.	13	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Davor Grandić, Ph.D.	
Course	**Fundamentals of Concrete Structures**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	6.0
	Number of hours (L+E+S)	45+30+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Students will acquire basic knowledge about the properties of materials, the rules of execution and structural design, as well as the calculation and dimensioning of concrete structures, and thus be able to independently design simpler concrete structures, be associates in the design of more complex structures and participate in the execution of concrete structures of buildings. The acquired knowledge is also the basis for future professional and scientific training in the field of concrete structures and load-bearing structures in general.

1.2. Conditions for enrolment in courses

Introduction to the Design of Civil Engineering Structures - passed
Solid Body Mechanics 1 - passed
Solid Body Mechanics 2 - passed
Statics of Linear Structures 2 - *enrolled*

1.3. Expected learning outcomes for the subject

1. Define the properties of concrete and steel for reinforcement and explain the conditions of joint action of concrete and reinforcement.
2. To size reinforced concrete rectangular and T-section for bending and rectangular reinforced concrete sections for centric and eccentric pressure and train.
3. Size reinforced concrete elements to transverse forces and torsion.
4. Calculate the reinforced concrete slab to the puncture.
5. Determine the second-order effects in slender compressive elements by the nominal curvature method.
6. Define the calculation and construction principles of basic reinforced concrete elements and explain the basic structural principles of buildings.
7. Define the basic concepts of prestressed concrete.

1.4. Content of the course		
General about concrete structures. Properties of concrete and steel for reinforcement. Conditions of joint action of concrete and reinforcement. Adhesion, anchoring and rebar continuation. Reinforcement design. Budget properties of the material. The smallest and largest cross-sectional area of the tensile reinforcement. Dimensioning of rectangular and T-section on bending. Short elements stressed by centric and eccentric pressure. Stress by centric and eccentric tensile force. Local compressive stresses. Elements stressed by transverse forces. Torsion-stressed elements. Calculation of the plates on the breakthrough. Second-order effects in slender compressive elements according to the nominal curvature method. Usability limit states: limitation of cracking without direct calculation and cases where deflection calculation can be omitted. Calculation and construction principles of basic structural elements: beams, slabs, columns, walls, short brackets and wall mounts. Ceiling structures. Frame structures. Basic principles of reinforced concrete structures of buildings. Basic concepts of prestressed concrete.		
1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%.
Satisfaction of activities that evaluate the acquisition of learning outcomes (development and defense of a program task, passing colloquia and final exam).

1.8. Monitoring student work

Attending classes	2.5	Teaching activity		Seminar paper		Experimental work	
Written exam	0.7	Viva voce	0.5	Essay		Research	
Project		Continuous Knowledge Assessment	0.6	Report		Practical work	
Portfolio		Program	1.7				

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes (60%) and at the final exam (40%). Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1.Sorić, Z.; Kišiček T.: Concrete Structures 1, Faculty of Civil Engineering, Zagreb, Zagreb, 2014.
2.Sorić, Z.; Kišiček T.: Concrete Structures 2, Faculty of Civil Engineering, Zagreb, Zagreb, 2018.
3.Tomičić, I.: Concrete Structures, DHGK, Zagreb, 1996.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Tomičić, I.: Manual for the Calculation of Reinforced Concrete Structures, DHGK, Zagreb, 1993.
2. Zilch, K.; Zehetmaier, G.: Design in constructive concrete construction according to DIN 1045-1 (version 2008) and EN 1992-1-1 (Eurocode 2), Springer-Verlag, Berlin Heidelberg, 2006, 2010.
3. Mosley, B.; Bungey, J.; Hulse, R.: Reinforced Concrete Design to Eurocode 2, Palgrave Macmillan, Hampshire – New York, 2007.
4. Martin, L.A.; Purkiss, J.A.: Concrete Design to EN 1992, Butterworth-Heinemann, Oxford - London, 2006.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Sorić, Z.; Kišiček T.: Concrete Structures 1, Faculty of Civil Engineering, Zagreb, Zagreb, 2014.	10	75
Sorić, Z.; Kišiček T.: Concrete Structures 2, Faculty of Civil Engineering, Zagreb, Zagreb, 2018.	10	
Tomičić, I.: Concrete Structures, DHGK, Zagreb, 1996.	13	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Asst. Prof. Paulina Krolo, Ph.D.	
Course	**Fundamentals of Steel Structures**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**30+30+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

To ensure that within the course students master theoretical and practical knowledge that will enable them to:
- design of simple steel structures (simple buildings, hall structures)
- Design of basic standard screw and welded joints

Gain prior knowledge of steel and composite structures.

1.2. Conditions for enrolment in courses

Introduction to the Design of Civil Engineering Structures - passed
Solid Body Mechanics 1 - passed
Solid Body Mechanics 2 - passed
Statics of Linear Structures 2 - *enrolled*

1.3. Expected learning outcomes for the subject

1. To connect knowledge about the behavior of steel and its influence on the resistance of structural elements
2. To make a draft of a layout solution of a simple construction (e.g. an industrial hall without a crane track)
3. Recognize the structural systems of halls, describe parts of the hall, explain and apply the hall stabilization system
4. Calculate the effects of action at the level of structural elements of statically determined systems
5. Calculate the resistance of simple structural elements for the ultimate limit state and the serviceability limit state
6. Calculate typical bolted and welded joints
7. Create a draft of a standard connection

1.4. Content of the course

- Basic concepts and steel production. Mechanical properties of steel. Types and qualities of steel in construction.
- Basics of structural reliability.
- Actions on the structure. Representative values of the action. partial coefficients of safety. Combinations of actions.
- Rotational capacity of cross-sections. Cross-sectional classes. Reduction of the cross-section.
- Cross-sectional resistance (longitudinal force, bending, transverse force). Interaction of longitudinal force, bending, transverse force.
- Resistance of structural elements (Tensile and compressive resistance of rods, resistance of elements exposed to bending)
- Framework systems. Frame components. Classification of frames (binding systems, frame systems). Supported and unsupported frameworks. Movable and stationary frames.
- Structural design
- Connections and connections: Types of fasteners and calculation of connections. Technologies for the execution of welded joints. Quality Controls of Welded Joints
- Design and construction of halls: Parts of the hall; Types of halls and grids; Hall stabilization and hall cladding
- Corrosion and fire protection

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%.
Satisfaction of activities that evaluate the acquisition of learning outcomes: preparation and submission of a program assignment, passing one colloquium, passing the final exam.

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	0.8	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1.2	Report		Practical work	
Portfolio		Program task	1				

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Androić B.; Dujmović D.: Steel Structures - Part 1., Fair, Zagreb, 2021
2. Androić B.; Dujmović D.: Steel Structures - Part 2, Fair, Zagreb, 2021

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Dujmović, D.; Androić, B.; Džeba, I.: Modeling of Metal Structures according to EUROCODE 3, IA Projektiranje, Zagreb, 2004.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Androić B.; Dujmović D.: Steel Structures - Part 1., Fair, Zagreb, 2021	21	75
Androić B.; Dujmović D.: Steel Structures - Part 2, Fair, Zagreb, 2021	18	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Asst. Prof. Nina Čeh, Ph.D.	
Course	**Fundamentals of Dynamics**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**30+30+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Understand Newton's laws of dynamics on examples of motion of material particles and solids.
To be able to apply these principles to simple problems of dynamics.
Acquire the necessary prior knowledge for the subjects of Hydromechanics.
Understand the oscillatory behavior of simple systems.

1.2. Conditions for enrolment in courses

Mathematics 1 – passed
Mathematics 2 – passed
Fundamentals of Statics – passed

1.3. Expected learning outcomes for the subject

1. Analyze problems involving friction.
2. Explain and mathematically and graphically describe simple and complex motions of a material point.
3. Explain and mathematically and graphically describe simple and complex motions of a rigid body.
4. Determine kinematic and dynamic quantities for complex motion of body systems.
5. Determine kinematic and dynamic quantities using one of the calculation methods for body dynamics.
6. Determine the dynamic quantities and characteristics of simple oscillatory systems.

1.4. Content of the course

Newton's laws of mechanics. Equations of motion.
Contact forces and friction.
The kinematics of the particle and the vector character of position, velocity, and acceleration.
Kinematics and dynamics of curvilinear motion of a material particle.
Impulse of force and amount of movement. Moment of the amount of movement.
Work and energy.
Application of the laws of dynamics to solids. Euler's equations and moments of inertia.
Movement of rigid bodies in a plane. Its own moment of the amount of motion.
The movement of a rigid body in space.
Oscillations of simple systems.

1.5. Types of teaching

☒ lectures	☐ Independent tasks
☐ seminars and workshops	☐ Multimedia & Network
☐ exercises	☐ laboratory
☐ Distance education	☐ Mentoring work
☐ Field Teaching	☐ Other_____

1.6. Comments	

1.7. Obligations of students

Attendance at least 70% and satisfaction of activities that evaluate the acquisition of learning outcomes (colloquia).

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	0.5
Written exam	1	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1.5	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. M. Krpan, A. Franulović, M. Butković, R. Žigulić, S. Braut, Dynamics – Theory and Application, University of Rijeka, Faculty of Engineering, Rijeka, 2001.
2. Čaušević, M.: Technical Mechanics -- Kinematics, Školska knjiga, Zagreb

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Beer, F.P.; Johnston, E.R., Jr.: Vector Mechanics for Engineers - Dynamics, McGraw-Hill, Singapore, 1990
2. Meriam, J.L; Engineering Mechanics - Vol. 2. Dynamics, Wiley, New York, 1978
3. Pytel, A.; Kiusalaas, J.: Engineering Mechanics ? Dynamics, Harper Collins, New York, 1996
4. Kiričenko, A.: Technical Mechanics -- Part II: Kinematics, Universities of Osijek and Zagreb.
5. Kiričenko, A.: Technical Mechanics -- Part III: Dynamics, University of Zagreb
6. Jecić, S.: Mechanics II -- Kinematics and Dynamics, Tehnička knjiga, Zagreb
7. Andrejev, V; Mechanics – Part 2: Kinematics and Part 3: Dynamics, University of Zagreb

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Krpan M., Franulović A., Butković M., Žigulić R., Braut S.. Dynamics – Theory and Application, University of Rijeka, Faculty of Engineering, Rijeka, 2001	11	80
Čaušević, M.: Technical Mechanics – Kinematics, Školska knjiga, Zagreb	5	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Željko Arbanas, Ph.D.; Asst. Prof. Martina Vivoda Prodan, Ph.D.	
Course	**Fundamentals of Geotechnical Engineering**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	5.0
	Number of hours (L+E+S)	30+30+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Introducing students to the basics of geotechnical engineering. It provides students with the basics of geotechnical analyses as well as the acquisition of knowledge and skills in the design of basic and other geotechnical structures made on the ground, in the ground and from the ground and represents the basis for successful mastering of other subjects.

1.2. Conditions for enrolment in courses

Soil And Rock Mechanics – passed

1.3. Expected learning outcomes for the subject

1. Describe the behavior, select, analyze and draw basic geotechnical structures: shallow and deep foundation structures, retaining structures, slopes and embankments
2. Describe and analyze the behavior of rock mass in the environment of underground openings during construction and use.
3. Calculate the loads on the foundation structures and the limit values of the bearing capacity of the soil and rock mass
4. Calculate the stability of retaining structures, slopes and embankments
5. Apply appropriate regulations for the design and execution of geotechnical works
6. Describe and select appropriate equipment and design, describe and plan the process of building foundation and other geotechnical structures and underground openings.

1.4. Content of the course

Shallow foundation.
Deep foundation.
Supporting structures.
Gable structures.
Slope stability: causes of slippage and calculation methods.
Slope stability: landslide remediation methods.
Structures made of earth material.
Forms of instability of underground spaces.
Principles and techniques of stabilization of rock mass in the vicinity of underground spaces.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☒ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attending lectures and exercises. Creating a program task.

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce	0.25	Essay		Research	
Project	0.75	Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam.
The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Nonveiller, E.: Soil Mechanics and Foundation of Buildings, Školska knjiga, Zagreb, p.780, 1979.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Nonveiller, E.: Sliding and stabilization of slopes, Školska knjiga, Zagreb, p.204, 1987.
2. Hoek, E., Bray, J.W.: Rock Slope Engineering, 2nd. Edn., The Institute of Mining and Metallurgy, London, p. 527., 1977.
3. Hoek, E., Brown, E.T.: Underground Excavations in Rock, Istitution of Mining and Metallurgy, London, 1980.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Nonveiller, E.: Soil Mechanics and Building Foundations, Školska knjiga, Zagreb, p.780, 1979.	6	75

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Barbara Karleuša, Ph.D.	
Course	**Fundamentals of Hydraulic Engineering**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**30+30+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

To ensure that within the course students master the basic elements of engineering perception, reasoning and solving hydrotechnical tasks in the field of watercourse regulation, water supply and drainage systems.
To train students for the independent realization of elementary tasks in the field of watercourse regulation, water supply and wastewater and rainwater drainage.

1.2. Conditions for enrolment in courses

Hydromechanics – passed

1.3. Expected learning outcomes for the subject

1. Identify the principles of the functioning of ecosystems and its components, their vulnerability and the possibility of protection with a focus on water resources.
2. Calculate the basic elements of watercourse regulation and display them graphically.
3. Calculate the relevant input parameters for the dimensioning of water supply and drainage systems, carry out the dimensioning and graphically display the solution.
4. Explain the basic methods of drinking water conditioning and wastewater treatment.
5. Explain the types, elements and functioning of reservoirs, dams and hydromelioration systems.
6. Identify the basic impact of climate change on hydraulic structures and systems.

1.4. Content of the course

1. Ecosystem, water resources and systems (basic concepts, distribution of waters in the hydrosphere, water quality, water management systems and environment, structural and non-structural measures in water management)
2. Watercourse regulation (morphology of the riverbed, floods, sedimentation, longitudinal and transverse structures in the riverbed, basics of design, construction and maintenance of facilities)
3. Water supply systems (water needs, water conditioning, elements of water supply systems, basics of design, construction and maintenance of water supply systems)
4. Wastewater and rainwater drainage systems (relevant quantities, elements of the drainage system, wastewater treatment, recipient characteristics and protection of water from pollution, basics of design, construction and maintenance of drainage systems)
5. Dams and reservoirs (types, functions, parts)
6. Hydro-amelioration systems (irrigation and drainage of agricultural land)
7. Overview of the impact of climate change on hydraulic structures and systems

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%.
Satisfaction of activities that evaluate the acquisition of learning outcomes: attendance, program, periodic testing of knowledge and final exam.

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce		Essay		Research	
Project	1	Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam.
The total proportion of points that can be earned is 70% during classes and 30% in the final exam.
Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Gulić,I. (2000): Water Supply, HSGI, Zagreb.
2. Margeta, J. (2009): Sewerage of settlements: drainage and disposal of wastewater and rainwater, Faculty of Civil Engineering and Architecture in Split, Split.
3. Vuković, Ž. (1994): Basics of Hydraulic Engineering, Aquamarine, Zagreb.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Tedeschi, S. (1996): Water Protection, Croatian Society of Civil Engineers
2. Svetličić, E. (1987): Open Watercourses – Regulations, GF Zagreb.
3. Chin A.D.: 2000, Water – Resources Enginnering, Prentice Hall, New Jersey.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Gulić,I. (2000): Water Supply, HSGI, Zagreb.	20	75
Margeta, J. (2009): Sewerage of settlements: drainage and disposal of wastewater and rainwater, Faculty of Civil Engineering and Architecture in Split, Split.	10	
Vuković, Ž. (1994): Basics of Hydraulic Engineering, Aquamarine, Zagreb.	14	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Aleksandra Deluka-Tibljaš, Ph.D.; Assoc. Prof. Sanja Šurdonja, Ph.D.	
Course	**Fundamentals of Road Design 1**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	5.0
	Number of hours (L+E+S)	30+30+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

The aim of the course is for students to master the basics of calculating horizontal and vertical elements of roads and to know how to apply the basic elements of intersections at level.

1.2. Conditions for enrolment in courses

Geodesy – passed

1.3. Expected learning outcomes for the subject

1. Define, recognize and sketch the basic elements of the road, Describe the development of road construction throughout history and list the most important historical roads in the wider region.
2. Calculate the horizontal geometric elements of roads.
3. Calculate the vertical geometric elements of roads.
4. Describe the basic elements of different categories of urban roads.
5. Select appropriate geometric elements of the intersection in level (in simple traffic and spatial conditions).
6. To make a preliminary design of an open section of the road outside the settlement.- to set the horizontal and vertical course of the road route outside the settlement and to form three-way intersections at the level of the connections.

1.4. Content of the course

History of Road Construction and Categorization of Roads in the Republic of Croatia and the EU
Basic terms related to road traffic and roads, traffic load, cross-sectional elements.
Basic theories and features of vehicle movement.
Horizontal guidance of the road route, road plan elements.
Vertical guidance of the road route.
Basics of urban road design – categories, geometric elements.
Basics of designing a level hub – types, geometric elements.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Periodic examination of knowledge, creation of a program assignment, attendance and active participation in classes.

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce		Essay		Research	
Project	1.25	Continuous Knowledge Assessment	0.75	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Dragčević, V., Korlaet, Ž.: Road Design and Construction, University of Zagreb Faculty of Civil Engineering, Zagreb, 2018.
2. Legac, Ivan: Intersections of Public Roads, University of Zagreb, Faculty of Transport and Traffic Engineering, Zagreb, 2008.
3. Legac, Ivan: City Roads, University of Zagreb, Faculty of Transport and Traffic Engineering, Zagreb, 2011.
4. Ordinance on the basic conditions that public roads outside settlements and their elements must meet from the point of view of traffic safety, Official Gazette No. 110/01.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Dragčević, V., Korlaet, Ž.: Road Design and Construction, University of Zagreb Faculty of Civil Engineering, Zagreb, 2018.	3	80
Legac, Ivan: Intersections of Public Roads, University of Zagreb, Faculty of Transport and Traffic Engineering, Zagreb, 2008	3	
Legac, Ivan: City Roads, University of Zagreb, Faculty of Transport and Traffic Engineering, Zagreb, 2011.	20	
Ordinance on the basic conditions that public roads outside settlements and their elements must meet from the point of view of traffic safety, Official Gazette no. 110/01.	online	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Aleksandra Deluka-Tibljaš, Ph.D.; Marijana Cuculić, Ph.D., Senior Lecturer	
Course	**Fundamentals of Road Design 2**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**20+25+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

The aim of the course is to train students for the development of road projects in the form of optimization of earthworks and works on the lower structure of the road.

1.2. Conditions for enrolment in courses

Fundamentals of Road Design 1 – passed

1.3. Expected learning outcomes for the subject

1. Distinguish the method of road construction with regard to the base on which it is built
2. Elaborate the cross-sections of the out-of-town road with drainage elements
3. Calculate earthmoving volumes
4. Explain the basic influences and distinguish the application of different types of pavement materials
5. Dimensioning a flexible pavement structure using the empirical method

1.4. Content of the course

1. Lower structure of roads
2. Material classification and material quality rating
3. Methods for the manufacture of elements of the lower structure of the road
4. Basics of Dimensioning of Flexible Pavement Structures by Empirical Methods
5. Pavement Construction Materials
6. Basics of drainage of roads outside settlements

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Periodic examinations of knowledge, development of the program task of the road project outside the settlement, attendance and active participation in classes.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper		Experimental work	
Written exam	0.75	Viva voce		Essay		Research	
Project	1.25	Continuous Knowledge Assessment	0.5	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Dragčević, V., Korlaet, Ž.: Road Design and Construction, University of Zagreb Faculty of Civil Engineering, Zagreb, 2018.
2. Ordinance on the basic conditions that public roads outside settlements and their elements must meet from the point of view of traffic safety, Official Gazette
3. General technical conditions for road works
4. Babić, B.: Design of pavement structures, Zagreb 1997.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Lukić, D.Č.; Anagnosti, P.V.: Geotechnics of Roads, Belgrade 2010.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Dragčević, V., Korlaet, Ž.: Road Design and Construction, University of Zagreb Faculty of Civil Engineering, Zagreb, 2018.	3	75
Ordinance on the basic conditions that public roads outside settlements and their elements must meet from the point of view of traffic safety, Official Gazette	online	
General technical conditions for road works	23	
Babić, B.: Design of pavement structures, Zagreb 1997.	7	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Asst. Prof. Edita Papa Dukić, Ph.D.; Asst. Prof. Nina Čeh, Ph.D.	
Course	**Fundamentals of Statics**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	6.0
	Number of hours (L+E+S)	30+30+0

1. DESCRIPTION OF THE COURSE		
1.1. Course objectives		
Understand the laws of statics of rigid bodies under the action of a central and general system of forces in the plane and space. Be able to apply these laws in determining reactions and intersectional forces in simple line structures. Acquire the necessary prior knowledge for the courses Fundamentals of Dynamics and Mechanics of Solid Bodies 1.		
1.2. Conditions for enrolment in courses		
-		
1.3. Expected learning outcomes for the subject		
1. Explain the basic theorems and axioms in statics and the concept of force and momentum. 2. Determine the reactions and intersectional forces of simple structural systems and draw diagrams of internal forces. 3. Analyze geometric invariability and static definiteness or uncertainty of line structures.		
1.4. Content of the course		
Basic concepts of mechanics. Vectors and vector spaces. Central system of forces in plane and space. Equilibrium of the central system of forces; the equilibrium of the material particle. A general system of forces in plane and space. A moment of force. Parallel forces. Coupling forces. Reduction to moment of force and force with grip. Equilibrium of the general system of forces; the balance of a rigid body. Basic types of construction. Responses and reactions. Bars and forces in the bars of the bars. Beam supports. Uniform continuous load. Intersectional forces and their diagrams. Static definiteness and uncertainty. Beams and frames with joints. Diagrams of intersectional forces in beams and frames with joints. Connections between the intersectional forces and the maximum bending moment.		
1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☐ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70% and satisfaction of activities that evaluate the acquisition of learning outcomes (colloquia).

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	0.5
Written exam	2	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1.5	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Andrejev, V.: Mechanics - Part 1: Statics, Tehnička knjiga, Zagreb, 1968.
2. Damić, V.: Statics, Croatian University Press, Zagreb, 1999 (953-169-045 6)

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Beer, F.P, Johnston, E.R., Jr. Vector Mechanics for Engineers – Statics, McGraw-Hill, Singapore, 1990 (0-07-100454-8)
2. Pytel, A., Kiusalaas, J. Engineering Mechanics – Statics, Harper Collins, New York, 1996 (0-673-99870-3)
3. McLean, W.G, Nelson, E.W. Engineering Mechanics (Schaum's Outline Series), McGraw-Hill, New York, 1962 (07-044812-4)
4. Stanek, M, Turk, G. Statics I, University of Ljubljana, Faculty of Civil Engineering and Geodesy, Ljubljana, 1996 (961-6167-07-3)
5. Matejiček, F. Semenski, D, Vnučec, Z. Introduction to Statics with a Collection of Tasks, Golden Marketing – Tehnička knjiga, Zagreb, 2005 (953-6168-88-X)

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Andrejev, V.: Mechanics - Part 1: Statics, Tehnička knjiga, Zagreb, 1968.	2	100
Damić, V.: Statics, Croatian University Press, Zagreb, 1999 (953-169-045 6)	22	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Asst. Prof. Teo Mudrić Ph.D.	
Course	**Statics of Linear Structures 1**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**6.0**
	Number of hours (L+E+S)	**30+30+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

After completing the course, the student is expected to master the basic theoretical knowledge and practical methods of calculation of statically determined line structures of buildings loaded with static, stable and moving loads.

1.2. Conditions for enrolment in courses

Fundamentals of Statics – passed

1.3. Expected learning outcomes for the subject

1. Students will be able to distinguish between statically determined and statically indeterminate models according to the criterion of static determination on concrete practical examples.
2. Students will be able to prove the balance of forces in plane and space using analytical expressions and the principle of virtual work on all types of statically determined models composed of flat or curved rods.
3. Students will be able to determine the cross-sectional forces of rod systems based on equilibrium conditions on planar and spatial line models of structures.
4. Students will be able to describe the theoretical foundations of the relationships between cross-sectional forces and deformation quantities using equilibrium and constitutive equations and compatibility equations due to the action of longitudinal forces, bending moments, torsional moments and shear forces on line beams.
5. Students will be able to apply the methods and technique of deformation calculation, and analyze the significance of individual deformation quantities, assuming small deformations on statically determined models.
6. Students will be able to determine the influence line for an arbitrary static quantity by analytical and graphical means on a statically determined carrier.
7. Students will be able to describe the concepts of flexion and rigidity on an arbitrarily statically determined model.

1.4. Content of the course		
Types and structure of line constructive models. kinematic and static stability of the model. Equilibrium equations of stable models. The principle of virtual works as an expression of balance. Principles of load and influence superposition, symmetry and load asymmetry. Application of methods to the analysis of statically determined beam girders, frames, grills, gratings and complex forms. Analysis of model behavior by applying influence lines for moving actions. Application of displacement determination methods on line models of structures.		
1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%
Satisfy active exercises
Create an assigned standalone task
Pass written examinations during classes (colloquiums)
Pass the final exam

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	2.5	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1.5	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total number of points that can be obtained is 50% during classes and 50% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Simović. V.: Building Statics I, Civil Engineering Institute, Zagreb, 1988.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Werner, H.: Technical Mechanics, Faculty of Civil Engineering, Zagreb, 1986.
2. Tymoshenko, S.; Young, D.H.: Statics of Engineering Structures, Construction Book, Belgrade, 1956.
3. Đurić, M.: Statics of Structures, Construction Book, Belgrade, 1979.
4. Wagner, W.; Erlhof, G.: Practical Building Statics I, Construction Book, Belgrade, 1979.
5. Prokofiev, I. P.: Theory of Constructions I, Building Book, Belgrade, 1966.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Simović. V.: Building Statics I, Civil Engineering Institute, Zagreb, 1988.	4	80

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Dragan Ribarić, Ph.D.	
Course	**Statics of Linear Structures 2**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	5.0
	Number of hours (L+E+S)	30+30+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

After completing the course, the student is expected to master the basic theoretical knowledge and practical methods of calculation of statically indeterminate line structures of buildings loaded with static loads.

1.2. Conditions for enrolment in courses

Statics of Linear Structures 1 - passed

1.3. Expected learning outcomes for the subject

1. Determine the degree of static uncertainty on more complex structures.
2. Apply the displacement method and the force method for the calculation of statically indeterminate structures.
3. Apply procedures for determining displacements and turns to statically indeterminate structures.
4. Apply computational methods and computer programs to the design of structures.

1.4. Content of the course

1. Determination of the uncertainty of line models of structures.
2. Force Method in Model Static Uncertainty Analysis and Choice of "Basic Model".
3. Continuity equations. Formation of the flexibility matrix of the model.
4. The impact of forced displacements. The influence of temperature.
5. Apply the method to different types of constructive models.
6. Geometrically symmetrical models.
7. A reduction rule for calculating deformations of indeterminate models and applications to "base models" that are still statically indeterminate.
8. The method of deformation in the analysis of both statically determined and indeterminate line models.
9. Rod stiffness matrix and structural model stiffness matrix.
10. Forces and moments of tension for local load.
11. Movable and Stationary Constructive Models.
12. Simplified "engineering" method of displacement.
13. Application of the displacement method to computer programs for modeling line structures.

1.5. Types of teaching

☒ lectures	☒ Independent tasks
☐ seminars and workshops	☒ Multimedia & Network
☒ exercises	☐ laboratory
☒ Distance education	☒ Mentoring work
☐ Field Teaching	☐ Other_____

1.6. Comments	

1.7. Obligations of students

Students are obliged to attend lectures and exercises in at least 70% of the timetable, participate in solving tasks in active exercises, meet two written exams during classes (colloquiums), create an independent assignment - program (an alternative option instead of assignments from active exercises) and meet the written final/remedial exam. Independent research is an option for creating a program.

1.8. Monitoring student work

Attending classes	2	Teaching activity	0.5	Seminar paper		Experimental work	
Written exam	1.5	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Anđelić, M., Statics of Indeterminate Rod Structures, DHGK, Zagreb 1993.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Ghali, A.M. Neville and T.G. Brown, Structural analysis. A Unified Classical and Matrix Approach, Spon Press, London and New York, 2003.
2. S. Tymoshenko, D.H. Young, Theory of Structures, Construction Book, Belgrade, 1968.
3. S.P. Timoshenko, D.H. Young, Ttheory of structures, McGraw-Hill International Editions, 1965.
4. Livesley, R.K.: Matrix Methods of Structural Analysis, 1975.
5. I.P. Prokofiev, Theory of Structures II, Building Book, Belgrade, 1960
6. Wagner, W.; Erlhof, G., Practical Building Statics III, 1981.
7. Đurić, M.: Statics of Structures, 1979.
8. K. Beyer, Statics of Reinforced Concrete Structures, Stavebna knjiga, Belgrade, 1963.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
1. Anđelić, M., Statics of Indeterminate Rod Structures, DHGK, Zagreb 1993.	2	75

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Diana Car-Pušić Ph.D.	
Course	**Professional Practice 1**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	3.0
	Number of hours (L+E+S)	0+0+90

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Introduction to the practical application of organizational and technological knowledge through solving specific tasks in the business environment (with the investor/designer/supervising engineer/contractor).

1.2. Conditions for enrolment in courses

Construction Technology – passed
Construction Organization – *enrolled*

1.3. Expected learning outcomes for the subject

- Solve the tasks/problems of construction project preparation using procedures/methods from the organization, technology and economics of construction
- Apply the acquired knowledge from other professional courses to solve specific problems in the business environment of a construction project
- Solve an organizational and technological task for a specific project
- Present in writing and orally explain the selected organizational and technological solution
- Keep a work diary (study)

1.4. Content of the course

Performing professional practice within a construction company.

1.5. Types of teaching	☐ lectures ☐ seminars and workshops ☐ exercises ☐ Distance education ☒ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☒ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Min. 2 weeks (80 h) of professional practice within the construction company (with the investor/designer/supervising engineer/contractor), preparation of the professional practice study, exam.

1.8. Monitoring student work

Attending classes		Teaching activity		Seminar paper		Experimental work	
Written exam	0.5	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	2.5
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Preparation and submission of professional practice studies, exam – 100%.
According to the current Ordinance on Studies of the University of Rijeka and the Ordinance on Evaluation and Evaluation of Work
students at the Faculty of Civil Engineering of the University of Rijeka.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Materials on LMS Merlin

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Bučar, G.: Carpentry, Reinforcement and Concrete Works on the Construction Site, Faculty of Civil Engineering J.J. Strossmayer, Osijek, 1997.
2. Linarić, Z.: Lexicon of Machinery and Equipment for the Production of Building Materials - Effects of Machinery and Vehicles in Earthworks, Business Media Croatia, Zagreb, 2007.
3. Lončarić, R.: Organization of Construction Projects, HDGI, Zagreb, 1995.
4. Mlinarić, V.; Construction Technology, Croatian University Press, Zagreb University of Applied Sciences, Zagreb, 2017
5. Radujković, M. et al.: Organization of Construction, University of Zagreb, Faculty of Civil Engineering, Zagreb, 2015.
6. Radujković, M. et al.: Project Planning and Control, University of Zagreb, Faculty of Civil Engineering, Zagreb, 2012.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Materials on LMS Merlin	online	75

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Diana Car-Pušić, Ph.D.	
Course	**Professional Practice 2**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	3.0
	Number of hours (L+E+S)	0+0+90

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Introduction to the practical application of organizational and technological knowledge through solving specific tasks on the construction site.

1.2. Conditions for enrolment in courses

Construction Technology – passed
Construction Organization – *enrolled*
Professional Practice 1 – *enrolled*

1.3. Expected learning outcomes for the subject

- Solve tasks/problems of construction preparation and construction by means of procedures/methods from the organization, technology and economics of construction
- Apply the acquired knowledge from other professional courses to solve specific problems on the construction site
- Solve an organizational and technological task for a specific construction site
- Present in writing and orally explain the selected organizational and technological solution
- Keep a construction diary (study)

1.4. Content of the course

Doing a short internship on the construction site.

1.5. Types of teaching	☐ lectures ☐ seminars and workshops ☐ exercises ☐ Distance education ☒ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☒ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Min. 2 weeks (80) hours of professional practice on the construction site of a civil engineering or building construction facility, preparation of a professional practice study, exam.

1.8. Monitoring student work

Attending classes		Teaching activity		Seminar paper		Experimental work	
Written exam	0.5	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	2.5
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Preparation and submission of professional practice studies, exam – 100%.
According to the current Ordinance on Studies of the University of Rijeka and the Ordinance on Evaluation and Evaluation of Work
students at the Faculty of Civil Engineering of the University of Rijeka.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Materials on LMS Merlin

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Bučar, G.: Carpentry, Reinforcement and Concrete Works on the Construction Site, Faculty of Civil Engineering J.J. Strossmayer, Osijek, 1997.
2. Linarić, Z.: Lexicon of Machinery and Equipment for the Production of Building Materials - Effects of Machinery and Vehicles in Earthworks, Business Media Croatia, Zagreb, 2007.
3. Lončarić, R.: Organization of Construction Projects, HDGI, Zagreb, 1995.
4. Mlinarić, V.; Construction Technology, Croatian University Press, Zagreb University of Applied Sciences, Zagreb, 2017
5. Radujković, M. et al.: Organization of Construction, University of Zagreb, Faculty of Civil Engineering, Zagreb, 2015.
6. Radujković, M. et al.: Project Planning and Control, University of Zagreb, Faculty of Civil Engineering, Zagreb, 2012.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Materials on LMS Merlin	online	75

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Silvija Mrakovčić, Ph.D.	
Course	**Concrete and Asphalt Technology**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	3.0
	Number of hours (L+E+S)	15+15+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

To introduce students to the technological aspects of asphalt and concrete mixtures.

1.2. Conditions for enrolment in courses

Engineering Materials - passed

1.3. Expected learning outcomes for the subject

1. Apply the acquired knowledge about the properties of ingredients, technology and properties of asphalt and concrete mixtures to solve given problems.
2. Design a composition of asphalt and concrete mixtures of given workability, strength and durability.
3. Plan the preparation and implementation of tests of asphalt and concrete according to the standard written in English.
4. Examine the basic properties of asphalt and concrete in a fresh and hardened state.

1.4. Content of the course

Physical, mechanical and technological properties of ingredients for asphalt and concrete mixtures.
Properties, production, application and testing of properties of asphalt and concrete mixtures.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☒ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Students are required to attend lectures regularly, pass a colloquium, actively participate in field classes, actively participate in laboratory exercises.

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper		Experimental work	1
Written exam		Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Preparation of the plan and implementation of the experiment, attendance at classes, colloquium – 100%.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Bjegović, D., Štirmer, N.: Theory and Technology of Concrete, Zagreb, 2015.
2. Bjegović D., Balabanić G., Mikulić D.: Building Materials – A Collection of Solved Problems, Zagreb, 2007.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Muravlov M.: Fundamentals of Concrete Theory and Technology, Construction Book, Belgrade, 2005.
2. Mehta P K., Paulo J M. Monteiro: Concrete, Microstructure, Properties and Materials, McGraw Hill 2006.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Bjegović, D., Štirmer, N.: Theory and Technology of Concrete, Zagreb, 2015.	20	80
Bjegović D., Balabanić G., Mikulić D.: Building Materials – A Collection of Solved Problems, Zagreb, 2007.	22	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Diana Car-Pušić, Ph.D.	
Course	**Construction Technology**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	3.0
	Number of hours (L+E+S)	20+10+0

1. DESCRIPTION OF THE COURSE		
1.1. Course objectives		
Acquisition of technological knowledge and skills necessary for preparation and construction.		
1.2. Conditions for enrolment in courses		
-		
1.3. Expected learning outcomes for the subject		
1. Interpret the basic concepts of construction technology. 2. Elaborate in writing and orally the technological problem of construction using appropriate terminology. 3. Solve a construction technology task in the preparation of construction (e.g. planning of technological resources needed for construction). 4. Develop a construction technology project for a medium-complex building (civil engineering or high-rise construction).		
1.4. Content of the course		
1. Introduction to Construction Technology 2. Designing construction technology 3. Calculation of the effects of standard construction machinery 4. Technological solutions for standard construction processes 5. Dimensioning of technological resources required for construction		
1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		
1.7. Obligations of students		
Attendance at lectures and exercises according to the applicable Regulations.		

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 70% during classes and 30% in the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Mlinarić, V., Construction Technology, Croatian University Fee, Zagreb University Polytechnic, Zagreb, 2017.
2. Bučar, G., Normatives of Construction Works – Handbook for Construction Entrepreneurship, ICG, Omišalj, Rijeka, 1999.
3. Linarić, Z., Lexicon of Machinery and Equipment for the Production of Building Materials,. Business Media Croatia, Zagreb, 2007.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Bučar G., Carpentry, Reinforcement and Concrete Works on the Construction Site, Faculty of Civil Engineering J.J. Strossmayer, Osijek, 1997.
2. Trbojević, B., Construction Machinery, Belgrade, 1985.
3. Trbojević, B., Organization of Construction Works, Scientific Book, Belgrade, 1992.
4. Linarić, Z., Plants for the production of bulk and related mineral materials. Business Media Croatia, Zagreb, 2009.
5. Radujković, M. et al., Organization of Construction, Textbooks of the University of Zagreb, Zagreb, 2015.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Mlinarić, V., Construction Technology, Croatian University Fee, Zagreb University Polytechnic, Zagreb, 2017.	15	80
Bučar, G., Normatives of Construction Works – Handbook for Construction Entrepreneurship, ICG, Omišalj, Rijeka, 1999.	13	
Linarić, Z., Lexicon of Machinery and Equipment for the Production of Building Materials,. Business Media Croatia, Zagreb, 2007.	5	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Silvija Mrakovčić, Ph.D.	
Course	**Introduction to Civil Engineering**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**3.0**
	Number of hours (L+E+S)	**20+0+10**

1. DESCRIPTION OF THE COURSE		
1.1. Course objectives		
To introduce students to the basic concepts related to civil engineering, materials, elements and types of buildings and the achievements of world, Croatian and local construction.		
1.2. Conditions for enrolment in courses		
-		
1.3. Expected learning outcomes for the subject		
1. Distinguish and compare the basic phases in the historical development of construction. 2. Distinguish between the basic types, materials and elements of buildings. 3. Explain the specifics of certain types of buildings. 4. Explain the importance of applying regulations and standards in construction. 5. Write and present a seminar paper on the topic of features of an existing building in Croatia.		
1.4. Content of the course		
History of Construction Types of building materials and load-bearing elements Construction methods Geotechnical structures Hydrotechnical structures Transport infrastructure Buildings Regulations and Standards in Construction Special achievements in world and Croatian construction; Modern materials and constructions Field tours		
1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☐ exercises ☐ Distance education ☒ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance 70%
Satisfaction of activities that evaluate the acquisition of learning outcomes: class activity, colloquium, seminar, field work.

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper	1	Experimental work	
Written exam		Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 100% during classes. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

Radić, J. Introduction to Construction, Školska knjiga, 2016.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Radić, J. Introduction to Construction, Školska knjiga, 2016.	2	100

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Adriana Bjelanović, Ph.D.; Prof. Ivana Štimac Grandić, Ph.D.	
Course	**Introduction to the Design of Civil Engineering Structures**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**3.0**
	Number of hours (L+E+S)	**20+10+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Acquiring basic knowledge about the design of building structures, the legislative, technical and standardization framework that regulates it, taking into account the specifics of the material, the type and load-bearing system of the structure and the effects on the structure.

1.2. Conditions for enrolment in courses

Building Elements - passed
Statics of Linear Structures 1 - *enrolled*

1.3. Expected learning outcomes for the subject

1. Distinguish the typological characteristics of building structures and interpret the function of their elements and parts.
2. Distinguish the basic layout solutions of building structures.
3. Distinguish between basic physical and mechanical properties and types of basic building materials in the design and typology of structures.
4. Identify key factors for determining basic actions on structures and distinguish between budget situations and combinations of actions.

1.4. Content of the course

Planar and spatial structural systems, layouts and elements of building structures.
Specifics of building design with regard to the structural system, material and essential requirements for buildings.
Legislative framework (technical and legal framework) and Eurocode design system.
Materials and products.
Actions on structures.
Boundary balances and budgetary situations.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%
Satisfaction of activities that evaluate the acquisition of learning outcomes (development and defense of independent tasks)

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	
Portfolio		Independent tasks	1				

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and grading is carried out during classes 60% and 40% of points during the exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Markulak, D., Zovkić, J., Kraus, I.: Building Structures in Buildings, Josip Juraj Strossmayer University of Osijek, Faculty of Civil Engineering and Architecture Osijek, Osijek, 2021.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Podhorsky, I.: Load-bearing structures, Golden Marketing – Technical Book and Faculty of Architecture, University of Zagreb, Zagreb, 2003.
2. Sulyok-Selimbegović, M.: Steel Structures, Golden Marketing and Faculty of Architecture, University of Zagreb, Zagreb, 2003.
3. Salvadori, M.: Load-bearing Structures in Architecture, UPI-2M, Zagreb, 1995.
4. Ching, F. D. K.: Building Construction Illustrated, Wiley, 2020.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Markulak, D., Zovkić, J., Kraus, I.: Building Structures in Buildings, Josip Juraj Strossmayer University of Osijek, Faculty of Civil Engineering and Architecture Osijek, Osijek, 2021.	10	80

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Boris Podobnik, Ph.D.	
Course	**Probability and Statistics**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	4.0
	Number of hours (L+E+S)	30+15+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Students will get to know:
- basic rules of probability calculus,
- the most important random variables (in which experiments they occur and what mathematical properties they have),
- numerical quantities that are calculated in descriptive statistics,
- Basic procedures of inductive statistics: finding confidence intervals and testing parametric hypotheses.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

After passing the course exam, students will be able to:
1. explain concepts such as event, probability of an event, random variable, probability distribution, mathematical expectation and variance,
2. apply basic probability calculation procedures,
3. recognize the Markov chain and determine the transition matrix,
4. argumentatively apply the most common probability distributions,
5. descriptively and statistically process the collected data, and present and interpret them,
6. apply basic techniques of inferential statistics (interval assessments, tests).

1.4. Content of the course

Probability of the event. Conditional probability. Markov chains. Discrete random variables. Continuous random variables. Boundary theorems. Descriptive statistics. Point and interval parameter evaluations. Statistical tests.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70% of classes. Passing the point threshold for both tests: the colloquium and the final exam.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper		Experimental work	
Written exam	1.25	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1.25	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. During classes, it is possible to earn a maximum of 70 points. A maximum of 30 points can be earned on the final exam. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Elezović, N.: Probability and Statistics, 1st edition, Element, Zagreb, 2018.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Vranić, V.: Probability and Statistics, 3rd edition, Tehnička knjiga, Zagreb, 1971.
2. Pauše, Ž.: Introduction to Mathematical Statistics, Školska knjiga, Zagreb, 1993.
3. Bernstein, S.; Bernstein, R.: Elements of Statistics I: Descriptive Statistics and Probability, Schaum's Series, McGraw-Hill, New York, 1999.
4. Bernstein, S.; Bernstein, R.: Elements of Statistics II: Inferential Statistics, Schaum's Series, McGraw-Hill, New York, 1999.
5. Johnson, R.A.; Bhattacharyya, G.K.: Statistics: Principles and Methods, Wiley, New York, 5th edition, 2006.
6. Kreyszig, E.: Advanced Engineering Mathematics, Wiley, New York, 9th edition, 2006.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Elezović, N.: Probability and Statistics, 1st edition, Element, Zagreb, 2018.	2	80

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	mentor	
Course	**Undergraduate Thesis**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Mandatory	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**0+0+150**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

A successful completion of the final thesis exam is proof that the student is able to independently create and present a large-scale seminar paper or a professional project (conceptual solution or solution to a theoretical or practical problem in civil engineering) related to the planning or design of a certain less complex building structure or system.

1.2. Conditions for enrolment in courses

Achieved 120 ECTS credits.

1.3. Expected learning outcomes for the subject

1. Define a professional problem.
2. Design and independently conduct research.
3. Solve a practical problem/task independently.
4. Apply the acquired knowledge and general competencies acquired through the study.
5. Apply the acquired knowledge and specific competencies in the relevant subject.
6. Apply the methodology of writing a professional and scientific work.
7. Make a presentation of the results of the conducted research using multimedia tools.
8. Use presentation skills in interpreting research results.

1.4. Content of the course

The final thesis is prepared by the student during the planned 150 hours of work (5 ECTS credits).
The final thesis can be written by the student on a practical or theoretical topic related to construction and similar in content to existing subjects.
The final thesis can take the form of:

- conceptual design of a simpler building (a bridge of a smaller span, an out-of-town road, a simpler drainage or water supply system or similar),
- a project for the organization of the construction of a simpler facility,
- static calculation of a building made of concrete, metal or wood,
- analytical or numerical treatment of a problem in the construction profession that requires additional theoretical processing.

In the preparation of the final thesis, the student actively cooperates with the teacher-mentor, as a rule, it is the teacher of the subject whose content is related to the selected topic. A teacher-commentator can also participate in the preparation of the final work if the content of the work requires it.

1.5. Types of teaching	☐ lectures ☐ seminars and workshops ☐ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☒ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Preparation and defense of the final thesis according to the defined topic and task of the work, and the instructions of the mentor (and commentator).

1.8. Monitoring student work

Attending classes		Teaching activity		Seminar paper	0 - 4	Experimental work	0 - 4
Written exam		Viva voce	1	Essay		Research	
Project	0 - 4	Continuous Knowledge Assessment		Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Preparation of the final paper.
Oral presentation of the work and oral answers to questions in front of the committee.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

Depending on the topic.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

Depending on the topic.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Vedran Jagodnik, Ph.D.	
Course	**Experimental Soil Mechanics**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**15+15+30**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Familiarity with standards related to the conduct of laboratory experiments; Introduction to the devices necessary for conducting laboratory experiments on fine-grained and coarse-grained materials; Independent planning and implementation of basic laboratory experiments.

1.2. Conditions for enrolment in courses

Soil and Rock Mechanics – passed

1.3. Expected learning outcomes for the subject

1. Distinguish between types of laboratory tests.
2. Ability to conduct experiments: specific density, mechanical sieving, sedimentation, plasticity limit.
3. Ability to conduct experiments: yield strength, compaction, consolidation, shear.
4. Understanding topics: specific density, mechanical sieving, sedimentation, consistency limit.
5. Understanding the topics: compaction, consolidation, shear.

1.4. Content of the course

Soil classification. Mechanical and Hydrometric Method of Determining Granulometry
Specific density, compaction, humidity. Determination by laboratory experiments
Yield, plasticity, shrinkage limits. Swelling.
Compressibility parameters. Compressibility test in an oedometer.
Determination of soil strength parameters in the laboratory.
Testing the strength of the soil in the direct shear device.
Preparation of laboratory studies (reports).
Introduction to advanced soil mechanics.

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at classes and laboratory exercises, preparation of reports.

1.8. Monitoring student work

Attending classes	2	Teaching activity	0.5	Seminar paper		Experimental work	0.5
Written exam	1	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Attendance at lectures and exercises.
Solving prepared tasks individually and in a team.
Discussing solutions.
Discussion on a given topic (oral presentation and argumentation).
Preparation and presentation of the seminar paper.
Two written and one oral examination of acquired competencies (colloquia).

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. R.D. Holtz, W.D. Kovacs, T.C. Sheahan,An Introduction to Geotechnical Engineering,Pearson, New York, 2011.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

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1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
R.D. Holtz, W.D. Kovacs, T.C. Sheahan,An Introduction to Geotechnical Engineering,Pearson, New York, 2011.	3	25

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Saša Čohar Mančić, Senior Lecturer	
Course	**English Language**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**3.0**
	Number of hours (L+E+S)	**10+15+5**

1. DESCRIPTION OF THE COURSE		
1.1. Course objectives		
Training students to use English in spoken form in everyday communication and in spoken and written form as a profession.		
1.2. Conditions for enrolment in courses		
-		
1.3. Expected learning outcomes for the subject		
1. Define basic vocabulary terms from a specific area of construction. 2. Define specific vocabulary terminology from certain areas. 3. Successfully use the acquired vocabulary and grammatical structures. 4. Apply the acquired knowledge in everyday communication and in communication in the function of the profession. 5. Successfully solve tasks related to the acquired vocabulary and grammatical structures. 6. Present the topic of the assigned seminar paper orally and in writing.		
1.4. Content of the course		
Lexical topics (general lexicon and professional and professional terminology): - fields of work, building materials, ancient structures, transport, environmental protection, bridges, tunnels, airports, hydrotechnical structures, important architects - phrases and idioms that are used in everyday communication, and their root is a term whose basic meaning refers to a building. **Grammatical topics** (general grammatical laws of the English language, specific grammatical structures inherent in the professional language: - formation-morphological level (types of words, morphological changes, word formation) - syntactic level (types of sentences, sentence parts, order of sentence components; use and arrangement of verb tenses; active-passive relationship).		
1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☒ exercises ☒ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at classes in accordance with the Study Regulations.
One written and one oral colloquium and a presentation on a given topic. The points achieved in the activities are added up (written 50%, oral 30%, presentation 20% of points). The condition for passing the course and entering the grade and ECTS credits is a total of 50% of the points achieved.

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper	0.4	Experimental work	
Written exam		Viva voce	0.6	Essay		Research	
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

The written colloquium contains tasks of an objective type.
At the oral colloquium, the acquired competence of speech expression is evaluated (20% vocabulary, 50% free retelling of content, 30% oral translation)
The presentation evaluates linguistic expression on a given topic and the acquisition of grammatical and lexical content (50% + 50%).

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Kralj Štih, A.: English in Civil Engineering, Hrvatska sveučilišna naklada, Zagreb, 2004.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Thomson, A.J., Martinet, A. V.: A Practical English Grammar, Exercises 1, Oxford University Press, Oxford, 1986.
2. Thomson, A.J., Martinet, A. V.: A Practical English Grammar, Exercises 2, Oxford University Press, Oxford, 1986.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Kralj Štih, A.: English in Civil Engineering, Hrvatska sveučilišna naklada, Zagreb, 2004.	5	100

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Aleksandra Deluka-Tibljaš, Ph.D.; Assoc. Prof. Sanja Šurdonja, Ph.D.	
Course	**Urban Roads and Intersections**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**30+30+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

The aim of the course is for students to master the basics of designing traffic infrastructure in urban conditions (city roads, intersections and parking spaces) taking into account the satisfaction of functional requirements – traffic safety, capacity and overall sustainability of urban traffic.

1.2. Conditions for enrolment in courses

Fundamentals of Road Design 1 - passed

1.3. Expected learning outcomes for the subject

1. Explain the basic impacts on urban traffic and the requirements to be met by transport infrastructure in urban areas
2. Define and explain the characteristics of individual categories of roads in cities
3. Explain the elements and application of different types of intersections
4. Define the basic characteristics and design conditions for non-motorized modes of traffic in cities
5. Conduct a simple traffic survey
6. Develop a project solution for a city intersection under the given conditions
7. Design a smaller parking lot

1.4. Content of the course

Specifics of traffic flow in cities, the impact of traffic on the city
Basic traffic research
Sustainable urban transport
City roads – planning – function, categorization, characteristics
Urban roads – project elements
City intersections – types and applications
City intersections – basics of designing intersections in level (standard, circular)
Non-motorized transport in cities – systems and method of planning and design
Parking – planning and designing parking in cities

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Periodic examination of knowledge, creation of a program assignment, attendance and active participation in classes.

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	0.75	Viva voce		Essay		Research	
Project	1.25	Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Preparation of a design solution for a city intersection, development of a design solution for an off-street parking lot.
Periodic examination of knowledge.
Final knowledge test.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Legac, Ivan: Intersections of Public Roads, University of Zagreb, Faculty of Transport and Traffic Engineering, Zagreb, 2008.
2. Legac, Ivan: City Roads, University of Zagreb, Faculty of Transport and Traffic Engineering, Zagreb, 2011.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Maletin, M.: Planning and Design of Roads in Cities, OrionArt, Belgrade, 2005.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Legac, Ivan: Intersections of Public Roads, University of Zagreb, Faculty of Transport and Traffic Engineering, Zagreb, 2008	3	25
Legac, Ivan: City Roads, University of Zagreb, Faculty of Transport and Traffic Engineering, Zagreb, 2011.	20	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Vanja Travaš, Ph.D.	
Course	**Hydrotechnical Measures for Adaptation to Climate Change**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**30+0+15**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

To ensure that students acquire basic knowledge about the impact of climate change on water resources, hydrotechnical structures and systems and about available hydrotechnical measures for adaptation to climate change.

1.2. Conditions for enrolment in courses

Hydrology – passed

1.3. Expected learning outcomes for the subject

1. Identify and explain the impact of climate change on water resources, hydrotechnical structures and systems.
2. Define hydrotechnical measures for adaptation to climate change.
3. Implement a climate change adaptation strategy.

1.4. Content of the course

Introduction. Water resources. Water systems (natural and artificial). Traces of climate change (overview of cartographic databases of relevant and available satellite programs). The impact of climate change on freshwater quantities and quality (with an emphasis on coastal water supplies). The impact of climate change on protection against the harmful effects of water (with an emphasis on flood protection in coastal areas). Temporal and spatial distribution of water (accumulation and retention of water). Climate Change Adaptation Strategy. Urban water systems from the perspective of climate change (management, monitoring, modeling, optimization, adaptation, construction and maintenance of systems). An approach to blue-green infrastructure planning. Drafting spatial planning regulations in the context of climate change.

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☐ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Regular attendance and active participation in classes.
Independent development, presentation and defense of the seminar paper.
Attendance at the oral colloquium.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper	1.5	Experimental work	
Written exam		Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

The student's work will be evaluated and evaluated 100% during the class (the activities marked in the previous table are evaluated). A detailed elaboration of the methods of monitoring and evaluating the work of students will be presented in the curriculum.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Climate Change Adaptation Strategy in the Republic of Croatia for the period until 2040 with a view to 2070, Official Gazette 46/2022.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Harber R.J.: Planning and Managing Reliable Urban Water Systems, 1997.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Climate Change Adaptation Strategy in the Republic of Croatia for the period until 2040 with a view to 2070, Official Gazette 46/2022.	online	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	External Lecturer	
Course	**Communication Skills**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**3.0**
	Number of hours (L+E+S)	**15+15+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

The aim of the course is for students to acquire knowledge about communication, its verbal and non-verbal aspects, and to develop the skills of effective oral and written communication through exercises.

1.2. Conditions for enrolment in courses

-

1.3. Expected learning outcomes for the subject

1. Explain the key elements in the communication process
2. Distinguish between types and styles of communication
3. Develop forms of (business) written expression
4. Conduct a public appearance

1.4. Content of the course

1. Successful Communication: Components and Process of Communication. Types of communication. Obstacles to successful communication. Cultural influences on communication.
2. Verbal communication: Language. Meaning. Clarity of expression. Formality of language.
3. Nonverbal communication: Types of nonverbal communication. Functions. Non-verbal expressiveness and sensitivity. Discrepancy between verbal and non-verbal communication. Self-presentation.
4. Communication skills:
   - Listening. The importance of listening. Listening components. Active listening techniques.
   - Conflict and negotiation. Types of conflicts. Causes of conflict. Consequences of the conflict. Conflict resolution.
   - Communication styles. Assertiveness. What is assertiveness? Causes of non-assertiveness. Specific assertive behavior techniques.
   - Communication at work: Interview. Communication in the organization. Communication climate. Communication in the team. Management. Public communication.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%
Satisfaction of activities that evaluate the acquisition of learning outcomes: preparation and defense of exercises, public speaking and final exam.

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper		Experimental work	
Written exam	0.5	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	
Portfolio	1	Public Speaking	0.5				

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam. The total proportion of points that can be earned is 100% during classes. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Matijaš, M., The Art of Public Speaking, A Complete Guide to Improving Communication Skills and Public Speaking, Creation, Banjole 2019.
2. Matijaš, M., Small Language Advisor for Better Business Communication, Creation, Banjole 2017.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
		25

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Saša Čohar Mančić, Senior Lecturer	
Course	**Building and Constructing English**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**3.0**
	Number of hours (L+E+S)	**15+10+5**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Training students for advanced use of English in spoken form in everyday communication and spoken and written form in the function of the profession.

1.2. Conditions for enrolment in courses

-

1.3. Expected learning outcomes for the subject

1. Define advanced vocabulary terms from a specific area of construction.
2. Define specific vocabulary terminology from certain areas.
3. Successfully use the acquired vocabulary and grammatical structures.
4. Apply the acquired knowledge in everyday communication and in communication in the function of the profession.
5. Present the topic of the assigned seminar paper orally and in writing.

1.4. Content of the course

Lexical topics (general lexicon and professional and professional terminology; important architects
- phrases and idioms that are used in everyday communication, and their root is a term whose basic meaning refers to a building.

Grammatical topics (specific grammatical structures inherent in general and professional language:
- proper use of acquired competences in written and spoken form).

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☒ exercises ☒ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at classes in accordance with the Study Regulations.
One written and one oral colloquium, an activity in class and a presentation on a given topic. Points achieved in activities are added up (written 30%, oral 10%, presentation 20% of points, activity in class 15% + 25%). The condition for passing the course and entering the grade and ECTS credits is a total of 50% of the points achieved.

1.8. Monitoring student work

Attending classes	1	Teaching activity	0.8	Seminar paper	0.4	Experimental work	
Written exam	0.6	Viva voce	0.2	Essay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

The written colloquium contains tasks of an objective type.
At the oral colloquium, the acquired competence of verbal expression on a given topic is evaluated.
The presentation evaluates linguistic expression on a given topic, the acquisition of grammatical and lexical content, and conducting a debate (10% + 5% + 5%).
Activity in class is evaluated by creating a quiz on a given topic (15%) and active participation in discussions (25%)

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Watcy-Jones, P.: Test Your Idioms, Pearson, Edinburgh, 2022.
2. Morris S., Stanton, A.: Test Yourself for First Certificate, Nelson House, Edingurgh, 1989.
3. Vince, M.: Advanced Language Practice, Macmillan Heinemann, Oxford, 2001.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
		25

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Ivan Marović, Ph.D.	
Course	**Construction Management**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**30+0+15**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

By mastering the broader conceptual knowledge necessary for modern management of construction companies. Recognizing and acknowledging business risk, its dimensioning and management. Training for making business decisions in conditions of risk and uncertainty.

1.2. Conditions for enrolment in courses

Civil Engineering Regulations - passed

1.3. Expected learning outcomes for the subject

1. Interpret the basic concepts of management and management in construction.
2. Compare the differences between strategic, tactical and operational management.
3. Apply learned models and decision-making procedures appropriately to the given decision-making conditions.
4. Recognize messages conveyed through both verbal and non-verbal communication.
5. Use different elements of financial and non-financial motivation.
6. Recognize organizational culture.
7. Recognize the importance of ethical business and business communication.
8. Recognize the stages of managing an organization on a practical example.

1.4. Content of the course

General management settings. Modern construction business company, its structure and functioning. Current and development business goals. Business policy as a means of achieving business goals and its methods. Decision theory, content, elements and criteria. Models, methods and procedures of modern business decision-making. Taking into account risk as an element and limitation in business decision-making and management of the overall construction business. Basics of business communication and methods of verbal and non-verbal communication.
Combining and targeting the business functions of a modern construction company.

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☐ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Students are required to attend lectures regularly, pass a colloquium, create and present a seminar paper.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper	1	Experimental work	
Written exam		Viva voce		Essay		Research	0.5
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Preparation and presentation of a seminar paper, attendance at classes, colloquium – 100%.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Buble, M. et al.: Strategic Management, Sinergija, Zagreb, 2005.
2. Medanić, B.: Management in Civil Engineering, Josip Juraj Strossmayer University, Faculty of Civil Engineering, Osijek, 1997.
3. Sikavica, P. et al.: Business Decision-Making, Školska knjiga, Zagreb, 2014.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Bovee, C.L., Thill, J.V.: Contemporary Business Communication, Mate, 2012.
2. Drucker, P.: The Most Important Thing About Management, MEP Consult, Zagreb, 2005.
3. Heller R.: Handbook for Managers, Profil, Zagreb, 2007.
4. Kelly, J., Male, S., Graham, D.: Value Management of Construction Projects, Blackwell Publishing, Oxford, 2004.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Buble, M. et al.: Strategic Management, Sinergija, Zagreb, 2005.	1	
Medanić, B.: Management in Civil Engineering, Josip Juraj Strossmayer University, Faculty of Civil Engineering, Osijek, 1997.	9	
Sikavica, P. et al.: Business Decision-Making, Školska knjiga, Zagreb, 2014.	1	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Ivana Štimac Grandić, Ph.D.	
Course	**Bridges**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**30+15+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Acquiring basic knowledge about the design and construction of bridges.

1.2. Conditions for enrolment in courses

Introduction to the Design of Civil Engineering Structures - passed
Solid Body Mechanics 1 - passed
Solid Body Mechanics 2 - passed
Statics of Linear Structures 2 - *enrolled*

1.3. Expected learning outcomes for the subject

1. Define the basic parts of a bridge and describe the elements of bridge design.
2. Define structural systems of bridges and list the advantages and disadvantages of each structural system.
3. Describe traffic conditions and determine the minimum free profiles on and under the bridge (depending on the type of bridge and its position in the area)
4. Enumerate the equipment of the bridge, define the basic features of each piece of equipment, sketch the elements of the equipment.
5. Define, differentiate and determine loads and actions on bridges depending on the type of bridge and its position in space.
6. Describe and distinguish the basic ways of building bridges.
7. Draw the longitudinal and transverse layout of the bridge, the view and the floor plan of the bridge based on the given parameters, combining the knowledge of load-bearing systems, design, free profiles and bridge equipment.

1.4. Content of the course

History of Bridge Construction; terminology; types of bridges; elements of the bridge layout; bridge design elements, traffic conditions, load-bearing structures in bridges, bridge equipment.
Loads and actions on bridges.
Building bridges.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%.
Satisfaction of activities that evaluate the acquisition of learning outcomes.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce	0.25	Essay		Research	
Project	1.25	Continuous Knowledge Assessment		Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and grading is carried out during classes (50% of points) and at the final exam (50% of points). Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Marić, Z.: Bridges I, Faculty of Civil Engineering, Osijek, 2016.
2. Radić, J.: Bridges, Home and World, Zagreb, 2002.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Tonković, K.: Designing Bridges, Tehnička knjiga, Zagreb, 1985.
2. Šram, S.: Bridge Construction, Golden Marketing, Zagreb, 2002.
3. Pržulj, M.: Bridges, Association Construction, Belgrade, 2014.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Marić, Z.: Bridges I, Faculty of Civil Engineering, Osijek, 2016.	10	25
Radić, J.: Bridges, Home and World, Zagreb, 2002.	12	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Saša Čohar Mančić, Senior Lecturer	
Course	**German Language**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**3.0**
	Number of hours (L+E+S)	**10+15+5**

1. DESCRIPTION OF THE COURSE		
1.1. Course objectives		
Training students to use English in spoken form in everyday communication, and in spoken and written form as a profession.		
1.2. Conditions for enrolment in courses		
-		
1.3. Expected learning outcomes for the subject		
1. Define basic vocabulary terms from a specific area of construction. 2. Define specific vocabulary terminology from certain areas. 3. Successfully use the acquired vocabulary and grammatical structures. 4. Apply the acquired knowledge in everyday communication, and in communication in the function of the profession. 5. Successfully solve tasks related to the acquired vocabulary and grammatical structures. 6. Present the topic of the assigned seminar paper orally and in writing.		
1.4. Content of the course		
Lexical topics (general lexicon and professional and professional terminology): - fields of work, building materials, ancient structures, transport, environmental protection, bridges, tunnels, airports, hydrotechnical structures, important architects - phrases and idioms that are used in everyday communication, and their root is a term whose basic meaning refers to a building. **Grammatical topics** (general grammatical laws of the German language, specific grammatical structures inherent in a professional language): - formation-morphological level (types of words, morphological changes, word formation), - syntactic level (types of sentences, sentence parts, order of sentence components; use and arrangement of verb tenses; active-passive relationship).		
1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at classes in accordance with the Study Regulations.
One written and one oral colloquium and a presentation on a given topic. The points achieved in the activities are added up (written 50%, oral 30%, presentation 20% of points). The condition for passing the course and entering the grade and ECTS credits is a total of 50% of the points achieved.

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper	0.4	Experimental work	
Written exam	1	Viva voce	0.6	Essay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

The written colloquium contains tasks of an objective type.
At the oral colloquium, the acquired competence of speech expression is evaluated (20% vocabulary, 50% free retelling of content, 30% oral translation). The presentation evaluates linguistic expression on a given topic and the acquisition of grammatical and lexical content (50% + 50%).

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Kralj Štih, A.: Deutsch im Bauingineurwesen, Hrvatska sveučilišna naklada, Zagreb, 2004.
2. Engler T., Deutsche Grammatik – kein Problem, Školska knjiga d.d., Zagreb, 2002.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. N. Thulen – Exercises (online)
2. Grammar Training German, Langenscheidt, Berlin and Munich, 2001.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Kralj Štih, A.: Deutsch im Bauingineurwesen, Hrvatska sveučilišna naklada, Zagreb, 2004.	4	25
Engler T., Deutsche Grammatik – kein Problem, Školska knjiga d.d., Zagreb, 2002.	4	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Rosanda Ivetic Salopek, Lecturer	
Course	Maintenance of Structures	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	5.0
	Number of hours (L+E+S)	30+15+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Acquiring the knowledge necessary to manage and manage building maintenance projects.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

1. Interpretation of basic and specific concepts related to the maintenance of buildings
2. Appropriate use of positive legislation
3. Recognize the required level of maintenance of the building (regular maintenance, reconstructions, repairs and emergency interventions) and priorities in the maintenance of buildings
4. Plan, organize and manage the execution of maintenance works on buildings taking into account the specifics of buildings protected by law
5. Develop a project for the maintenance of a simpler building with cost calculation

1.4. Content of the course

Introduction and general terms
State of regulation in the field of maintenance of buildings
Regular maintenance, reconstructions, repairs and emergency interventions
Maintenance cost structure
Maintenance of buildings in the context of the entire construction process
Building Maintenance Management
Maintenance Project
Planning and organization of maintenance works
Maintenance of old and legally protected buildings
Models for prioritizing building maintenance
Information System for Decision Support in Prioritization in Maintenance

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at classes 70%, program, exam.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper		Experimental work	
Written exam	2	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	
Portfolio		Program	1.5				

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Creation and submission of the program, attendance and activity in class – 70%, exam – 30%.
According to the current Ordinance on Studies of the University of Rijeka and the Ordinance on Evaluation and Evaluation of Work
students at the Faculty of Civil Engineering, University of Rijeka

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Lectures and exercises at LMS Merlin
2. Marenjak, S.; Krstić, H.: Maintenance of Public Buildings, Faculty of Civil Engineering and Architecture Osijek, 2021.
3. Ordinance on Maintenance of Buildings, Official Gazette 122/2014-2343
4. Regulation on the maintenance of buildings, OG 64/1997

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Wood, B.: Building maintenance, Blackwell Publishing, 2009.
2. Spedding A.: CIOB Handbook of Facilities Management, Longman Scientific & Technical, 1994.
3. Aničić, D.: Planning of the Useful Life of a Building, Construction Yearbook 03/04, Zagreb, 2004.
4. The Royal Academy of Engineering: The long term costs of owning and using buildings, The Royal Academy of Engineering, London, 1998.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Lectures and exercises at LMS Merlin	online	25
Marenjak, S.; Krstić, H.: Maintenance of Public Buildings, Faculty of Civil Engineering and Architecture Osijek, 2021.	4	
Ordinance on Maintenance of Buildings, Official Gazette 122/2014-2343	online	
Regulation on the maintenance of buildings, OG 64/1997	online	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Adriana Bjelanović, Ph.D.	
Course	**Fundamentals of Timber Structures**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**30+30+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Introduction to the methodology of designing wooden structures and practical application of the acquired basic knowledge by creating a simplified main project of a simple wooden structure in a team. The acquired basic knowledge about the properties of wood and wood materials and products, typology and ensuring spatial stability of simple wooden structures, dimensioning of structural elements, the influence of joining techniques on the structural design of connections and the calculation of joints will enable students to acquire professional competencies for the design of simple wooden structures, cooperation in the design of more complex structures and future training in the field of wooden structures and load-bearing structures in general.

1.2. Conditions for enrolment in courses

Introduction to the Design of Civil Engineering Structures - passed
Solid Body Mechanics 1 - passed
Solid Body Mechanics 2 - passed
Statics of Linear Structures 2 - *enrolled*

1.3. Expected learning outcomes for the subject

1. Apply basic knowledge about the physical and mechanical properties of wood to the design of timber structures and recognize the importance of other properties for the design, durability and fire resistance of timber structures.
2. Distinguish between wood materials and products for longitudinal and slab structural elements and the impacts of application on the typology of construction and techniques of joining structural elements.
3. To create a layout plan of a simple timber structure with a solution for spatial stability.
4. Calculate the effects of actions for the relevant design combinations and check the limit states of the structural elements.
5. Make drawings (design solutions) of characteristic connections in simple timber structures and calculate the joints (at the basic level).
6. Define systems of measures to ensure the durability of the timber structure and fire resistance.
7. To create a (team) simplified main design of a simple timber structure using design methodology and professional regulations, as well as computer programs for drawing and static analysis.
8. Work in an organized and team manner on the development of the project, taking into account professional and ethical principles, design methodology and professional regulations, and argue the selected technical solution.

1.4. Content of the course

An overview of the historical development of timber structures and the basics of the ecological significance of the application. Basics of spatial stability of timber structures. Properties of wood as a construction material and the influence of properties on the design, durability and fire resistance of wooden structures. Construction materials and products made of wood and based on wood – overview and application for duty and panel structural elements, strength classes and grading procedures for duty wood products. Calculation of serviceability and mechanical resistance of cross-section and stability of elements of timber structures. The basics of joining techniques – traditional and engineering. Calculation of compounds. Joints in timber structures – inspection, construction and installation. The basics of durability and protection of timber structures. Basics on the behavior of wood and timber structures exposed to fire. Type lattice main beams and the influence of joining techniques – principles of force transmission and connection design. Design solutions for connections in connection systems and lattice couplings of simple timber structures.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70% of classes (lectures, auditory and design exercises).
Satisfaction of activities that evaluate the acquisition of learning outcomes: activity in class, development and discussion of a simplified project of a simple timber sturcture in a team (three-member), colloquia, final exam.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity	0.5	Seminar paper		Experimental work	
Written exam	0.5	Viva voce		Essay		Research	
Project	1.75	Continuous Knowledge Assessment	0.75	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and grading are carried out during classes (70% of grade points) and at the final exam (30% of grade points). The final exam is numerical and the use of all materials is allowed. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Bjelanović, A., Rajčić, V.: Wooden Structures According to European Standards, Croatian University Publishing and Faculty of Civil Engineering, University of Zagreb, Zagreb, 2005, reissue, 2007, e-edition 2020.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Excerpts from lectures / internal scripts and excerpts from auditory exercises (course website)
2. Examples of solved exam tasks and theoretical questions for cont. knowledge tests (course website)

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course		
Title	*Number of copies*	*Number of students*
Bjelanović, A., Rajčić, V.: Wooden Structures According to European Standards, Croatian University Publishing and Faculty of Civil Engineering, University of Zagreb, Zagreb, 2005, reissue, 2007, e-edition 2020.	12+ online	25
1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies		
Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.		

LIST OF COURSES

General information		
Course leader	Prof. Ivica Kožar, Ph.D.	
Course	**Fundamentals of Building Physics**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	2./3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	3.0
	Number of hours (L+E+S)	20+0+10

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Training for independent solving of practical engineering problems in this subject.

1.2. Conditions for enrolment in courses

-

1.3. Expected learning outcomes for the subject

1. Independent solving of practical engineering problems from the mentioned subject.
2. Knowledge of the basic equations of diffusion and heat.
3. Know how to calculate thermal resistance and moisture transfer resistance of high-rise buildings using special computer programs.
4. Know how to calculate thermal resistance and moisture transfer resistance of high-rise buildings according to Croatian standards.

1.4. Content of the course

Introduction. Modeling of the basic equations of diffusion and heat. Modeling of the Helmholz wave equation. Computer programs for calculating the thermal and sound resistance of high-rise buildings.

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☐ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attending lectures, creating program tasks on the computer.

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper	0.5	Experimental work	
Written exam		Viva voce		Essay		Research	
Project	1	Continuous Knowledge Assessment	0.5	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam.
The total proportion of points that can be earned is 100% during classes.
Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Kožar, Ivica: Computer Programs, Construction Yearbook 1997, pp.565-574.
2. Chapra, S.C., Canale, R.P.: Numerical Methods for Engineers, McGraw Hill, 1988.
3. MathCAD 2001 user manual.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Gertis, K., Mehra, S-R., Veres, E., Kießl, K.: Building Physics Task Collection with Solutions, Teubner, Stuttgart, 1996.
2. Ožbolt, J., Kožar, I., Eligehausen, R., and Periškić, G., (2005). "Transient 3D Thermo-mechanical Model for Concrete," Concrete and Reinforced Concrete Construction, in press (to be published in January, 2005).

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Kožar, Ivica: Computer Programs, Construction Yearbook 1997, pp.565-574.	1	25
Chapra, S.C., Canale, R.P.: Numerical Methods for Engineers, McGraw Hill, 1988.	1	
MathCAD 2001 user manual.	online	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Petra Jagodnik, Ph.D.	
Course	**Fundamentals of Engineering Geology**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**15+20+10**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

The course prepares students to understand the fundamental principles of engineering geology and its role in civil engineering. Students will know possible engineering problems in different types of geological materials conditioned by their genetic characteristics. Students will be able to recognize geomorphological phenomena on modern topographic bases. Students will know the possibilities of applying engineering geological research methods for various engineering purposes. The course prepares students for the next courses of the Graduate University Study, primarily in the field of Geotechnics.

1.2. Conditions for enrolment in courses

-

1.3. Expected learning outcomes for the subject

1. Understand the principles of engineering geological research and the role of an engineering geologist.
2. Know the most common types of engineering problems in rocks and soil conditioned by their genesis.
3. List the types of geohazards. Understand their impact on construction conditions.
4. Recognize the types of geomorphological processes and phenomena on topographic substrates.
5. Know the possibilities of application and limitations of field research methods for various engineering purposes.

1.4. Content of the course

Introduction to engineering geology: basic principles and objects of research, importance for construction practice.
Engineering Geological Map of the Republic of Croatia.
Sedimentation processes and sedimentation environments – significance for engineering geological conditions of the area.
Engineering problems in rocks conditioned by rock genesis.
Engineering problems in the soil conditioned by soil genesis.
Geohazardi.
Program and application of field research methods for various engineering purposes.
Remote sensing in engineering geology.
Engineering Geology and Spatial Planning.
Engineering geological project documentation.

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attending lectures and exercises. Making a field diary. Presentation of the seminar paper.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper	1	Experimental work	
Written exam	1.5	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Creating exercises assignments.
Preparation of a field report.
Presentation of a short seminar paper made by a team of students.
Taking a written final exam.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Vlahović, T.: Geology for Civil Engineers. University of Split, Faculty of Civil Engineering and Architecture, 2011
2. Šestanović, S.: Basics of Engineering Geology – Application in Construction. Geoing, Split 1993.
3. Gonzalez de Valleyo, L., Ferrer, M.: Geological Engineering. CRC Press, 2011.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Tišljar, J: Sedimentology of Clastic and Silica Precipitations, Institute for Geological Research, Zagreb, 2004.
2. Tišljar, J.: Sedimentary Rocks. Školska knjiga, Zagreb, 1994.
3. Pollak, Z.: Hydrogeology for Civil Engineers. Poslovna knjiga, Zagreb, 1995.
4. Benac, Č.: Dictionary of Terms in Applied Geology, www.gradri.uniri.hr

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Vlahović, T.: Geology for Civil Engineers. University of Split, Faculty of Civil Engineering and Architecture, 2011	5	25
Šestanović, S.: Basics of Engineering Geology – Application in Construction. Geoing, Split 1993.	5	
Gonzalez de Valleyo, L., Ferrer, M.: Geological Engineering. CRC Press, 2011.	2	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Asst. Prof. Josip Peranić, Ph.D.	
Course	**Fundamentals of Unsaturated Soil Mechanics**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**3.0**
	Number of hours (L+E+S)	**20+0+10**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Introducing students to the basic aspects of soil behavior under conditions of partial saturation. The student is able to describe the influence of moisture change on the hydro-mechanical behavior of the soil in unsaturated conditions. The student knows the basic methods of measuring and estimating nonlinear functions of unsaturated soil features.

1.2. Conditions for enrolment in courses

Soil and Rock Mechanics – passed

1.3. Expected learning outcomes for the subject

1. Enumerate and describe the basic variables that quantify the volume and mass ratios of individual phases in unsaturated soil.
2. Describe, select and interpret the hydraulic characteristics of different soil types.
3. Describe the influence of moisture changes on the strength of unsaturated soil.
4. Enumerate, describe and select methods for measuring and evaluating the functions of unsaturated soil characteristics.

1.4. Content of the course

Basic problems of the mechanics of unsaturated soil
Typical profiles of unsaturated soils
Phase diagram and basic characteristics of phases in unsaturated soil
Surface tension and capillarity
Variables for the description of volume and mass relationships in unsaturated soil
Stress condition in unsaturated soil
Retention curve of unsaturated soil
Hydraulic conductivity function of unsaturated soil.
Shear strength of unsaturated soil
Basic methods of measuring and evaluating the functions of unsaturated soil characteristics

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☐ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☒ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attending classes min. 70%
Implementation of measurements (experimental work), preparation and presentation of an independent seminar paper
Taking the colloquium

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper	0.5	Experimental work	0.5
Written exam		Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment is carried out during classes. The total proportion of points that can be earned is 100% during classes. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Lu, N. & Godt, J., 2013. Hillslope Hydrology and Stability. s.l.:Cambridge University Press, 2013.
2. Zhang, L., Li, J., Li, X., Zhang, J., & Zhu, H.: Rainfall-Induced Soil Slope Failure: Stability Analysis and Probabilistic Assessment (1st ed.). CRC Press, 2016. https://doi.org/10.1201/b20116

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
		25

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Asst. Prof. Nino Krvavica, Ph.D.	
Course	**Fundamentals of Coastal Engineering**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**5.0**
	Number of hours (L+E+S)	**30+30+0**

1. DESCRIPTION OF THE COURSE		
1.1. Course objectives		
To ensure that within the course students master the basic elements of physical oceanography and wave mechanics, as well as engineering perception and solving the problem of the interaction of the sea with coastal/underwater/protective structures and the natural coast, as well as the dimensioning of protective maritime and port structures. To train students to independently solve basic tasks in the field of coastal engineering.		
1.2. Conditions for enrolment in courses		
Hydrology – passed		
1.3. Expected learning outcomes for the subject		
1. Define and describe basic processes in the field of physical oceanography and wave mechanics. 2. Describe and calculate the processes of generation and deformation of waves from the deep-water area to the coast. 3. Describe and explain the characteristics of the basic types of coastal structures. 4. Describe and calculate the effect of the sea on coastal structures. 5. To size and graphically depict the basic types of coastal structures. 6. To identify the impact of climate change on coastal structures.		
1.4. Content of the course		
Movement of the sea, winds, waves and sea currents Mechanics of sea waves Statistical description of sea waves and sea levels Forecast of deep-water wind waves Deformations of sea waves in the coastal area and shallow water Characteristics of external maritime structures (breakwaters, breakwaters and breakwaters) Sea action and dimensioning of breakwaters and coastal walls The impact of climate change on coastal structures and marine flooding		
1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☒ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%.
Satisfaction of activities that evaluate the acquisition of learning outcomes: attendance, program, periodic testing of knowledge and final exam.

1.8. Monitoring student work

Attending classes	2	Teaching activity		Seminar paper		Experimental work	
Written exam	1	Viva voce		Essay		Research	
Project	1	Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam.
The total proportion of points that can be earned is 70% during classes and 30% in the final exam.
Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. US Army Corps of Engineers (2013): Coastal Engineering Manula (CEM), EM-1110-2-1100. USA.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. J. Kirinčić (1991): Ports and Terminals, Školska knjiga, Zagreb.
2. Bosboom, J., Stive M.J.F (2022): Coastal Dynamics, TU Delft, Delft, Netherlands.

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
US Army Corps of Engineers (2013): Coastal Engineering Manula (CEM), EM-1110-2-1100. USA.	online	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Bojan Bilić, Senior Lecturer	
Course	**Fundamentals of Spatial Planning**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**3.0**
	Number of hours (L+E+S)	**20+0+10**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Introducing students to the theory and practice of urban and spatial planning and standard types of spatial planning documentation (features, components, methodology of making, adoption and management), so that builders can participate in understanding and connecting jobs in construction with the process of planning and managing space.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

1. Explain the basic terms according to the regulations of spatial planning and recognize their meaning and characteristics
2. List the types of spatial plans
3. Explain the objectives of spatial planning
4. List the phases of spatial planning and explain them
5. Recognize entities in spatial planning and their roles
6. Identify the parts of the spatial plan and explain their roles
7. Define the spatial planning team
8. Explain and recognize the importance and phases of urbanism
9. Analyze and/or create a spatial plan in the given segments

1.4. Content of the course

Spatial Planning Regulation
Types of plans (in addition to basic)
Objectives of development and process of development of spatial plans
Subjects in spatial planning in their roles
Parts of the spatial plan
Interdisciplinarity of the spatial plan
Urbanism – the importance of urbanism
Significance of cities, historical development of urbanism
Urban structure – physical, functional, social aspects
Zoning
Housing in urban plans – primary and secondary functions, infrastructure, organization

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☐ exercises ☐ Distance education ☒ Field Teaching	☒ Independent tasks ☒ Multimedia & Network ☐ laboratory ☒ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attending classes 100%
Satisfaction of activities that evaluate the acquisition of learning outcomes: class activity, colloquium, seminar, etc.

1.8. Monitoring student work

Attending classes	1	Teaching activity	0.5	Seminar paper	1	Experimental work	
Written exam		Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	0.5	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment is carried out during classes. The total proportion of points that can be earned is 100% during classes. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.
Active teaching and independent work
Creating a seminar on a given seminar assignment.
Presentation of the prepared seminar paper, discussion / assessment of the adoption of the material.
Colloquiums / assessment of the acquisition of material.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Štimac, M., Spatial Planning in Practice, Gloss, 2010.
2. Ambruš, D., Mechanical City, STRAND, 2020.
3. Marinović-Uzelac, A.: Settlements, Cities and Spaces. - Zagreb: Technical Book, 1986.
4. Marinović-Uzelac, A.: Spatial Planning. - Zagreb, Home and World, 2001
5. The Physical Planning Act and subsequent bylaws. - Official Gazette of the Republic of Croatia.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Marinović-Uzelac, A.: Social Space of the City. - Zagreb: SN Liber, 1986. Meise, J., Volwahsen, A.: Stadtund Regionalplanung, - Wiesbaden: Vieweg & Sohn, 1980.
2. Mumford, L.: The City in History: A Translation from English. - Zagreb: Forward, 1968.
3. Marinović-Uzelac, A.: Theory of Surface Use in Urbanism. - Zagreb: Technical Book, 1989.
4. Milić, B.: The Development of Cities Through the Centuries - Part I and Di II - Zagreb, Školska knjiga, 1994.
5. Le Corbusier, Ch.-Ed.: Mindset in Urbanism. - Belgrade, Construction Book, 1974.
6. Spatial planning documentation (municipality, city, county, country, European Union).

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Štimac, M., Spatial Planning in Practice, Gloss, 2010.	16	25
Ambruš, D., Mechanical City, STRAND, 2020.	1	
Marinović-Uzelac, A.: Settlements, Cities and Spaces. - Zagreb: Technical Book, 1986.	3	
Marinović-Uzelac, A.: Spatial Planning. - Zagreb, Home and World, 2001	8	
Physical Planning Act and Subsequent Bylaws (Official Gazette website)	online	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Iva Mrak, Ph.D.	
Course	**Building Design**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	2.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**20+25+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Understanding the importance of construction in creating living human space. Understanding development construction throughout history. Understanding the phases of designing and realizing space – from the spatial plan until construction. Knowledge of the approach to design housing as a basic category of construction. Craftsmanship project of a smaller residential unit and the elaboration of part of the detailed design using modern construction product and technology.

1.2. Conditions for enrolment in courses

Building Elements – passed

1.3. Expected learning outcomes for the subject

1. Enumerate and identify types of residential buildings and smaller public buildings.
2. Analyze the basic principles of design.
3. Apply the basic principles of design.
4. List the basic characteristics of the historical development of construction, especially housing.
5. List the key people, plans and projects that defined the emergence of a modern approach to design, especially housing.
6. Indicate the stages and characteristics of the development of the plan and projects, including the role of the different actors in planning and design.
7. Distinguish the basic types of residential construction and list their characteristics, residential and urban.
8. Organize individual living spaces and one smaller housing unit.
9. Develop a conceptual design for a smaller residential unit and/or develop a part of the detailed design using modern construction products and technologies.

1.4. Content of the course

1. Elements of historical development.
2. Approach to design, from spatial plan to detailed design, site analysis, program, orientation, building physics, technical construction conditions, regulations, fire protection, at work, conservation protection.
3. Development of housing, individual and multi-dwelling. Function, construction, design.
4. Typological division of residential buildings.
5. Multi-apartment buildings.
6. Elements of the function of the apartment, horizontal and vertical layout, equipment, usable space. Function groups, living room, farm, sleeping tract, auxiliary spaces.
7. Staircases, installation guides, heating of individual buildings, common areas.
8. The choice of materials, construction and technology for the construction of residential buildings.

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☒ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attending classes 100%
Satisfaction of activities that evaluate the acquisition of learning outcomes: class activity, colloquium, program, etc.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity	0.5	Seminar paper		Experimental work	
Written exam		Viva voce		Essay		Research	
Project	1	Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment is carried out during classes. The total proportion of points that can be earned is 100% during classes. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Biondić, Lj., Introduction to the design of residential buildings, Golden marketing - Technical book, 2011.
2. Technical Encyclopedia, Miroslav Krleža Institute of Lexicography, Zagreb, 1963-1997
3. Knežević G., Kordiš I.: Residential and Public Buildings, Tehnička knjiga, Zagreb 1984.
4. Knežević, G.: Residential Buildings, Tehnička knjiga, Zagreb 1984.
5. Neufert: Elements of Architectural Design, Golden Marketing, Zagreb 2002
6. Vrkljan Z.: Equipment of Construction Drawings – Detailed Drawings, Zagreb 1965.
7. Štulhofer, A. and Veršić, Z.: Drawing Architectural Designs: Accessories and Basics, Zagreb, 1998.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Ching, F. D. K., Architecture: Form, Space, & Order, Wiley, 2014.
2. Cornoldi, A., L' architettura della casa, Officina, Milan, 1988.
3. Pleština, L., Modular (modulated) family houses, 12[2004] 2[28] SPACE
4. Pleština, L., Traditional Elements in Croatian Architecture of Family Houses during the 20th Century, 4(1996), No. 2(12) SPACE
5. Fawcett, A. P., Architecture: Design Notebook, Architectural Press, Oxford, 1998.
6. Production programs of construction products.
7. Magazines Oris, Detail...
8. Additional literature according to the topics of lectures recommended during classes.
9. Other sources: www.archdaily.com, europaconcorsi.com, www.greatbuildings.com, www.oma.eu, www.rpbw.com, www.mvrdv.nl, www.miessociety.org, www.fondationlecorbusier.fr ...

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Biondić, Lj., Introduction to the design of residential buildings, Golden marketing - Technical book, 2011.	2	25
Technical Encyclopedia, Miroslav Krleža Institute of Lexicography, Zagreb, 1963-1997	1	
Knežević G., Kordiš I.: Residential and Public Buildings, Tehnička knjiga, Zagreb 1984.	6	
Knežević, G.: Residential Buildings, Tehnička knjiga, Zagreb 1984.	5	
Neufert: Elements of Architectural Design, Golden Marketing, Zagreb 2002	13	
Vrkljan Z.: Equipment of Construction Drawings – Detailed Drawings, Zagreb 1965.	6	
Štulhofer, A. and Veršić, Z.: Drawing Architectural Designs: Accessories and Basics, Zagreb, 1998.	3	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Neira Torić Malić, Ph.D.	
Course	**Computer Programs**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	3.0
	Number of hours (L+E+S)	0+30+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

To train students to work independently in a CAD environment using advanced functions.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

1. Distinguish between different graphic image formats
2. Know how to download, edit and create different raster graphics formats
3. Know the principles of CAD and BIM technology
4. Set up, plan and create a complex task from vector graphics
5. Use advanced properties and elements of vector drawings
6. Exchange raster and vector drawings between different computer tools (copy, import and export)

1.4. Content of the course

Introduction to CAD, CAM CAE technologies
Overview of CAD programs in general with special reference to those established in construction
Steps in Computer Aided Design
Work in a CAD program for technical drawing and design: environment, commands for drawing, editing, object exchange, drawing organization, dimensioning, scale, preparation for printing, printing
Application of basic and advanced functions of CAD tools for creating a model of a simple object in 2D and 3D
Import and export of data (exchange with other computer tools and file formats)
CAD tools that support BIM technology

1.5. Types of teaching	☐ lectures ☒ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Students are required to attend lectures regularly, pass a colloquium, actively participate in seminars and workshops, create and present a seminar paper.

1.8. Monitoring student work

Attending classes		Teaching activity	1	Seminar paper		Experimental work	
Written exam		Viva voce		Essay		Research	
Project	0.5	Continuous Knowledge Assessment	0.5	Report		Practical work	1
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Preparation of project work, activity in class, colloquiums - 100% through classes.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

Otković, I. I., Koški, Ž. Zgvozda, M., Technical Drawing with the Application of AutoCAD, Osijek, Faculty of Civil Engineering, 2015

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Otković, I. I., Koški, Ž. Zgvozda, M., Technical Drawing with the Application of AutoCAD, Osijek, Faculty of Civil Engineering, 2015	1	25

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Asst. Prof. Martina Vivoda Prodan, Ph.D.	
Course	Field Testing in Geotechnics	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	4.0
	Number of hours (L+E+S)	15+15+15

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

The course introduces students to possible field tests in soil and rock mass and standards for conducting field geotechnical tests.
Students will be able to independently plan and conduct basic geotechnical investigations with field equipment available in the Geotechnical Laboratory. Students will be able to independently process and interpret the results of field tests. The course prepares students for the next courses of the Graduate University Study, primarily in the field of Geotechnics.

1.2. Conditions for enrolment in courses

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1.3. Expected learning outcomes for the subject

1. Know the types of field tests in soil and rock mass.
2. Know the standards and devices for conducting geotechnical field tests.
3. Ability to independently conduct basic geotechnical field tests in the soil to determine basic characteristics, strengths, deformation characteristics.
4. Ability to independently conduct basic geotechnical field tests in the rock mass to describe the rock mass, determine index parameters and strength.
5. Processing, understanding and interpretation of field geotechnical test results.

1.4. Content of the course

Introduction to field tests in geotechnics.
Identification of elements of the geological structure.
Engineering description of the rock mass.
Field determination of basic soil parameters (density, natural moisture...).
Field determination of soil strength (wing probe, pocket penetrometer, portable device for direct shear).
Field determination of soil deformation characteristics (dynamic plate).
Field measurement of groundwater levels and pore pressures in the soil.
Field determination of index parameters of rock mass.
Field determination of rock strength (Schmidt's hammer, portable PLT).
Field measurement of soil and rock displacement with an inclinometer.

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attending lectures and exercises. Processing of the results of field investigations and their presentation.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper	0.5	Experimental work	
Written exam	1.5	Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	0.5
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Attendance and active participation in classes.
Preparation and presentation of the seminar paper.
Taking a written final exam.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Holtz, R.D., Kovacs, W.D., Sheahan, T.C.: An introduction to geotechnical engineering, Pearson, New Jersey, p.853, 2010.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. Dunnicliff, J.: Geotechnical instrumentation for monitoring field performance, New York , Wiley, 1988

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Holtz, R.D., Kovacs, W.D., Sheahan, T.C.: An introduction to geotechnical engineering, Pearson, New Jersey, p.853, 2010.	3	25

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Prof. Ivica Kožar, Ph.D.	
Course	**Introduction to Programming**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	1.	
Credit Value and Course Delivery	ECTS coefficient of student workload	3.0
	Number of hours (L+E+S)	10+20+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

The aim of the course is to get a clear idea of the key information technologies that can be used in the professional field. The student will learn how to create a software solution using a computer from the definition of a problem problem. The student will gain knowledge that allows him to create simpler programs using VBA tools over applications such as Excel, Word, etc., and get acquainted with the concept of a database.

1.2. Conditions for enrolment in courses

-

1.3. Expected learning outcomes for the subject

1. Describe the purpose of programming and software development.
2. Describe the evolution of modern programming languages with reference to common characteristics, as well as the differences between them.
3. Identify a problem that requires a programmatic solution.
4. Apply variables in computer programming.
5. List and describe the operators.
6. Apply conditional commands.
7. Apply loops in the execution of a computer program.
8. Design subprograms.
9. Predict errors in program execution.
10. Create a simple computer program on your own.

1.4. Content of the course

Programming, coding, programming languages and their classification, specialized languages (DSL), scripting languages, compilers and interpreters, algorithm, steps in programming: from defining a programming task to maintaining an application, object-oriented programming, VBA – Visual Basic for Application, VBA for Excel, Databases.

1.5. Types of teaching	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attending lectures and exercises, creating assigned tasks in exercises, presenting one program to other students at the seminar.

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper		Experimental work	
Written exam		Viva voce		Essay		Research	
Project	1	Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment are carried out during classes and at the final exam.
The total proportion of points that can be earned is 100% during classes.
Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

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1.11. Supplementary literature (at the time of submitting the study programme proposal)

1. J. Walkenbach: Excel 2007 Power Programming with VBA, Wiley

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Sanja Dugonjić Jovančević, Ph.D.	
Course	**Environmental Protection and Sustainable Construction**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	3.0
	Number of hours (L+E+S)	10+0+20

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

In addition to getting acquainted with the global challenges of the ecological system and the basic principles of nature and environmental protection, the goals of the course are to get acquainted with the fundamental impact of construction projects on the environment and the principles of sustainable construction and environmental protection.

1.2. Conditions for enrolment in courses

-

1.3. Expected learning outcomes for the subject

1. Connect global changes in the ecological system and the functioning of its components
2. Comment on the fundamental impacts of construction projects on the environment and the principles of environmental protection
3. Explain the course of procedures for obtaining a decision on the acceptability of the impact of the project on the environment
4. List the principles of sustainable development and sustainable construction
5. Explain the cycle of building materials and products
6. Connect the principles of energy efficiency and low-energy construction
7. Analyze the principles of using alternative energy sources
8. Analyze the challenges of waste management and the possibilities of its recovery

1.4. Content of the course

Global changes in the ecological system and its functioning.
Applicable legislation and basic principles of environmental protection.
Basic impacts of construction projects on the environment.
Procedures for obtaining a decision on the acceptability of the impact of the project on the environment.
Sustainable development and sustainable construction.
Building materials and products cycle
Application of recycled products in construction.
Energy efficiency and low-energy construction.
Alternative sources of energy.
Waste management and reuse.

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☐ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Attendance at least 70%.
Satisfaction of activities that evaluate the acquisition of learning outcomes: activities in class, preparation and defense of a seminar paper, colloquium.

1.8. Monitoring student work

Attending classes	1	Teaching activity		Seminar paper	1	Experimental work	
Written exam		Viva voce		Essay		Research	
Project		Continuous Knowledge Assessment	1	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Evaluation and assessment is carried out during classes. The total proportion of points that can be earned is 100% during classes. Details of the method of monitoring and evaluating the work of students are presented in the course implementation plan.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Lectures at LMS Merlin
2. Positive regulation and strategies of the Republic of Croatia related to the environment

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Lectures at LMS Merlin	online	25
Positive regulation and strategies of the Republic of Croatia related to the environment	online	

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

LIST OF COURSES

General information		
Course leader	Assoc. Prof. Sanja Šurdonja, Ph.D.	
Course	**Railway Engineering**	
Study program	University Undergraduate Study of Civil Engineering	
Course status	Electoral	
Year	3.	
Credit Value and Course Delivery	ECTS coefficient of student workload	**4.0**
	Number of hours (L+E+S)	**25+20+0**

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

The aim of the course is for students to master the basics of designing the railway route by applying different elements of the upper and lower structure.

1.2. Conditions for enrolment in courses

Fundamentals of Road Design 1 – passed

1.3. Expected learning outcomes for the subject

1. Define the basic horizontal and vertical geometric elements of the railway track route
2. Calculate the basic horizontal and vertical geometric elements of the track alignment
3. Describe lines and trains of different categories and define the basic properties and impact of them
4. Define the elements of the upper and lower structure of the line

1.4. Content of the course

Railway as a means of transport
Historical overview of the railway and development
Division of tracks and trains
Cross-section of the line
Upper and lower structure of the line
Driving-dynamic calculation, resistances
Laying the horizontal and vertical course of the track route
Elements of the railway project: situation, longitudinal profile, transverse profiles, technical description
Management and maintenance of railway infrastructure
Stations

1.5. Types of teaching	☒ lectures ☒ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Comments		

1.7. Obligations of students

Periodic examination of knowledge, preparation of program tasks, creation and presentation of seminar papers, attendance and active participation in classes.

1.8. Monitoring student work

Attending classes	1.5	Teaching activity		Seminar paper	0.25	Experimental work	
Written exam	0.75	Viva voce		Essay		Research	
Project	0.75	Continuous Knowledge Assessment	0.75	Report		Practical work	
Portfolio							

1.9. Procedure and examples of assessment of learning outcomes during classes and at the final exam

Creation of program tasks.
Preparation and presentation of the seminar paper.
Periodic examination of knowledge.
Final knowledge test.

1.10. Compulsory literature (at the time of submitting the study programme proposal)

1. Marušić, D., Design and construction of railway lines, GF Split, Split, 1994.

1.11. Supplementary literature (at the time of submitting the study programme proposal)

1.12. Number of copies of compulsory literature in relation to the number of students currently attending classes in the course

Title	*Number of copies*	*Number of students*
Marušić, D., Design and construction of railway lines, GF Split, Split, 1994.	8	25

1.13. Methods of quality assurance that ensure the acquisition of learning outcomes, skills, and competencies

Quality monitoring procedures prescribed by the Quality Manual of the Faculty of Civil Engineering in Rijeka are carried out.

The sets of learning outcomes shown in Table 4 include compulsory and elective courses. Students who pass the indicated elective courses of a particular conference acquire area-specific competencies.

Table 4.

A set of learning outcomes	Required subjects	ECTS	Elective courses	ECTS	Total ECTS
Constructions	Introduction to the Design of Civil Engineering Structures	3,0	Environmental Protection and Sustainable Construction	3,0	26
	Fundamentals of Concrete Structures	6,0	Bridges	4,0	
	Fundamentals of Steel Structures	5,0	Fundamentals of Timber Structures	5,0	
Fundamentals of hydraulic structures and systems	Hydrology	4,0	Environmental Protection and Sustainable Construction or Fundamentals of Spatial Planning	3,0	26
	Hydromechanics	5,0	Hydrotechnical Measures for Adaptation to Climate Change	4,0	
	Fundamentals of Hydraulic Engineering	5,0	Fundamentals of coastal structures	5,0	
Fundamentals of the application of organizational and technological measures in construction	Construction Technology	3,0	Environmental Protection and Sustainable Construction	3,0	25
	Civil Engineering Regulations	3,0	Construction Management	4,0	
	Construction Organization	4,0	Maintenance of Buildings	5,0	
	Construction Economics	3,0			
Fundamentals of building design and maintenance	Building Elements	6,0	Fundamentals of Building Physics	3,0	24
	Introduction to the Design of Civil Engineering Structures	3,0	Computer Programs	3,0	
			Building Design	4,0	
			Maintenance of Buildings	5,0	
Fundamentals of geotechnics	Geology	3,0	Fundamentals of Unsaturated Soil Mechanics	3,0	25
	Soil and Rock Mechanics	5,0	Fundamentals of Engineering Geology or Field Testing in Geotechnics	4,0	
	Fundamentals of Geotechnical Engineering	5,0	Experimental soil mechanics	5,0	
Fundamentals of road planning and design	Geodesy	4,0	Environmental Protection and Sustainable Construction or Fundamentals of Spatial Planning	3,0	25
	Fundamentals of Road Design 1	5,0	Railway Engineering	4,0	
	Fundamentals of Road Design 2	4,0	Urban Roads and Intersections	5,0	