Sveučilište Josipa Jurja Strossmayera u Osijeku
Građevinski i arhitektonski fakultet Osijek
Josip Juraj Strossmayer University of Osijek
Faculty of Civil Engineering and Architecture Osijek

PROFESSIONAL UNDERGRADUATE STUDY OF CIVIL ENGINEERING

EXCERPT FROM
STUDY PROGRAM
(Approved in 2005, amendments in 2009, 2013, 2017, 2021, 2024, 2025)

Osijek, 2025

CONTENT

1 INTRODUCTION

1.1 Josip Juraj Strossmayer University of Osijek, Faculty of Civil Engineering and Architecture Osijek

1.1.1 A brief overview of the historical development of the faculty

The beginnings of the education of civil engineers date back to 1967, when a department of the Technical College from Zagreb was opened in Osijek. This was the result of the increasing market demands and the need for the development of the construction profession in this area, as well as the efforts and incentives of the then experts in the field of construction.

The Higher Technical School of Civil Engineering Osijek was founded in 1976, and since then, civil engineers have been continuously educated for the region's needs. Initially, this institution operated independently, and then, as an organizational part, it joined the Civil Engineering School Center in Osijek, where it remained until 1982. At that time, it was separated and briefly operated independently as the Higher School of Civil Engineering Osijek, and in that period, the establishment of the Faculty of Civil Engineering in Osijek was prepared. To this end, the Higher School of Civil Engineering Osijek was merged with the Department of Materials and Structures in Osijek as an organizational part of the Civil Engineering Institute in Osijek. Based on the above, a new higher education institution began to operate on March 1, 1983, simultaneously as a member of the University of Osijek and as an organizational part of the Civil Engineering Institute Zagreb – OOUR of the Faculty of Civil Engineering of the University of Osijek. In the academic year 1986/1987. The Faculty receives a license for independent studies in civil engineering in the general direction. In this organizational form, it performed scientific-teaching and development-professional activities until 1991, when it became independent, but it also retained the Department for Developmental and Professional Work in its organizational structure. Very soon, on February 7, 1992, the independent Faculty of Civil Engineering of the J. J. Strossmayer University of Osijek was founded, so that the Department for Development and Professional Work was separated from the organizational structure of the Faculty into the Institute of Civil Engineering of Croatia Zagreb – Business Center Osijek. After many years of work and operation at two locations, the construction of a new, modern building on the university campus was completed, and the complete relocation took place in May 2016, significantly improving working conditions at all levels. Given that since the academic year 2016/2017, a completely new university undergraduate study of Architecture and Urban Planning has been carried out, the Faculty of Civil Engineering Osijek changed its name to the Faculty of Civil Engineering and Architecture Osijek (hereinafter: the Faculty) on September 18, 2018.

1.1.2 Previous experience in the implementation of higher education programs

More than 45 years of tradition in the education of civil engineers in Slavonia makes the Faculty of Osijek one of the significant components of the Josip Juraj Strossmayer University of Osijek, recognized in Slavonia, Croatia and Europe. This is evident in students' increased interest in studying at the Faculty and the tendency to shorten their study time. According to the current situation at the Faculty, the quality of teaching programs at undergraduate, graduate and postgraduate studies, the success of scientific and teaching staff, teachers, associates and other staff in all areas of their activities, and the successful management of generated revenues, the Faculty proves its seriousness and high position in higher education and science in the Republic of Croatia.

In more than 45 years of the Faculty's existence, more than 1500 bachelors of civil engineering, 900 university bachelors of civil engineering, 1400 university masters of civil engineering, 130 masters of civil engineering and 30 doctors of technical sciences have obtained their degrees.

The proposal of new study programs of the Josip Juraj Strossmayer University of Osijek, Faculty of Civil Engineering and Architecture Osijek continues the tradition of quality higher education of

construction experts in the region, in line with modern trends in Europe (Bologna Declaration) and the world.

1.1.3 Comparability with programmes of foreign higher education institutions

During the development of study programs and implementation plans, the Faculty participated in the development of the **TEMPUS** project "**Restructuring and Updating of Civil Engineering Curriculum, TEMPUS JEP No. 17062-2002**" in which all 4 faculties of civil engineering from Croatia and an international consortium consisting of 10 European faculties cooperated. This cooperation, as well as active participation in the discussion on the progress of adaptation of technical study plans and programs in the Republic of Croatia, organized by the Ministry of Science, Education and Sports, has led to the harmonization of the program proposals of civil engineering faculties at the Croatian level (differences in the implementation plan of undergraduate studies up to 10%).

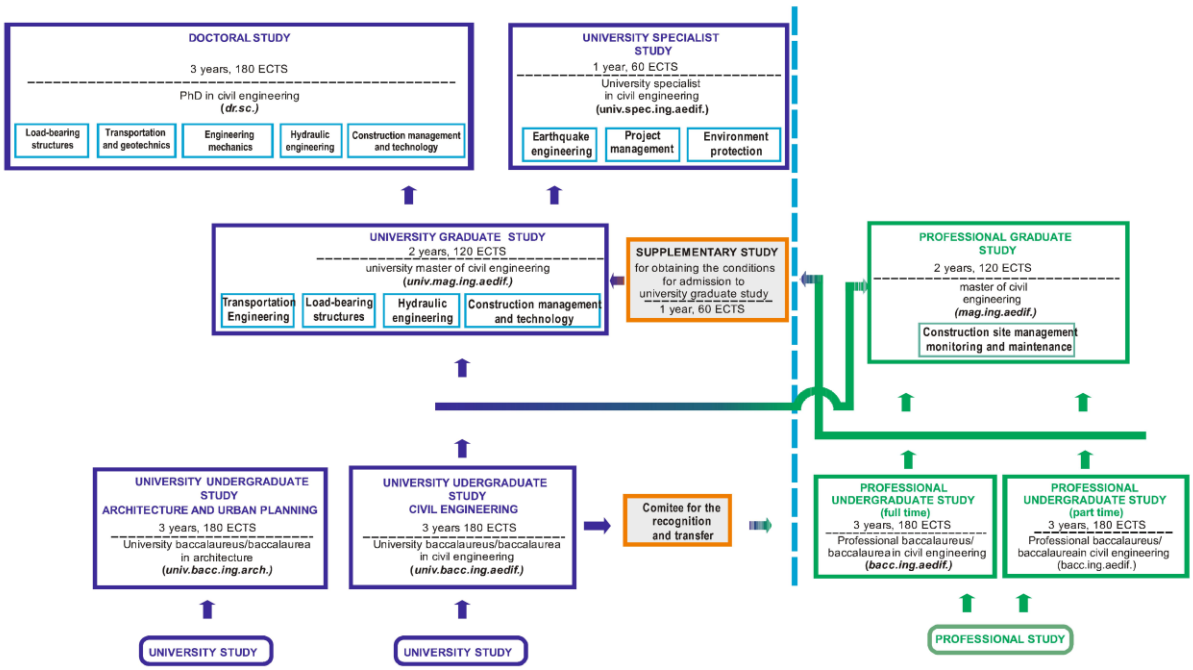
During the development of the program, the contents of the study programs of numerous European and American civil engineering faculties were considered, as well as the guidelines of professional organizations that define engineering competencies in some countries. The curricula of colleges and universities were considered, comparable to the programs of professional studies in Croatia. Some of these institutions are the College of Applied Sciences in Bremen, the Department of Civil Engineering, the Technical University of Aachen, the Technical Polytechnics and the Universities of Graz and Vienna.

We have respected the guidelines **of** EUCEET **(EUropean Civil Engineering Education and Training),** which brings together 136 scientific institutions, of which more than 100 are civil engineering faculties in Europe (EUCEET projects "Harmonizing Civil Engineering Education Across Europe" in 2004). The programs were also harmonized with the guidelines **of SEFI (European Society for Engineering Education),** project "Enhancing Engineering Education in Europe, Innovative Curricula in Engineering Education" from 2003, with the standards of the German institution for accreditation of higher education programs in civil engineering **ASBau (Akkreditierung und Qualitätssicherung zeitgemäßer Studiengänge des Bauingenieurwesens an deutschen Hochschulen)** from 2003**.** and with the criteria for accreditation of engineering programs in the USA **by the Engineering Accreditation Commission, Accreditation Board for Engineering and Technology (ABET)** from 2003 and 2004.

The compilation of **the Bologna Declaration**, the recommendations of the **ASCE Body of Knowledge** Committee and the results of **EUCEET** studies on the essential content of civil engineering studies represent the basic criterion for defining the professional and expert knowledge necessary for every civil engineer.

1.2 Openness of Studies to Student Mobility

The study of civil engineering in Osijek has already declared itself as an international program with its first independent program in 1993, so the openness of the study and the mobility of students is a goal that continues the current practice of the Faculty, where dozens of international students have graduated. The first level of student mobility is ensured by an agreement on the harmonization and mutual recognition of study programs of all Croatian faculties of civil engineering, and the harmonization of programs concerning European standards gives the perspective of mobility at the European level. In addition to the programme's compatibility, mobility also supports the possibility of conducting part of the teaching in English. Also, some of the scientific and teaching staff of the faculty are involved in teaching at other faculties of the University of Osijek.



Graphic representation 1: Mobility of students of the Faculty of Civil Engineering and Architecture Osijek
J.J. Strossmayer University of Osijek

2 GENERAL PART

2.1 Name of the study

The Josip Juraj Strossmayer University of Osijek, Faculty of Civil Engineering Osijek, runs a study program called **Professional Undergraduate Study of Civil Engineering.**

2.2 Study holder

The holder of the study is **the Josip Juraj Strossmayer University of Osijek, Faculty of Civil Engineering and Architecture Osijek.**

2.3 Duration of study

The professional undergraduate study of Civil Engineering lasts **three years**.

2.4 Conditions for enrolment in the study

The selection of applicants is carried out by evaluating success in previous education and according to the results of the state graduation exam.

2.5 Competences

The competencies ***of a professional bachelor of civil engineering*** can be defined as:

- participation in teamwork on planning, calculation of simpler structures and their parts, as well as organizing and managing the construction of simpler buildings

Graduate studies in the Republic of Croatia that he/she can follow if he/she decides to continue his/her studies:

- bachelor of civil engineering enrolls in the university graduate study of civil engineering with attendance and passing the differential year at the Faculty of Civil Engineering and Architecture of the Josip Juraj Strossmayer University of Osijek
- Professional graduate studies.

2.6 Professional or academic title acquired upon completion of studies

- Upon completion of the professional study, the title of **Bachelor (baccalaureus/baccalaurea) civil engineer (bacc.ing.aedif.) is acquired.**

2.7 Learning outcomes of the study programme

1. Apply basic methods of calculation of engineering structures.
2. Participate in the preparation of technical documentation of all types and levels.
3. Participate in the organization and management of construction sites in accordance with regulations.
4. Participate in the process of maintenance of buildings within the defined scope of work.
5. Understand the organizational and technological processes of construction.
6. Participate in business process management in construction companies.
7. Implement the rules of building regulations (legislative framework).
8. Recognize and interpret the key elements of spatial planning documentation in construction projects.
9. Understand and exchange information in the field of the profession.
10. Know the technology used to perform construction work.
11. Optimize resources in a construction project.
12. Use a foreign language in professional communication.

3 DESCRIPTION OF THE PROGRAM

3.1 Implementation plan of the study

	I SEMESTER		**Hours**		**ECTS**
	Subject	Teacher	Lectures	Exercises	
S-101	Mathematics I		45	45	**7**
S-102	Structural geometry		15	30	**4**
S-103	Physical Education I		0	30	**1**
S-104	English/German Language I		0	30	**2**
S-105	Fundamentals of Engineering Informatics I		15	15	**3**
S-106	Fundamentals of geology		30	0	**2**
S-107	Geodesy		30	30	**5**
S-108	Technical Drawing & CAD		0	30	**3**
S-109	Materials science		15	15	**3**
	Altogether				**30**

	II SEMESTER		**Hours**		**ECTS**
	Subject	Teacher	Lectures	Exercises	
S-201	Mathematics II		30	30	**5**
S-202	Physical Education II		0	30	**1**
S-203	Elements of high-rise construction		30	30	**5**
S-204	Mechanics		30	45	**6**
S-205	Hydrology		15	15	**3**
S-206	Fundamentals of Engineering Informatics II		15	15	**3**
S-207	Energy and Energy Efficiency in Buildings		30	15	**3**
S-208	Building regulations		30	0	**2**
S-209	English/German Language II		0	30	**2**
	altogether				**30**

	III SEMESTER		**Hours**		**ECTS**
	Subject	Teacher	Lectures	Exercises	
S-301	Physical Education III		0	30	**1**
S-302	Statics		30	45	**6**
S-303	Material resistance		30	45	**6**
S-304	Building materials		30	30	**5**
S-305	Hydromechanics		30	30	**5**
S-306	Soil mechanics		30	30	**5**
S-307	Environmental protection		30	0	**2**
	altogether				**30**

	IV SEMESTER		Hours		ECTS
	Subject	Teacher	Lectures	Exercises	
S-401	Physical Education IV		0	30	**1**
S-402	Fundamentals of Structural Engineering		30	30	**5**
S-403	Construction technology		45	45	**7**
S-404	Engineering Economics		30	30	**5**
S-405	Water supply and drainage		30	30	**5**
S-406	Geotechnical Engineering		30	30	**5**
S-407	Field instruction		0	30	**2**
	Altogether				**30**

	IN SEMESTAR		Hours		ECTS
	Subject	Teacher	Lectures	Exercises	
S-501	Fundamentals of wooden structures		30	30	**6**
S-502	Fundamentals of steel structures		30	30	**6**
S-503	Roads		30	30	**6**
S-504	Fundamentals of concrete structures		30	30	**6**
S-505	Construction Management		30	30	**6**
	Altogether				**30**

	VI SEMESTER		Hours		ECTS
Required subjects					
	Subject	Teacher	Lectures	Exercises	
S-601	Professional practice		15	120	**5**
S-602	Undergraduate Thesis		0	60	**5**
	altogether				**10**
Elective courses					
S-603	Building and finishing works		30	30	**5**
S-604	Road construction and maintenance		30	30	**5**
S-605	Construction business in a digital environment		15	30	**3**
S-606	Fundamentals of masonry structures		30	15	**3**
S-607	Home installations		15	30	**4**
S-608	Introduction to Geotechnical Design		15	30	**3**
S-609	Hydrotechnical structures		30	30	**5**
S-610	Management in construction		30	30	**5**
S-611	Contracting and planning the execution of construction projects		30	30	**5**
	altogether				**38***

* It is needed to choose 20 out of 38 possible points

3.2 Detailed description of all items

A detailed description of all subjects can be found in **Chapter 3.6** of the study program of the professional undergraduate study of Civil Engineering at the Faculty of Civil Engineering and Architecture Osijek.

3.3 Structure of the study

The professional study is structured in semesters and is organized in **6 semesters,** i.e. **3 years** of study. The content is structured through compulsory and elective content, i.e. compulsory and elective courses. Compulsory courses represent the necessary knowledge that introduces the student to the professional field of civil engineering, and in the total program they make up 80% of all ECTS credits of the study. Professional studies are also carried out for students in part-time status with an adjusted teaching schedule. **The prerequisites for enrolling in each course** are defined in the detailed description of each course.

3.4 Conditions for continuing studies after interruption

A student who has interrupted his/her studies may continue his/her studies in an extraordinary status, provided that the study programme has not been substantially changed (more than 20%) from the one the student was enrolled in. An applicant may apply for continuation of studies if no more than three years have elapsed since the last academic year of study enrolled and the application submission for continuation of studies. The application for the continuation of the interrupted study is submitted to the Faculty Committee for Student Affairs on a specially prescribed form of the Faculty of Civil Engineering and Architecture Osijek, with the appropriate documentation attached by the deadline for enrollment. The study continues based on the decision to continue the interrupted study, which is made by the Committee for Student Affairs in accordance with the study program. The decision lists the recognized exams with grades and the ECTS credits earned during the study, as well as differential and additional exams in accordance with the study program of the study holder in which the student continues his/her studies.

3.5 Partake

Students' knowledge is tested and assessed during classes, and the final grade is determined on the exam. Exams can be theoretical and practical, and are taken only orally, only written or written and oral or by presentation of practical work. If the exam consists of a written and an oral part, and the student has not passed the written part of the exam, he or she cannot take the oral part of the exam if the written part is eliminatory, per Table 1.

Table 1 – List of subjects with details of the implementation of the exam

Course	Semester	The subject exam consists of	The written part of the exam is eliminatory
Mathematics I	1	Written and oral exam	Yes
Construction geometry	1	Written and oral exam	Yes
Physical Education I	1	No exams	
English/German Language I	1	Written exam	
Fundamentals of Engineering Informatics I	1	Written exam	
Fundamentals of geology	1	Written exam	
Geodesy	1	Written and oral exam	Yes
Technical Drawing and AutoCAD	1	Written and oral exam	Yes

Materials science	1	Written and oral exam	Yes
Mathematics II	2	Written and oral exam	Yes
Physical Education II	2	No exams	
Elements of high-rise construction	2	Written and oral exam	Yes
Mechanics	2	Written and oral exam	Yes
Hydrology	2	Written and oral exam	Yes
Fundamentals of Engineering Informatics II	2	Written exam	
Energy and Energy Efficiency in Buildings	2	Written exam	
Building regulations	2	Viva voce	
English/German Language II	2	Written exam	
Physical Education III	3	No exams	
Statics	3	Written and oral exam	Yes
Material resistance	3	Written and oral exam	Yes
Building materials	3	Written and oral exam	Yes
Hydromechanics	3	Written and oral exam	Yes
Soil mechanics	3	Written and oral exam	Yes
Environmental protection	3	Written and oral exam	Yes
Physical Education IV	4	No exams	
Fundamentals of Structural Engineering	4	Written and oral exam	Yes
Construction technology	4	Written and oral exam	Yes
Engineering Economics	4	Written and oral exam	Yes
Water supply and drainage	4	Written and oral exam	Yes
Geotechnical Engineering	4	Written and oral exam	Yes
Field Instruction	4	No exams	
Fundamentals of wooden structures	5	Written and oral exam	Yes
Fundamentals of steel structures	5	Written and oral exam	Yes
Roads	5	Written and oral exam	Yes
Fundamentals of concrete structures	5	Written and oral exam	Yes
Construction Management	5	Written and oral exam	Yes
Professional practice	6	Written and oral exam	Yes
Undergraduate Thesis	6	No exams	
Building and finishing works	6	Written exam	Yes
Road construction and maintenance	6	Written and oral exam	Yes
Construction business in a digital environment	6	Written and oral exam	Yes
Fundamentals of masonry structures	6	Written and oral exam	Yes
Home installations	6	Written and oral exam	Yes
Introduction to Geotechnical Design	6	Written and oral exam	Yes
Hydrotechnical structures	6	Written and oral exam	Yes
Management in Construction	6	Written and oral exam	Yes
Contracting and planning the execution of construction projects	6	Written and oral exam	Yes

3.6 Detailed description of all items

GENERAL INFORMATION		
Course Holder	mr. sc. Josipa Matotek	
The name of the college	Mathematics I	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	I. / I.	
Point value and method of teaching	ECTS coefficient of student workload	7,0
	Number of hours (P+V+S)	45+45+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to help students master the basic concepts in the field of linear algebra fundamentals, elementary functions, and differential calculus and its applications. Furthermore, the goal is to develop skills and abilities to identify, formulate and solve simpler, but also more difficult problems in these areas, using the synthesis of theoretical knowledge by applying them to tasks. The emphasis is on the development of logical thinking, reasoning and generalizing skills.

1.2. Requirements for enrolment in the course

Lacks

1.3. Expected learning outcomes for the course

1. Distinguish and explain basic concepts from the basics of linear algebra (vectors, operations with vectors, matrices, determinants).
2. Apply vector calculus in the calculation of surfaces, volumes and equations of lines and planes in space, noticing their mutual relationships.
3. Calculate the solutions of a system of linear equations using matrices.
4. Distinguish between sets of numbers, elementary functions, analyze their basic properties and types of representation.
5. Explain the concept of derivation and derive real functions.
6. Sketch graphs of functions using differential calculus and properties of elementary functions.

1.4. Course content

Sets of numbers and their properties. Intervals. Subset, union, and intersection of sets. The concept of vector. Length and direction of the vector, unit vector, radius vector. collinear and complanar vectors. Equality of vectors. Addition of vectors and multiplication of vectors by a scalar. Vector space. Linear combination of vectors, base v.p. Scalar product and applications. Determinants of the 2nd and 3rd order. Vector product and applications. Mixed and multiple product and applications. Directions and planes in space. The concept of function. Composition of functions, inverse function. Elementary functions with basic properties and graphs: constant, linear and quadratic functions, powers, polynomials, rational and irrational functions. Exponential and logarithmic functions. Trigonometric and arcus functions. The concept of a string and the limits of a string. A single limits, a single limit. Continuous functions. the asymptote function. The concept of derivative. Tangent to the graph of the function. Derivative of elementary functions. Rules of derivation. Higher-order derivatives. Derivative of implicitly and parametrically given functions. The basic theorems of differential calculus. Applications of calculus: Indefinite expressions and L'Hospital's rules. Examination of the course of the function and sketching of the graph of the function: monotony and local extremes; concavity, convexity and inflection. The concept of matrices and operations with matrices. Regular matrices. Rank of the matrix. Systems of equations, Kronecker-Capelli theorem, Gaussian method of elimination.

1.5. Types of teaching (put X)	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work

1.6. Student obligations

Regular attendance, active participation in classes (regular keeping of class notes in notebooks), solving homework

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity		Seminar paper		Experimental work	
Written exam	x	Viva voce	x	Assay		Research	
Project		Continuous Knowledge Assessment	x	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending classes	3,0	1-6	Oral and written presentation and problem solving with the use of multimedia.	Signing, a condition for obtaining a certificate of attendance in the ISVU system	0	0
Continuous Examination / Written and Oral Exam	4,0	1-6	Colloquium or exam (written and oral)	Verification of the accuracy of the procedure and solution of tasks	50%	100%

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
D. Jukić, R. Scitovski: Mathematics I, J. J. Strossmayer University of Osijek, Osijek, 2000 (online version: http://www.mathos.unios.hr/diferencijalni/Jukic_Scitovski.pdf)	11	40

1.10. Supplementary literature

Slapničar: Mathematics I, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture in Split, Split, 2002 (online version: http://lavica.fesb.hr/mat1/)

B. P. Demidovič: Tasks and solved examples from higher mathematics with application to technical sciences, Tehnička knjiga, Zagreb, 2003.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	Anamarija Štefić, prof.	
The name of the college	English Language I	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 1.	
Point value and method of teaching	ECTS coefficient of student workload	2,0
	Number of hours (P+V+S)	0+30+0

DESCRIPTION OF THE COURSE		
1.1. Objectives of the course		
• introduce students to the grammatical and linguistic structures inherent in technical English • get to know the peculiarities of a professional text • adopt and expand the professional terminology of the basic areas of the profession • develop reading and comprehension skills of a professional text and coping with dictionaries • develop translation skills into and from English		
1.2. Requirements for enrolment in the course		
-		
1.3. Expected learning outcomes for the course		
1. read and understand a short professional text 2. analyze the read text in various forms of written communication 3. analyze the read text in various forms of oral communication 4. define and classify terms from the profession 5. apply the processed professional terminology 6. apply grammatical constructions in written text and oral communication		
1.4. Course content		
• Introduction (2) • Architect Imhotep (2) • The Great pyramid of Cheops (2) • The Majestic Taj Mahal (2) • Astonishing Cathedrals (2) • Steel and structures never possible before (4) • What is Civil Engineering? (2) • Structural engineering (4) • Petronas Twin Towers (2) • Revision / Grammar (6) • Preliminary exams (2)		
1.5. Types of teaching (put X)	☐ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work
1.6. Student obligations		

Regular attendance at exercises.
Active participation in discussions.
Regular solving of grammar and vocabulary exercises.
Written translation of assigned professional texts.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper		Experimental work	
Written exam	x	Viva voce		Assay		Research	
Project		Continuous Knowledge Assessment	x	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attendance and activity in class	1,0	1, 2, 3, 5, 6	Oral and written presentation, solving tasks and translating texts, discussion and discussion on a given topic	Recording attendance, questions, checking assignments and written translations	25	50
Continuous Examination / Final Exam	1,0	1, 2, 3, 4, 5, 6	Solving tasks, translation, discussion	Review of the written examination, evaluation of answers	25	50

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Kraljević, L.: "Structures in Time & Space I", Faculty of Civil Engineering Osijek, J. J. Strossmayer University of Osijek, Osijek, 2002.	60	60

1.10. Supplementary literature

Kralj Štih, A: English in Civil Engineering, Hrvatska sveučilišna naklada, Zagreb, 2004.
Hercezi – Skalicki, M.: Reading Technical English for Academic Purposes, Školska knjiga, Zagreb, 1993.
Bujas, Ž.: The Great English – Croatian Dictionary, Globus Publishing House, Zagreb, 1999.
Bujas, Ž: The Great Croatian-English Dictionary, Globus Publishing House, Zagreb, 1999.
Prager, A: Trilingual Construction Dictionary, Masmedia, Zagreb, 2003.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.
Feedback from students.
Evaluation of students in exams.

GENERAL INFORMATION		
Course Holder	mr. sc. Vladimir Moser	
The name of the college	Geodesy	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 1.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE
1.1. Objectives of the course
Acquiring knowledge of the basics of geodetic activity with special emphasis on application in construction.
1.2. Requirements for enrolment in the course
Lacks
1.3. Expected learning outcomes for the course
1. explain the concept of geodesy, and all its activities and applications 2. explain the shapes of the Earth and different coordinate systems 3. explain the methods of satellite geodesy with their applications 4. explain the types of cartographic projections and maps 5. explain the types and purpose of horizontal and elevation grids 6. explain the methods of horizontal and height measurement 7. Explain the basic concepts of photogrammetry and its application. 8. explain the types of staking and their application in construction
1.4. Course content
Lectures: Definition of Geodesy and Historical Overview (2 hours) Division of geodesy (satellite, physical, applied geodesy) (2 hours) Coordinate systems and cartographic projections (2 hours) Horizontal and Elevation Geodetic Networks (4 hours) Geodetic instruments (theodolite, leveler and rangefinder) (4 hours) Measuring length (2 hours) Horizontal survey methods (orthogonal, polar, GPS method) (2 hours) Altitude survey methods (barometric, geometric, trigonometric, hydrostatic and GPS) (2 hours) Photogrammetry (2 hours) Maps (2 hours) Methods of horizontal and height staking and applications in construction (4 hours) Fundamentals of Error Theory (2 hours) **Exercises:** Solving 4 computational geodetic tasks (auditory and construction exercises) (18 hours) Field geodetic measurements (measurement of angles, lengths and altitude differences, basics of GPS satellite method, creation of a geodetic base) (8 hours) 2 colloquia (4 hours)

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

1.6. Student obligations

Compulsory attendance of classes, lectures and exercises.
4 geodetic tasks were solved during the exercises.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity		Seminar paper		Experimental work	
Written exam	x	Viva voce	x	Assay		Research	
Project		Continuous Knowledge Assessment	x	Report		Practical work	x

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Praise for teaching	2,0	1-8	Oral presentation	Recording attendance	5	20
Practical calculation tasks	1,0	4, 5	Solving tasks	Overview of tasks	10	20
Written exam	1,0	1-8	Colloquiums	Overview of the colloquium	20	40
Viva voce	1,0	1-8	Conversation and discussion		10	20

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Pribičević, B., Medak, D. (2003): Geodesy in Civil Engineering, VBZ, Zagreb	10	60
Macarol, S. (1985): Practical Geodesy	6	60

1.10. Supplementary literature

Kapović, Z. (2010): Geodesy in Civil Engineering; Faculty of Geodesy, Zagreb
Feil, L. (1989): Error Theory I, Faculty of Geodesy, Zagreb
Janković, M. (1982): Engineering Geodesy Part I, SNL, Zagreb
Janković, M. (1981): Engineering Geodesy Part II, SNL, Zagreb

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

During the classes, two colloquia with theoretical questions are conducted, while 4 geodetic tasks are solved in the exercises for the purpose of continuous quality monitoring.

GENERAL INFORMATION		
Course Holder	dr. sc. Darija Marković	
The name of the college	Construction geometry	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	I. / 1.	
Point value and method of teaching	ECTS coefficient of student workload	4,0
	Number of hours (P+V+S)	15+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Students will be introduced to projection methods such as the method of orthogonal projection, axonometric methods and the method of dimensioned projection with the aim of representing 3-dimensional objects in the plane of drawing and vice versa, learn how to perceive an object in space from a drawing, draw conclusions about the relationships and sizes of the depicted objects and develop spatial vision, logical thinking and reasoning.

1.2. Requirements for enrolment in the course

Lacks.

1.3. Expected learning outcomes for the course

1. Determine the positional and metric relationships of geometric objects and discuss them.
2. Depict a regular geometric solid in orthogonal and oblique projection.
3. Apply the methods of oblique projection on a wooden berth.
4. Determine the cross-section of the body by the plane.
5. Solve a simple road in a quoted projection.

1.4. Course content

Elementary constructions. Curve constructions of the 2nd degree. Prospective collineation in the plane. Prospective affinity in the plane. Monge orthogonal projection. Side plan. A foreign outline. Rotation. Projections of geometric solids. Axonometric methods. Eckhart's procedure. Quoted projection. Contour Method and Application.

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

1.6. Student obligations

Regular attendance at classes (lectures and exercises).
Development of semester programs.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper		Experimental work	
Written exam	x	Viva voce	x	Assay		Research	

Project		Continuous Knowledge Assessment	x	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending Nasava	1,5	1, 2, 3, 4, 5	Oral and written presentation	Recording attendance	7	10
Teaching activity	0,5	1, 2, 3, 4, 5	Conversation, discussion	Questions during the processing of a new topic and the execution of structures	10	20
Written exam / Continuous examination of knowledge	1,5	1, 2, 3, 4, 5	Solving tasks	Review of the written examination	20	45
Oral exam / Continuous assessment	0,5	1, 2, 3, 4, 5	Conversation and discussion/ written answers to questions	Evaluation of responses	13	25

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Structural Geometry (2022) - Ivanka Stipančić-Klaić	29	60
Descriptive Geometry: Tasks (2007) - Ana Sliepčević, Ivanka Babić, Sonja Gorjanac, Vlasta Szirovicza	11	60

1.10. Supplementary literature

Descriptive Geometry (2005) - Vlasta Szirovicza, Ema Jurkin
https://www.grad.hr/geometrija/udzbenik/index.html - online textbook for the courses Descriptive Geometry and Perspective at the Faculty of Civil Engineering, University of Zagreb

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	Anamarija Štefić, Prof.	
The name of the college	German Language I	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 1.	
Point value and method of teaching	ECTS coefficient of student workload	2,0
	Number of hours (P+V+S)	0+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

- to introduce and remind students of the grammatical and linguistic structures that are inherent in the technical German language
- get to know the peculiarities of a professional text
- adopt and expand the professional terminology of the basic areas of the profession
- develop reading and comprehension skills of a professional text
- develop the skills of translating simpler professional texts into and from German

1.2. Requirements for enrolment in the course

-

1.3. Expected learning outcomes for the course

1. read and understand a short professional text
2. analyze the read text in various forms of written communication (answer questions, complete sentences, group concepts, formulate a summary text in writing)
3. analyze the read text in different forms of oral communication (short discussions on a given topic, work in pairs/groups)
4. define and classify terms from the profession
5. describe materials and their properties
6. apply the processed professional terminology
7. apply grammatical constructions in written text and oral communication

1.4. Course content

- Allgemeines zum Bauwesen (4)
- Baustelle (4)
- Bauholz (4)
- Concrete hat viele Gesichter (4)
- Stahlbau (4)
- Supergras Bamboo (2)
- Lehm (4)
- Colloquiums (4)

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

1.6. Student obligations

Regular attendance at exercises.
Active participation in discussions.
Regular solving of grammar and vocabulary exercises.
Written translation of assigned professional texts.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper		Experimental work	
Written exam	x	Viva voce		Assay		Research	
Project		Continuous Knowledge Assessment	x	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending exercises and being active in class	1,0	1, 2, 3, 6, 7	Oral and written presentation, solving tasks and translating texts, discussion and discussion on a given topic	Recording attendance, questions, checking assignments and written translations	25	50
Continuous Examination / Final Exam	1,0	1, 2, 4, 5, 6, 7	Solving tasks, translation, discussion	Review of the written examination, evaluation of answers	25	50

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Štefić, Anamarija (2015) Deutsch im Bauwesen, Josip Juraj Strossmayer University of Osijek, Faculty of Civil Engineering Osijek, Osijek	10	10

1.10. Supplementary literature

- King Trick, Alemka (2005). Deutsch im Bauingenieurwesen, Croatian University Press, Zagreb
- Ritoša, M. – V. Sekula (1989.) German for Civil Engineers, School of Foreign Languages, Zagreb
- Tecilazić, Franci (1986.) Deutsch für Studenten der Architektur, Faculty of Architecture, University of Zagreb, Zagreb
- Prager, A: "Trilingual Construction Dictionary", Masmedia, Zagreb, 2003.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.
Feedback from students.
Evaluation of students in exams.

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Jasna Kopić	
The name of the college	Engineering Geology	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 1.	
Point value and method of teaching	ECTS coefficient of student workload	2,0
	Number of hours (P+V+S)	30+0+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to introduce students to geosciences and the origin of the Earth and its current state. Rocks will be classified according to their composition and method of origin and put in the context of their application in construction. Types of geological structures will be singled out, the geological map will be interpreted. Also, students will be introduced to endodynamic and exodynamic processes and phenomena and problems that can affect the performance of engineering objects.

1.2. Requirements for enrolment in the course

No prerequisites

1.3. Expected learning outcomes for the course

1. Distinguish between different types of rocks and minerals
2. Distinguish between different types of geological structures
3. Explain certain surface processes and consequences
4. Predict geological problems in construction

1.4. Course content

Introduction to Geology, Origin and Structure of the Earth (2 hours)
Crystallography. Mineralogy. Systematics of minerals (4 hours)
Petrology and Petrography (igneous, metamorphic and sedimentary rocks) (4 hours)
Geological Structures and Geological Map (2 hours)
Stratigraphic Geology (1 hour)
Modern Endodynamic Processes with Examples (3 hours)
Contemporary Exodynamic Processes and Phenomena with Examples (4 hours)
Introduction to Hydrogeology, Hydrological Cycle, Mode of Occurrence of Water in the Underground (2 hours)
Research Methods and Application of Results in Construction (8 hours)

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

1.6. Student obligations

Students are required to attend classes and complete assignments while passing colloquiums and final exams

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper		Experimental work	
Written exam	x	Viva voce		Assay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Praise for teaching and activity in teaching	1,0	1,2,3,4	Oral presentation, discussion, discussion, group discussion	Recording attendance, questions during the processing of a new topic	7	10
Written exam	1,0	1,2,3,4	Solving tasks	Review of the written examination	15	30

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Vazdar, T. (2010): Geology for Civil Engineers, Faculty of Civil Engineering and Architecture, University of Split	20	60
Šestanović, S.(2001): Basics of Geology and Petrography, Faculty of Civil Engineering and Architecture in Split,	5	60
Šestanović, S. (1993): Basics of Engineering Geology of Applications in Construction, Faculty of Civil Engineering and Architecture in Split,	5	60

1.10. Supplementary literature

Plummer, Ch.C., McGeary, D. & Carlson, D. (2001): Physical Geology, 8th Ed., Mc Graw Hill, Boston.
Urumović, K. (2000): Physical Basis of Groundwater Dynamics, Faculty of Mining, Geology and Petroleum Engineering, Zagreb

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.
Results of exam success analyses (passing at colloquiums and exams)
Results of attendance of lectures

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Mario Jeleč	
The name of the college	Fundamentals of Engineering Informatics I	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	I. / 1.	
Point value and method of teaching	ECTS coefficient of student workload	2,0
	Number of hours (P+V+S)	15+10+5

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Become familiar with the principles of working on a computer in performing office and other everyday tasks during and after study. Acquire the skill of handling the basic office software package MS Office (or similar), i.e. its modules word processor, spreadsheets and presentations.

1.2. Requirements for enrolment in the course

There are no conditions.

1.3. Expected learning outcomes for the course

1. Define the purpose and application of standard office tools (word processors, spreadsheets).
2. Create text files and apply different types of formatting, content creation options and other lists in document and review tool.
3. Create a spreadsheet file and apply cell formatting, simple aggregate functions, and conditional formatting.
4. Create a presentation file and apply different templates, format individual slides and define different Animations on elements and transitions between slides

1.4. Course content

Introduction to the College. The basics of digital recording and working with them. Introduction to office programs with a demonstration of basic work and solutions
Examples. Basic work with MS Word - word processing, creating tables, reviews. Basic work with the MS application PowerPoint - formatting and creating charts using basic functions. Basic work with MS Excel - use complex functions. Repetition and preparation with recapitulation of the material.

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

1.6. Student obligations

Regular attendance at lectures and exercises, active participation in classes and preparation of seminar papers.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper	X	Experimental work	
Written exam	X	Viva voce		Assay		Research	

Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending classes	1,0	1, 2, 3, 4	Oral and written presentation	Recording attendance	0	0
Teaching activity	0,1	2, 3, 4	Conversation, discussion and group discussions	Questions during the processing of a new topic	0	5
Seminar paper	0,3	2, 3, 4	Solving tasks	Review of written assignments and seminar paper	10	15
Written exam*	0,6	1, 2, 3, 4	Solving tasks	Review of the written examination	50	100
Continuous Knowledge Assessment	0,6	1, 2, 3, 4	Solving tasks	Review of the written examination	40	80

*if the student is not exempt from the written part of the exam through a continuous knowledge test

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Lectures on the course website		
Šimović, Vladimir, Franjo Maletić, Winton Afrić. Fundamentals of Computer Science - Introduction. Zagreb: Golden marketing - Tehnička knjiga, Faculty of Teacher Education, University of Zagreb, 2010		
Nadrljanski, Đorđe, Nadrljanski Mila. Basics of informatics. Split: Faculty of Humanities and Social Sciences, University of Split. 2007		

1.10. Supplementary literature

Sagman, Steve. Microsoft Office for Windows. Zagreb: Miš d.o.o., 2004
Microsoft Office User Guide

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

The work of students is monitored through the regularity of attendance at lectures and exercises, activity in class, accuracy of the preparation of the seminar paper and written exam/continuous examination of knowledge. The results of the activities are evaluated through a system of scoring and evaluation with criteria.

GENERAL INFORMATION		
Course Holder	Prof. Dr. Sc. Ivana Miličević	
The name of the college	Materials science	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	I. / 1.	
Point value and method of teaching	ECTS coefficient of student workload	3,0
	Number of hours (P+V+S)	15+15+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

To teach students to examine and calculate properties
materials and in accordance with the results obtained, understand the application of a certain material in construction.
Specific
Competencies would be developed within the framework of individual tasks in laboratory exercises.

1.2. Requirements for enrolment in the course

There are no conditions for enrollment.

1.3. Expected learning outcomes for the course

1. enumerate and recognize the properties of materials
2. Examine and calculate the properties of materials
3. evaluate the advantages and disadvantages of applying materials in certain conditions
4. understand the application of materials in the building in accordance with the obtained properties

1.4. Course content

Introductory Information on Building Materials (1 hour)Physical Parameters of Materials (1 hour)Properties of Engineering Materials and Their Application (1 hour)
Surface properties: surface tension, adsorption, capillary phenomena. (1 hour)
Other important physical properties (1 hour)Bonds between atoms. Development of microstructure (1 hour)Thermal, acoustic and optical properties of materials (1 hour)
Chemical Aspects of the Material (1 hour)Mechanical Properties of Materials (1 hour)
Material testing. Statistical Processing (1 hour)Fracture Mechanics (1 hour) Fluid and Fluid Rheology (1 hour)Material Fatigue (1 hour)Material Durability (1 hour)Technical Regulation and Legislation (1 hour)

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

1.6. Student obligations

Regular attendance at lectures and exercises.
Completed and submitted laboratory exercise forms.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	X
Written exam	X	Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending classes	1,0	1 to 4	Oral and written presentation	Recording attendance	7	10
Teaching activity	0,25	1 to 4	Conversation, solving a semester assignment	Semester Assignment Review	3	10
Experimental work	0,25	2, 3	Independently conducting tests in the laboratory and solving tasks	Overview of Lab Exercise Patterns	10	20
Written exam / Continuous examination of knowledge	0,5	1 to 4	Solving tasks	Review of the written examination	15	30
Viva voce	1,0	1 to 4	Conversation and discussion	Evaluation of responses	15	30

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Mikoč, M., Building Materials, Faculty of Civil Engineering, University of Osijek, Osijek, 2006.	10	60
Bjegović, D., Štirmer, N., Theory and Technology of Concrete, Faculty of Civil Engineering, University of Zagreb, Zagreb, 2015.	20	60
Netinger, I.; Miličević, I., Collection of solved problems from Material, Faculty of Civil Engineering Osijek, Osijek, 2014.	20	60

1.10. Supplementary literature

Illston, J. M.; Domone, P. L. J.: Construction Materials: Their Nature and their Behaviour, 4th Edition. New York: Clip Press, 2010.
Ashby, Michael F.; Joneas David R, H.; Engineering Materials 1, Butterworth-Heinemann, Oxford - Boston - Johannesburg - Melbourne - New Delhi - Singapore, 1996.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	mr. sc. Vladimir Moser	
The name of the college	Technical Drawing & CAD	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 1.	
Point value and method of teaching	ECTS coefficient of student workload	3,0
	Number of hours (P+V+S)	0+30+0

DESCRIPTION OF THE COURSE		
1.1. Objectives of the course		
Familiarization with the elements of technical drawing. Introduction to the basic documents of physical planning. Introduction to the levels and basic content of the project documentation. Learning and applying a software package for drawing in 2D.		
1.2. Requirements for enrolment in the course		
Lacks		
1.3. Expected learning outcomes for the course		
1. Analyze the key elements of a technical drawing 2. Make technical drawings in accordance with technical standards. 3. Apply CAD 2D to draw, edit and print technical drawings, while respecting technical norms and standards. 4. Distinguish between levels and contents of project documentation.		
1.4. Course content		
Accessories for technical drawing, types and sizes of paper (2 hours) Drawing scale, computational examples (2 hours) Introduction to different blueprints and projects, bending blueprints (2 hours) Colloquium I (2 hours) Introduction to AutoCAD, preparation for drawing (2 hours) Assigning data, drawing basic graphic elements (2 hours) Edit Commands (2 hours) Drawing a Drawing Template 1 Drawing data, text, hatching (2 hours) Complex Objects (Polyline and Block), Drawing Drawing Template 2 (2 hours) Dimensioning of drawings (2 hours) Print a drawing, draw a drawing template 3 (2 hours) Drawing complex drawings (2 hours) Colloquium II (2 hours) Correction of Colloquium I and II (2 hours)		
1.5. Types of teaching (put X)	☐ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☒ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____

1.6. Student obligations

Compulsory attendance at classes.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper		Experimental work	
Written exam	x	Viva voce	x	Assay		Research	
Project		Continuous Knowledge Assessment	x	Report		Practical work	x

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending classes	1,0	1-3	Oral presentation	Recording attendance	5	20
Practical work	0,5	3	Drawing assignments	Overview of tasks	10	20
Written exam	1,0	1-3	Colloquiums	Overview of the colloquium	10	40
Viva voce	0,5	3	Conversation and discussion		10	20

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Ištoka Otković, Irena; Koški, Željko; Zagvozd, Martina. Technical drawing with the application of AutoCAD. Osijek: Faculty of Civil Engineering, J.J. Strossmayer University of Osijek, 2015.	10	60
Klem, Nikola; Koški, Željko; Ištoka Otković, Irena. Technical Drawing and CAD, Faculty of Civil Engineering, Osijek, 2008	10	60

1.10. Supplementary literature

Trconić, Margareta. Technical Drawing with Examples of Technical Drawings, Vinkovci, 2007
Vrkljan, Zvonimir. Construction Drawings Equipment, Zagreb, 1986

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

During the classes, two colloquiums are conducted. On colloquium I there are theoretical questions in the field of technical drawing, while on colloquium II there is practical drawing of the floor plan of a family house.

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Hrvoje Ajman	
The name of the college	Physical Education I	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 1. semester	
Point value and method of teaching	ECTS coefficient of student workload	1,0
	Number of hours (P+V+S)	0+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Satisfying one of the primary human needs, movement. Determining the current state of students and intervening on this condition by adding new motor skills, nurturing and repeating already acquired motor skills, and harmonious and moderate development in the field of motor achievements and functional abilities.

1.2. Requirements for enrolment in the course

-

1.3. Expected learning outcomes for the course

1. Apply ways of preserving health through PE teaching programs.
2. Encourage responsibility and independence.
3. Demonstrate work on devices for the development of motor skills.
4. Use healthy work and hygiene habits.

1.4. Course content

Kinesiology, Physical and Health Education, Kinesiological Recreation, Sport and Methodology of Sports Training, Kinesitherapy, Subject of Research and Structure of Kinesiology, Structure of Anthropological Space, Health Status, Functions of the Respiratory and Circulatory System.
Assessment of functional abilities and measuring instruments, Assessment of motor skills and measuring instruments, Assessment of morphological characteristics and measuring instruments, Planning and programming of transformation processes, Locomotor system - role of muscles and physiology of body posture, Assessment and evaluation of cumulative effects of recreational exercise programs, Basic methods of aerobic exercise, Basic methods of anaerobic exercise, Models of various sports and recreational programs.

1.5. Types of teaching (put X)	☐ lectures	☒ Independent tasks
	☒ exercises	☐ Multimedia & Network

1.6. Student obligations

Attending classes and participating in sports competitions.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max

		OUTCOME				
Attending classes	1,0	1, 2, 3, 4	Exercises	Task Execution Records and Attendance Records	-	-

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Vukić, Ž., S. Jančić: Handbook for Independent Targeted Training of Students, Osijek, 1999.		40

1.10. Supplementary literature

Mraković, M.: Introduction to Systematic Kinesiology, Zagreb, 1997.
Milanović, D.: Diagnostics in Sport, Rovinj, 1996.
Andrijašević, M.: Sports Recreation in the Place of Work and Residence, Zagreb, 1996.
Horga, S.: Psychology of Sport, Zagreb, 2009.
Rastovski, D.: How to Swim, Osijek, 2016.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Task execution records and attendance records. Assessment and assessment of the initial state. Evaluation of the immediate and cumulative effects of exercise.

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Danijela Lovoković	
The name of the college	Elements of high-rise construction	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 2. semester	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE		
1.1. Objectives of the course		
The aim of the course is to introduce students to the basic elements of buildings and the ways of displaying these elements in different types of projects.		
1.2. Requirements for enrolment in the course		
No conditions		
1.3. Expected learning outcomes for the course		
1. Identify the basic elements of a building in different types of projects. 2. Define and analyze the structures of the basic elements of a building. 3. Recognize the role of load-bearing and non-load-bearing elements in the building. 4. Draw parts of the preliminary, main and detailed design of simple buildings. 5. Use different building projects in professional work.		
1.4. Course content		
Introduction (actions on buildings, types of building elements and structural systems, types of projects) – 2 hours; Foundation and waterproofing – 2 hours; Walls and columns (brick, stone, concrete and reinforced concrete; arches, lintels and cerclages, chimneys and ventilation) – 6 hours; Massive and lightweight mezzanine load-bearing structures – 4 hours 1st colloquium – 2 hours; Massive and light staircases – 2 hours; Flat and pitched roofs and cover - 3 hours; Partition walls – 1 hour; Windows and doors - 2 hours; Finishing floors and ceilings - 2 hours; Thermal insulation and façade cladding – 2 hours 2nd colloquium - 2 hours. Exercises – program development – 30 hours.		
1.5. Types of teaching (put X)	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____

1.6. Student obligations

Regular attendance at lectures and exercises, independent creation of two programs, written exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper		Experimental work	
Written exam	x	Viva voce		Assay		Research	
Project	x	Continuous Knowledge Assessment	x	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attendance and activity in class	2,0	1, 2, 3, 4, 5	Conversation, discussion	Recording attendance	3	10
Project	1,0	1, 2, 3, 4, 5	Solving the task, discussions, creating a project	Review and evaluation of the project	16	30
Continuous examination of knowledge (colloquium or written exam)	2,0	1, 2, 3, 4, 5	Solving a task, answering written questions	Review and Assessment of the Written Examination	32	60
					51	100

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Ž. Koški, N. Bošnjak, I. Brkanić: Elements of Building Construction I, J.J. Strossmayer University of Osijek - Faculty of Civil Engineering Osijek, Osijek, 2012 (internal script)	online	40
Ž. Koški, V. Slabinac, D. Stober, N. Bošnjak, I. Brkanić: Elements of Building Construction II, J.J. Strossmayer University of Osijek - Faculty of Civil Engineering Osijek, Osijek, 2013 (internal script)	online	40

1.10. Supplementary literature

Ištoka Otković, I., Koški, Ž., Zagvozda, M.: Technical Drawing with the Application of AutoCAD, Faculty of Civil Engineering, J.J. Strossmayer University of Osijek, Osijek, 2015.
Neufert, E.: Elements of Architectural Design, Goldeng Marketing, Zagreb, 2002.
Peulić, Đ.: Constructive Elements of Buildings, UPI-2M plus, Zagreb, 2013.
Richarz, C., Schulz, C., Zeitler, F.: Energy-Efficiency Upgrades (Detail Practice), Birkhäuser Architecture, 2003.
Štulhofer, A., Veršić, Z.: Drawing Architectural Designs: Accessories and Basics, UPI-2M, d.o.o., Zagreb, 1998.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.
Evaluation of students' success in the development of the given program and in the written exam.
Feedback from students during and after class.

GENERAL INFORMATION		
Course Holder	Prof. Dr. Sc. Hrvoje Krstić	
The name of the college	Energy and Energy Efficiency in Buildings	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 2.	
Point value and method of teaching	ECTS coefficient of student workload	3,0
	Number of hours (P+V+S)	30+15+0

DESCRIPTION OF THE COURSE		
1.1. Objectives of the course		
Describe the basic principles of building physics. Define energy consumption in buildings. Describe the energy efficiency in the construction. Identify energy saving opportunities in buildings. Recognize the applicable legal regulations that govern energy efficiency in buildings. Explain the concept of a nearly zero-energy building. To get acquainted with laboratory and in situ measurements in the field of energy efficiency in buildings.		
1.2. Requirements for enrolment in the course		
There are no additional conditions.		
1.3. Expected learning outcomes for the course		
1. Describe the basic concepts in the field of building physics. 2. Identify the technical systems of the building that consume energy. 3. Define the value of the heat transfer coefficient. 4. Interpret the concept of a nearly zero-energy building. 5. Apply the basic procedures for calculating heat losses and water vapor diffusion in building elements.		
1.4. Course content		
The subject of research and goals of building physics. (2 hours) Basic concepts and physical quantities of the science of heat. (4 hours) Energy transmission modes. Convective heat transfer equations. (4 hours) Renewable energy sources. (2 hours) Energy for the operation of technical systems in the building. (2 hours) The coefficient of thermal conductivity of building materials. (2 hours) Thermal insulation of building elements. Calculation of the value of the heat transfer coefficient. (4 hours) The heat transfer coefficient for the entire structure. Temperature curve. (5 hours) Thermal bridges. Heat accumulation. (4 hours) Properties of humid air. Condensation of water vapor. Diffusion of water vapor through building elements. (2 hours) The effect of solar radiation on building elements. Temperature work and temperature stresses. (2 hours) Basic principles of designing nearly zero-energy buildings. (4 hours) Acoustics. Physical properties of sound. Noise. (2 hours) Lighting. Thermal comfort of the interior space. (2 hours) Laboratory and in situ measurements in the field of energy efficiency in buildings. (4 hours)		
1.5. Types of teaching (put X)	☒ lectures ☐ seminars and workshops ☒ exercises	☒ Independent tasks ☐ Multimedia & Network ☒ laboratory

	☐ Distance education ☐ Field Teaching	☐ Mentoring work ☐ Other_____

1.6. Student obligations

Regular attendance at lectures and exercises.
Active participation in discussions.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	
Written exam	X	Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending classes	1,5	1, 2, 3, 4	Oral and written presentation	Recording attendance		
Teaching activity	0,5	1, 2, 3, 4	Conversation, discussion, group discussion	Questions during the processing of a new topic		
Written exam / Continuous examination of knowledge	0,5	1, 2, 3, 4, 5	Solving tasks	Review of the written examination	25	50
Viva voce	0,5	1, 2, 3, 4, 5	Conversation and discussion	Evaluation of responses	25	50

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Construction Act	Unlimited	40
Technical regulation on the rational use of energy and thermal protection in buildings	Unlimited	40
Energy Efficiency Act	Unlimited	40
Guidelines for nearly zero-energy buildings	Unlimited	40
Methodology for conducting an energy audit of buildings	Unlimited	40

1.10. Supplementary literature

Pinterić, M. Building physics: from physical principles to international standards, Cham, Springer, cop. 2017.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	Anamarija Štefić, prof.	
The name of the college	English Language II	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 2.	
Point value and method of teaching	ECTS coefficient of student workload	2,0
	Number of hours (P+V+S)	0+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

- Acquire and expand vocabulary related to construction
- Identify and use technical terminology.
- adopt reading and listening strategies, receiving and giving information
- master the more complex grammatical structures inherent in technical German
- develop oral communication in the field of profession

1.2. Requirements for enrolment in the course

Previous course in English Language and

1.3. Expected learning outcomes for the course

1. Analyze a professional text (vocabulary and grammar) from the areas listed in the lecture content
2. Interpret tables and figures
3. Use appropriate professional terminology and phrases in written and oral communication
4. Analyze and summarize the textual content, extracting key arguments and definitions and structure them in writing in a clear and logical format.
5. Paraphrase and interpret key parts of a text orally, adapting the content to the specific goals and context of the communication.
6. Translate simpler professional texts into or from English, while maintaining the precision and clarity of professional terminology.

1.4. Course content

- Structural Engineering (4)
- Dams – Lords of Water (2)
- Examples of dams (4)
- Imposing Bridges (2)
- Examples of Bridges (4)
- Canals & Aqueducts (4)
- Tunnels (4)
- Revision (2)
- Preliminary Exams (4)

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

1.6. Student obligations

Regular attendance at exercises.
Active participation in discussions
Regular completion of grammar and vocabulary exercises
Written translation of assigned professional texts.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper		Experimental work	
Written exam	x	Viva voce		Assay		Research	
Project		Continuous Knowledge Assessment	x	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending exercises and being active in class	1,0	1,2,3,4, 5,6	Oral and written presentation, solving tasks and translating texts, discussion and discussion on a given topic	Recording attendance, questions, checking assignments and written translations	25	50
Continuous Examination / Final Exam	1,0	1,3,4,6	Solving tasks, translation, discussion	Review of the written examination, evaluation of answers	25	50

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Kraljević, L.: "Structures in Time & Space I", Faculty of Civil Engineering Osijek, J. J. Strossmayer University of Osijek, Osijek, 2002.	60	60

1.10. Supplementary literature

Kralj Štih, A: "English in Civil Engineering", Hrvatska sveučilišna naklada, Zagreb, 2004.
Hercezi – Skalicki, M.: 'Reading Technical English for Academic Purposes', Školska knjiga, Zagreb, 1993.
Bujas, Ž.: 'The Great English – Croatian Dictionary', Globus Publishing House, Zagreb, 1999.
Bujas, Ž: 'The Great Croatian-English Dictionary', Globus Publishing House, Zagreb, 1999.
Prager, A: "Trilingual Construction Dictionary", Masmedia, Zagreb, 2003.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.
Feedback from students.
Evaluation of students in exams.

GENERAL INFORMATION		
Course Holder	dr.sc. Držislav Vidaković	
The name of the college	Building regulations	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 2.	
Point value and method of teaching	ECTS coefficient of student workload	2,0
	Number of hours (P+V+S)	30+0+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to familiarize students with the basic laws and bylaws governing the field of construction: rights, powers and responsibilities of participants in construction, harmonization of the interests of participants in construction with public interests, quality of contracted works, public procurement, safety of human life and health, environmental protection and other technical, legal, economic and financial issues related to construction.

1.2. Requirements for enrolment in the course

Lacks.

1.3. Expected learning outcomes for the course

1. Interpret legal and by-laws relevant to the construction phase.
2. Apply the prescribed measures to carry out the work in a safe manner.
3. Identify the obligations, responsibilities and powers of the participants in the construction phase during the construction phase.
4. Define public procurement procedures.

1.4. Course content

Introduction to legal regulations in Croatia related to construction production (2 hours)
The Construction Act (6 hours)
Act on Physical Planning and Construction Activities and Activities (3 hours)
Environmental Protection Act (4 hours)
Law on the Protection of Cultural Heritage (3 hours)
Public Procurement Act (4 hours)
Occupational Safety and Health Act, by-laws regulating the field of occupational safety in more detail (6 hours)
Ordinance on Simple and Other Buildings and Works (2 hours)

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

1.6. Student obligations

Regular attendance at lectures.
Active participation in discussions.
Passing the oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	
Written exam		Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and being active in class	1,0	1, 2, 3, 4	Oral and written presentation, discussion and discussion	Recording attendance, questions during the processing of a new topic	10	20
Viva voce	1,00	1, 2, 3, 4	Conversation and discussion	Evaluation of responses according to the evaluation criteria	40	80

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

All the literature required to take the exam is available on the Internet (regulations published in the "Official Gazette"), and examples that further clarify and illustrate the content of the course to students are available on the course website or via the Microsoft Teams application.

Title	Number of copies	Number of students
Construction Act	Available online	40
Act on Physical Planning and Construction Activities and Activities	Available online	40
Physical Planning Act	Available online	40
Occupational Safety and Health Act	Available online	40
Law on the Protection and Preservation of Cultural Property	Available online	40
Public Procurement Act	Available online	40
Ordinance on Simple and Other Buildings and Works	Available online	40
Ordinances in the field of occupational safety	Available online	40

1.10. Supplementary literature

Fučić, L.: The Role of Regulation in the Development of Construction, Challenges in Construction 5, Croatian Construction Forum 2020, Proceedings, Croatian Association of Civil Engineers, Zagreb, 2020.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Assessment of student performance in exams
Feedback from students
Conducting university surveys on teachers and faculty surveys on subjects.
Information from employers (for students on internships and after employment of former students)

GENERAL INFORMATION		
Course Holder	mr. sc. Tatjana Mijušković - Svetinović	
The name of the college	Hydrology	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	REQUIRED	
Year / Semester	I. / 2.	
Point value and method of teaching	ECTS coefficient of student workload	3,0
	Number of hours (P+V+S)	15+15+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Acquisition of theoretical and practical knowledge in the field of hydrology, which includes water and the movement of water in nature, processes in the atmosphere

1.2. Requirements for enrolment in the course

Lacks

1.3. Expected learning outcomes for the course

1. Distinguish between different types of precipitation data processing and methods of determining mean precipitation heights in the basin;
2. Determine the characteristics of the basin important for hydrological treatment;
3. Construct a complex runoff hydrogram;
4. Analyze data on water levels and flows (flow curve, levelogram, hydrogram, duration and frequency curve)

1.4. Course content

History of hydrology, definitions, division and tasks. Water and its natural properties. Water distribution and its circulation in nature, hydrological cycle and water balance. Characteristics and significance of closed hydrological systems. Atmosphere, processes and measurements in the atmosphere, heat balance, air movements, air pressure, temperature, humidity. Precipitation, formation, division, measurement, data processing, precipitation intensity. Evaporation - the significance, methods and approaches of calculation, measurement. Surface runoff, natural water regime, runoff factors, catchment, hydrography of watercourses. Hydrometry, the importance of measurements in hydrology and the development of measurement techniques. Measurement of water depth, water level, velocity and water flow. Methods and processing of hydrometric quantities, levelograms and hydrograms, flow curve. Hydrological methods and procedures for water balancing, runoff coefficient, specific runoff.

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

1.6. Student obligations

Attendance at lectures and exercises, at least 70%.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper	x	Experimental work	
Written exam	x	Viva voce	x	Assay		Research	

Project		Continuous Knowledge Assessment		Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises activity in class	1,0	1 - 4	Oral presentation. Materials. Talking and solving the task on your own.	Attendance records	10	25
Seminar paper	0,5	1 - 4	Presentation	Review and evaluation	10	15
Final exam – written and oral	1,5	1 - 4	Conversation, answers to questions – written and oral	Assessment	30	60

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Ž. Vuković: Basics of Hydraulic Engineering, Part One, First Book, Zagreb, 1996	19	80
R. Žugaj: Hydrology, Faculty of Mining, Geology and Petroleum Engineering, Zagreb, 2000.	9	80
R. Žugaj: Hydrology, Faculty of Mining, Geology and Petroleum Engineering, Zagreb, 2015.	3	80

1.10. Supplementary literature

R. Žugaj: Hydrology for Agroecologists, Faculty of Agriculture, Zagreb, Zagreb, 2009.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

The results of the colloquium, the attendance of lectures and the degree of active participation of students. Feedback from students.

GENERAL INFORMATION		
Course Holder	mr. sc. Josipa Matotek	
The name of the college	Mathematics II	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	I. / II.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to help students master the basic concepts and their properties related to the functions of multiple variables and single and multiple integrals and their applications. Furthermore, the goal is to develop skills and abilities to identify, formulate and solve simpler tasks in these areas, using the synthesis of theoretical knowledge by applying them to tasks. The emphasis is on the development of logical thinking, reasoning and generalizing skills.

1.2. Requirements for enrolment in the course

Lacks

1.3. Expected learning outcomes for the course

1. Define and correctly interpret the basic concepts of integral calculus with single and multiple integrals
2. Distinguish between indefinite and definite integrals.
3. Calculate single and multiple integrals
4. Apply integral calculus to the calculation of some areas, circumferences and other physical quantities
5. Calculate the extremes of functions of multiple variables

1.4. Course content

Primitive function and indefinite integral. Integration rules. Integration techniques: replacement of the integration variable, partial integration. Integration methods: integral of rational, irrational and trigonometric functions. Integral sum, definite integral, and the Newton-Leibniz formula. Properties of a definite integral and the mean theorem of integral calculus. Application of a certain integral to calculate the area of a figure under the curve, the length of the arc of the curve, the circumference of the rotational body.
Euclidean space and functions of multiple variables. Surfaces of the second order. Limits functions of multiple variables, continuity, and partial derivatives. Derivativity and differentiability of functions of multiple variables. Extremes of functions of multiple variables. Multiple integrals. Polar, spherical and cylindrical coordinates. Substitution of variables in a triple integral. Application of double and triple integrals to determine circumference, moments and center of gravity.

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

1.6. Student obligations

Regular attendance, active participation in classes (proper keeping of class notes in notebooks), solving homework

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper		Experimental work	
Written exam	x	Viva voce	x	Assay		Research	
Project		Continuous Knowledge Assessment	x	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attendance and Class Activity	2,0	1. - 5.	Oral and written presentation and problem solving with the use of multimedia.	Keeping records of student arrivals and reviewing notebooks	0	0
Continuous Examination / Written and Oral Exam	3,0	1. - 5.	Colloquium or exam (written and oral)	Verification of the accuracy of procedures and solution of tasks	50%	100%

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
I. Slapničar: Mathematics 2, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture in Split, Split, 2002 (online version: http://www.fesb.hr/mat2)		40

1.10. Supplementary literature

B. P. Demidovič: Problems and solved examples from higher mathematics with application to technical sciences, Tehnička knjiga, Zagreb.
S. Suljagić: Mathematics 2, Faculty of Civil Engineering in Zagreb (online version: http://www.grad.hr/nastava/matematika/mat2/mat2.html)

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Marin Grubišić	
The name of the college	Mechanics	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 2.	
Point value and method of teaching	ECTS coefficient of student workload	6,0
	Number of hours (P+V+S)	30+45+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to build a system of knowledge necessary for the analysis and solution of problems that occur in engineering calculations of technical mechanics and statics.

1.2. Requirements for enrolment in the course

Lacks.

1.3. Expected learning outcomes for the course

1. Define and explain basic theorems and axioms in statics, the concept of force, momentum and force coupling, and apply the basic elements of vector calculus for force and momentum.
2. Solve the resultant and the disassembly of forces, reduce the system of forces and moments to a point, sketch a diagram of a free body, and apply the conditions of equilibrium to a free body.
3. Determine the static determination and geometric invariability of structural systems in plane and space.
4. Determine the reactions of simple beams and frame beams.
5. Calculate the values and draw diagrams of the internal forces of simple solid beams, and calculate the forces in the rods of simple truss supports.
6. Determine the position of the center of gravity, line, surface and body in the plane and space, and determine the active and passive response forces as well as the friction coefficients of slip, roll and rope friction problems.
7. Determine the forces in supports and cross-sections as well as the geometry of polygonal, parabolic and hyperbolic sprockets.
8. Apply the principle of virtual operation and potential energy in the analysis and calculation of simple full-fledged structural systems.

1.4. Course content

- Introduction to Mechanics, Basic Theorems and Axioms in Statics (5 hours)
- Force and moment of force, coupling of forces, Varignon's theorem, reduction of force to a point (5 hours)
- Analytical Assembly of Forces and Analytical Decomposition of Forces into Components (5 hours)
- Analytical Equilibrium Conditions, Free Body Diagram and Body Balance (5 hours)
- Statics of Rigid Bodies, Mechanical Systems, Simple Structural Systems and Loads (10 hours)
- Internal Forces in Cross-Sections and Diagrams of Internal Forces of Filled and Lattice Systems (15 hours)
- Calculation of chains (10 hours)
- Virtual work (10 hours)
- Center of gravity and friction of slipping, rolling and rope (10 hours)

1.5. Types of teaching (put X)	☒ lectures ☒ seminars and workshops ☐ exercises	☒ Independent tasks ☒ Multimedia & Network ☐ laboratory

1.6. Student obligations

- Regular attendance and participation in lectures and exercises.
- Active participation in discussions and seminars.
- Independent preparation and defense of the seminar paper.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper	X	Experimental work	
Written exam	X	Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2,5	1-2	Oral and written presentation	Recording attendance	7	10
Teaching activity	0,5	3-5	Conversation, discussion, group discussion	Questions during the processing of a new topic	3	10
Seminar paper, Research	1,0	2-8	Solving tasks, presentations	Review of written assignments and seminar paper	10	20
Written exam / Continuous examination of knowledge	1,0	1-5	Solving tasks	Review of the written examination	15	30
Viva voce	1,0	1-5	Conversation and discussion	Evaluation of responses	15	30

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
"Mechanics – Concepts, Principles and Selected Examples", 2024 – Ilijić, Saša open access http://sail.zpf.fer.hr/labs/mehanika2.pdf	online	40
"Mechanics", Lecture Script, 2013 – Fresl, Krešimir open access https://www.grad.unizg.hr/_download/repository/mehanika.pdf	online	40
"Building Statics 1", Lectures, 2017 – Fresl, Krešimir open access https://www.grad.hr/nastava/gs/gs1/gs1.pdf	online	40

1.10. Supplementary literature

"Statics and Mechanics of Materials", 4th edition, McGraw-Hill Education, 2020 – Ferdinand P. Beer et al.
"Structural Analysis", 10th edition in SI units, Pearson, 2019 – Hibbeler R.C.
"Fundamentals of Structural Analysis", 5th edition, Mc Graw Hill Education, 2018 – Kenneth M. Leet et al.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

- Regular student surveys
- Feedback from students
- Evaluation of student performance in exams and seminar papers

GENERAL INFORMATION		
Course Holder	Anamarija Štefić, prof.	
The name of the college	German Language II	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 2.	
Point value and method of teaching	ECTS coefficient of student workload	2,0
	Number of hours (P+V+S)	0+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

- Acquire and expand vocabulary related to construction
- Recognize and use professional terminology in a given context.
- adopt strategies for reading and listening, receiving and giving information
- master the more complex grammatical structures inherent in technical German
- develop oral communication in the field of profession
- Translate short texts from and into German

1.2. Requirements for enrolment in the course

Previous course German Language I

1.3. Expected learning outcomes for the course

1. Analyze a professional text (vocabulary and grammar) from the areas listed in the lecture content
2. Interpret tables and figures
3. Use appropriate professional terminology and phrases in written and oral communication
4. Analyze and summarize the textual content, extracting key arguments and definitions and structure them in writing in a clear and logical format.
5. Paraphrase and interpret key parts of a text orally, adapting the content to the specific goals and context of the communication.
6. Translate simpler professional texts into or from German, while maintaining the precision and clarity of professional terminology.

1.4. Course content

- Die sieben Weltwunder des Altertums (4)
- Die Weltwunder von heute (2)
- Natürliche Bausteine (4)
- Höher und höher – der Wettlauf in den Himmel (4)
- Staudamm (4)
- Wasserkraftwerk (2)
- Tunnel (2)
- Flughafen (2)
- Windenergieanage (2)
- Colloquiums (4)

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

1.6. Student obligations

Regular attendance at exercises.
Active participation in discussions
Regular solving of grammar and vocabulary exercises.
Written translation of assigned professional texts.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper		Experimental work	
Written exam	x	Viva voce		Assay		Research	
Project		Continuous Knowledge Assessment	x	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending exercises and being active in class	1,0	1,2,3,5,6	Oral and written presentation, solving tasks and translating texts, discussion and discussion on a given topic	Recording attendance, questions, checking assignments and written translations	25	50
Continuous Examination / Final Exam	1,0	1,3,4,6,	Solving tasks, translation, discussion	Review of the written examination, evaluation of answers	25	50

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Štefić, Anamarija (2015) Deutsch im Bauwesen, Josip Juraj Strossmayer University of Osijek, Faculty of Civil Engineering Osijek, Osijek	10	10

1.10. Supplementary literature

King Trick, Alemka (2005). Deutsch im Bauingenieurwesen, Croatian University Press, Zagreb
Ritoša, M. – V. Sekula (1989.) German for Civil Engineers, School of Foreign Languages, Zagreb
Tecilazić, Franci (1986.) Deutsch für Studenten der Architektur, Faculty of Architecture, University of Zagreb, Zagreb
Prager, A: "Trilingual Construction Dictionary", Masmedia, Zagreb, 2003.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.
Feedback from students.
Evaluation of students in exams.

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Mario Jeleč	
The name of the college	Fundamentals of Engineering Informatics II	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	I. / 2.	
Point value and method of teaching	ECTS coefficient of student workload	2,0
	Number of hours (P+V+S)	15+10+5

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Master computer modeling of simple structural systems in Autodesk Robot and SCIA Engineer. Know the types of computer models and modeling methods. Gather knowledge about the ways of setting geometry, materials and cross-sections. Familiarize yourself with the possibilities of setting boundary conditions and types of loads. Acquire knowledge about the ways of presenting results and evaluating them.

1.2. Requirements for enrolment in the course

There are no conditions.

1.3. Expected learning outcomes for the course

1. Create a geometric model of a simple 2D construction
2. Define the material type and cross-section and associate them with numerical elements
3. Distinguish and apply model boundary conditions
4. Distinguish and apply model loads
5. Evaluate budget results

1.4. Course content

Introduction to computer programs for the calculation and dimensioning of structures. Description of Autodesk Robot and SCIA Engineer. Introduction (interface and types of projects). Countertop and description of the working strips. Defining geometric axes and constructing networks. Display of 2D and 3D interfaces. Setting geometry and drawing line elements. Defining the type of material and cross-sections. Defining supports and boundary conditions. Types, assignment and combination of loads. Starting a budget. Review, display, evaluate and print results.

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

1.6. Student obligations

Regular attendance at lectures and exercises, active participation in classes and preparation of seminar papers.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper	X	Experimental work	
Written exam	X	Viva voce		Assay		Research	

Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	1,0	1, 2, 3, 4	Oral and written presentation	Recording attendance	0	0
Teaching activity	0,1	1, 2, 3, 4	Conversation, discussion and group discussions	Questions during the processing of a new topic	0	5
Seminar paper	0,3	1, 2, 3, 4, 5	Solving tasks	Review of written assignments and seminar paper	10	15
Written exam*	0,6	1, 2, 3, 4, 5	Solving tasks	Review of the written examination	50	100
Continuous Knowledge Assessment	0,6	1, 2, 3, 4, 5	Solving tasks	Review of the written examination	40	80

*if the student is not exempt from the written part of the exam through a continuous knowledge test

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Lectures on the course website		
"Autodesk Robot" User Manual		
User manual "SCIA Engineer"		

1.10. Supplementary literature

On-line courses for Autodesk Robot and SCIA Engineer software packages
Morris, Alan. A Practical Guide to Reliable Finite Element Modelling. John Wiley & Sons, 2008

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

The work of students is monitored through the regularity of attendance at lectures and exercises, activity in class, accuracy of the preparation of the seminar paper and written exam/continuous examination of knowledge. The results of the activities are evaluated through a system of scoring and evaluation with criteria.

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Hrvoje Ajman	
The name of the college	Physical Education II	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	I. / 2. semester	
Point value and method of teaching	ECTS coefficient of student workload	1,0
	Number of hours (P+V+S)	0+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Satisfying one of the primary human needs, movement. Determining the current state of students and intervening on this condition by adding new motor skills, nurturing and repeating already acquired motor skills, and harmonious and moderate development in the field of motor achievements and functional abilities.

1.2. Requirements for enrolment in the course

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1.3. Expected learning outcomes for the course

1. Apply ways of preserving health through PE teaching programs.
2. Encourage responsibility and independence.
3. Demonstrate work on devices for the development of motor skills.
4. Use healthy work and hygiene habits.

1.4. Course content

Kinesiology, Physical and Health Education, Kinesiological Recreation, Sport and Methodology of Sports Training, Kinesitherapy, Subject of Research and Structure of Kinesiology, Structure of Anthropological Space, Health Status, Functions of the Respiratory and Circulatory System.
Assessment of functional abilities and measuring instruments, Assessment of motor skills and measuring instruments, Assessment of morphological characteristics and measuring instruments, Planning and programming of transformation processes, Locomotor system - role of muscles and physiology of body posture, Assessment and evaluation of cumulative effects of recreational exercise programs, Basic methods of aerobic exercise, Basic methods of anaerobic exercise, Models of various sports and recreational programs.

1.5. Types of teaching (put X)	☐ lectures	☒ Independent tasks
	☒ exercises	☐ Multimedia & Network

1.6. Student obligations

Attending classes and participating in sports competitions.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max

		OUTCOME				
Attending classes	1,0	1, 2, 3, 4	Exercises	Task Execution Records and Attendance Records	-	-

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Vukić, Ž., S. Jančić: Handbook for Independent Targeted Training of Students, Osijek, 1999.		40

1.10. Supplementary literature

Mraković, M.: Introduction to Systematic Kinesiology, Zagreb, 1997.
Milanović, D.: Diagnostics in Sport, Rovinj, 1996.
Andrijašević, M.: Sports Recreation in the Place of Work and Residence, Zagreb, 1996.
Horga, S.: Psychology of Sport, Zagreb, 2009.
Rastovski, D.: How to Swim, Osijek, 2016.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Task execution records and attendance records. Assessment and assessment of the initial state. Evaluation of the immediate and cumulative effects of exercise.

GENERAL INFORMATION		
Course Holder	Prof. Dr. Sc. Ivana Miličević	
The name of the college	Building materials	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	II. / 3.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

To provide students with basic knowledge of building materials. Teach them to master basic handling skills laboratory equipment for testing building materials. Teach students ways to determine traits building materials as well as the interpretation of properties. Specific competencies would be developed within the framework of individual tasks in laboratory exercises.

1.2. Requirements for enrolment in the course

There are no conditions for enrollment.

1.3. Expected learning outcomes for the course

1. describe the technology of production of various building materials
2. Examine the properties of different building materials
3. compare the properties of different building materials
4. apply the test results of building materials
5. choose the type of building material with regard to its purpose in the building
6. explain the mechanisms of degradation of building materials
7. recognize the ways of protecting building materials with regard to degradation mechanisms

1.4. Course content

Introduction and historical development, division of material. (2 hours)
Properties, tests and application of cement. (2 hours)
Properties, tests and applications of aggregates. (2 hours)
Properties and application of water for making concrete and concrete additives. (2 hours)
Properties, tests and applications of fresh and hardened concrete. (2 hours)
Properties, tests and applications of wood. (2 hours)
Properties, tests and applications of metals. (2 hours)
Properties, tests and applications of building ceramics. (2 hours)
Properties, tests and application of binders and mortars. (2 hours)
Properties and application of glass. (2 hours)
Properties, tests and applications of polymers. (2 hours)
Properties, tests and application of stone. (2 hours)
Properties, tests and application of insulation materials. (2 hours)
New materials in construction. (2 hours)
Durability of the material. (2 hours)

1.5. Types of teaching (put X)	☒ lectures ☒ exercises	☒ Independent tasks ☒ laboratory

	☒ Field Teaching	☐ Mentoring work

1.6. Student obligations

Regular attendance at lectures and exercises.
Completed and submitted laboratory exercise forms.
Submitted the correct semester assignment.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	X
Written exam	X	Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2,0	1 to 7	Oral and written presentation	Recording attendance	7	10
Teaching activity	0,5	1 to 7	Conversation, solving a semester assignment	Semester Assignment Review	3	10
Experimental work	0,5	2, 3, 4	Independently conducting tests in the laboratory and solving tasks	Overview of Lab Exercise Patterns	10	20
Written exam / Continuous examination of knowledge	1,0	1 to 7	Solving tasks	Review of the written examination	15	30
Viva voce	1,0	1 to 7	Conversation and discussion	Evaluation of responses	15	30

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Mikoč, M., Building Materials, Faculty of Civil Engineering, University of Osijek, Osijek, 2006.	10	60
Bjegović, D., Štirmer, N., Theory and Technology of Concrete, Faculty of Civil Engineering, University of Zagreb, Zagreb, 2015.	20	60
Netinger, I.; Miličević, I., Collection of solved problems from Material, Faculty of Civil Engineering Osijek, Osijek, 2014.	20	60

1.10. Supplementary literature

Illston, J. M.; Domone, P. L. J.: Construction Materials: Their Nature and their Behaviour, 4th Edition. New York: SponPress, 2010.
Muravlov, M., Building Materials, Construction Book, 2007.
Ghosh, N.; Cement and Concrete Science Technology Vol – 1, Part – I, New Delhi, 1991.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	mr. sc. Tatjana Mijušković - Svetinović	
The name of the college	Hydromechanics	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	II. / 3.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Getting to know the basic laws of fluid mechanics as a basis for solving hydrotechnical problems.

1.2. Requirements for enrolment in the course

Lacks.

1.3. Expected learning outcomes for the course

1. Determine the magnitude and position of the hydrostatic pressure force on flat and curved surfaces.
2. Sort streams according to different criteria
3. Size the pressure piping for the actual liquid.
4. Size the cross-section of an open watercourse under conditions of uniform steady flow.
5. Describe the leakage and overflow of liquids.
6. Describe groundwater flow.
7. Know the characteristics of physical modeling.

1.4. Course content

Basic physical properties of liquids.
Hydrostatics. Hydrostatic pressure properties. Basic equation of hydrostatics. Total pressure on flat and curved surfaces. Buoyancy.
Hydrokinematics. Fluid movement and deformation. Basic kinematic elements – velocity, acceleration, velocity field, trajectory, current, current tube. Types of streaming. The law of conservation of mass. Continuity equation.
Hydrodynamics. Surface and volume forces. The law of conservation of motion. Bernoulli's equation for a perfect fluid. Bernoulli's equation for a real liquid. Hydrodynamic resistances. Surface resistance. Shape resistances. Steady flow in pressurized pipes. Leakage through small and large openings. Specific energy of the cross-section. Froude's number. Steady uniform flow in open watercourses. Chezy's equation. Transition from one streaming regime to another. Water jump. Leakage under the barriers. Overflow over the dressing.
Groundwater flow.
Physical modeling

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

1.6. Student obligations

Attending lectures and exercises. Creating a stand-alone task. Experimental work.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper		Experimental work	x
Written exam	x	Viva voce	x	Assay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending classes	2,0	1-7	Exposure and materials	Attendance records	0	5
Activities in Class	0,25	1-7	Talking, solving tasks and problems on your own	Records and verification	5	5
Experimental work	0,5	1-7	Laboratory testing	Verification of the study	5	10
Written exam	1,25	1-7	Solving tasks.	Solution Verification	20	40
Viva voce	1,0	1-7	Written and oral examination of theoretical knowledge and understanding of the material	Evaluation and evaluation	20	40

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Vuković, Ž. (1996): Basics of Hydraulic Engineering, Part One, Book One, Faculty of Civil Engineering, University of Zagreb	19	60
Jović, V. (2006): Basics of Hydromechanics, FGAG University of Split	17	60
Tadić, L. et al. (2021): A collection of tasks from Hydromechanics, available at www.gfos.hr	-	60

1.10. Supplementary literature

Pečornik, M. (1995): Collection of Problems in Fluid Mechanics, University of Rijeka

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Monitoring attendance of lectures and exercises. Constant interaction with students in laboratory exercises. By passing the exam through colloquiums, written and final oral exams. Analysis of pass rates in colloquiums, written and oral exams.

GENERAL INFORMATION		
Course Holder	Prof. Dr. Sc. Krunoslav Minažek	
The name of the college	Soil mechanics	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	II. / 3.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE		
1.1. Objectives of the course		
The aim of the course is to introduce students to the basic physical and mechanical properties of soil and the influence of water in the soil in the context of soil mechanics, and to enable them to analyze soil interventions (foundations, slopes, retaining structures, embankment structures) with the acquisition of basic theoretical knowledge.		
1.2. Requirements for enrolment in the course		
There are no prerequisites for taking/enrolling in courses		
1.3. Expected learning outcomes for the course		
1. Distinguish soil types and apply soil classification based on the established properties; 2. Explain and analyze the physical and mechanical properties of soil and the experiments that determine them; 3. Explain the basic concepts in the analysis of water seepage in the soil and perform calculations and analyses for simple cases of water flow through the foundation soil and embedded objects; 4. Apply methods of calculation of soil subsidence and consolidation and soil bearing capacity under shallow foundations; 5. Explain the basics of anti-slip slope safety analysis; 6. Calculate and analyze ground pressures on retaining structures, 7. Explain the principles of soil compaction and control of compacted soil properties		
1.4. Course content		
Introduction, basic soil properties, soil investigations, soil classification and identification (7 hours) Occurrence and flow of water in the soil (6 hours) Soil stresses, additional stresses (4 hours) Soil compressibility, soil subsidence, consolidation (6 hours) Soil Strength (6 hours) Slope stability (4 hours) Ground pressures on retaining structures (6 hours) Soil bearing capacity under shallow foundations (4 hours) Basics of soil compaction theory (2 hours) Development, submission and defense of the program, colloquia (15 hours)		
1.5. Types of teaching (put X)	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☒ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☒ laboratory ☐ Mentoring work ☐ Other_____
1.6. Student obligations		

Regular attendance at lectures and exercises.
Development and defense of programs.
Taking colloquiums or written and oral exams.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	
Written exam	X	Viva voce	X	Assay		Research	
Project	X	Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises, being active in classes	2,0	1-7	Oral and written presentation, conversation, discussion	Recording attendance, questions during the processing of a new topic	0	5
Project	0,5	3, 4, 6	Solving tasks, talking	Overview of created programs	0	15
Continuous Examination / Exam	2,5	1-7	Solving tasks, talking and discussing	Review of the written examination, evaluation of the oral answer	50	80

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Authorized lectures and exercise materials posted on the course website	-	Free download for course students
T. Roje Bonacci, : Mechanics of tla, GF Split, 2017.	5	40
M. Mulabdić: Soil Testing in the Geotechnical Laboratory, Faculty of Civil Engineering and Architecture Osijek, 2018.	10	40

1.10. Supplementary literature

Smith, Ian: Elements of Soil Mechanics, 9th edition, John Wiley & Sons, UK, 2014.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Regular student surveys
Feedback from students
Program Overview.
Evaluation of student performance in colloquiums and exams

GENERAL INFORMATION		
Course Holder	Assoc. Prof. Mirjana Bošnjak-Klečina	
The name of the college	Material resistance	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	II. / 3.	
Point value and method of teaching	ECTS coefficient of student workload	6,0
	Number of hours (P+V+S)	30+45+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Acquisition of knowledge about the behavior of an elastic deformable body due to the action of external load. Introduction to the concepts of stress and deformation, formulation of Hooke's law. Calculation and distribution of stresses in basic load cases; determination of the associated deformations.

1.2. Requirements for enrolment in the course

-

1.3. Expected learning outcomes for the course

1. Explain the basic principles of mechanics of deformable bodies
2. Relate the concept of stress and stress components with the concept of strain and strain components in the elastic behavior of materials
3. Calculated for basic load cases, associated stresses and deformations of structural elements
4. Identify supports exposed to loss of elastic stability (buckling)
5. Differentiate structural systems according to the degree of static uncertainty

1.4. Course content

General assumptions; the concept of stress, displacement and deformation. The relationship between stress and deformation. Hooke's Law. Elasticity constants of the material. The St. Venant Principle. Axial load on the rod. The influence of temperature. Strain concentration. Analysis of uniaxial state of stress and deformation. Mohr's circle. Shear (cut). Torsion of a rod with a circular cross-section. Geometric characteristics of straight cross-sections of rods. Bending of straight rods (pure bending, bending by longitudinal force, bending by transverse force). The concept of a cross-sectional nucleus. Deformation when bending. Twisting sticks. Simple static indeterminate brackets.

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

1.6. Student obligations

Regular attendance, colloquia, exam (continuous examination of knowledge during the semester or written and oral exam at the end of the semester).

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper	X	Experimental work	

Written exam	X	Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2,5	1,2,3,4,5	Oral and written presentation	Recording attendance	7	10
Teaching activity	0,5	1,2,3,4,5	Conversation, discussion, group discussion	Questions during the processing of a new topic	3	10
Seminar paper	0,5	1,2,3,4,5	Solving tasks, presentations	Review of written assignments and seminar paper	10	20
Written exam/ Continuous Knowledge Assessment	2,0	1,2,3,4,5	Solving tasks	Review of the written examination	15	30
Viva voce	0,5	1,2,3,4,5	Conversation and discussion	Evaluation of responses	15	30

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Đ. Matošević; Technical Mechanics II, J.J. Strossmayer University, Osijek, 2007	10	60
V. Šimić; Resistance of Materials I, Školska knjiga, Zagreb, 1992.	19	60

1.10. Supplementary literature

V. Šimić; Resistance of Materials II, Školska knjiga, Zagreb, 2002.

J. Brnić, G. Turkalj; Strength Science I, Faculty of Engineering, University of Rijeka, Rijeka, 2004

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Evaluation of student performance in exams and seminar papers. Feedback from students.

GENERAL INFORMATION		
Course Holder	Assoc. Prof. Tanja Kalman Šipoš	
The name of the college	Statics	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	II.	
Point value and method of teaching	ECTS coefficient of student workload	6,0
	Number of hours (P+V+S)	30+40+5

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to acquire knowledge about calculation assumptions, definition of an optimal static system, its properties, and analytical and numerical methods of calculation.

1.2. Requirements for enrolment in the course

-

1.3. Expected learning outcomes for the course

1. Analyze geometric invariability and static (in)determinacy of line systems.
2. Analyze the basic properties of statically determined systems and their diagrams of internal forces.
3. Calculate and determine internal force diagrams for any statically determined system.
4. Create a numerical model of a planar structural system.
5. Calculate and sketch influence lines for basic statically determined systems.

1.4. Course content

Introduction to Building Statics (5 hours)
Static (In)determinacy and Geometric Invariability of Static Systems (5 hours)
Complex Statically Determined Line Systems (25 hours)
Framework static systems with and without reinforcement (25 hours)
Influence Lines on Basic Static Systems (10 hours)
Introduction to Statically Indeterminate Systems (5 hours)

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

1.6. Student obligations

Regular attendance at lectures and exercises.
Active participation in discussions and seminars.
Preparation and presentation of the seminar paper.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper	X	Experimental work	

Written exam	X	Viva voce	X	Assay		Research	X
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2,5	1, 2, 3	Oral and written presentation	Recording attendance	7	10
Teaching activity	0,5	1, 2, 3	Conversation, discussion, group discussion	Questions during the processing of a new topic	3	10
Seminar paper, Research	1,0	2, 3, 4	Solving tasks, presentations	Review of written assignments and seminar paper	10	20
Written exam / Continuous examination of knowledge	1,0	1, 2, 3 ,4	Solving tasks	Review of the written examination	15	30
Viva voce	1,0	1, 2, 3 ,4	Conversation and discussion	Evaluation of responses	15	30

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
A. Mihanović, B. Trogrlić; Building statics I, Faculty of Civil Engineering, Architecture and Geodesy, Split, 2011.	10	60
V. Simović, Building Statics I, Civil Engineering Institute, Zagreb, 1988.	12	40

1.10. Supplementary literature

Krešimir Fresl, Civil Statics I, Faculty of Civil Engineering, University of Zagreb, 2017

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Evaluation of student performance in seminar papers and exams

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Hrvoje Ajman	
The name of the college	Physical Education III	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	II. / 3. semester	
Point value and method of teaching	ECTS coefficient of student workload	1,0
	Number of hours (P+V+S)	0+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Satisfying one of the primary human needs, movement. Determining the current state of students and intervening on this condition by adding new motor skills, nurturing and repeating already acquired motor skills, and harmonious and moderate development in the field of motor achievements and functional abilities.

1.2. Requirements for enrolment in the course

-

1.3. Expected learning outcomes for the course

1. Apply ways of preserving health through PE teaching programs.
2. Encourage responsibility and independence.
3. Demonstrate work on devices for the development of motor skills.
4. Use healthy work and hygiene habits.

1.4. Course content

Kinesiology, Physical and Health Education, Kinesiological Recreation, Sport and Methodology of Sports Training, Kinesitherapy, Subject of Research and Structure of Kinesiology, Structure of Anthropological Space, Health Status, Functions of the Respiratory and Circulatory System.
Assessment of functional abilities and measuring instruments, Assessment of motor skills and measuring instruments, Assessment of morphological characteristics and measuring instruments, Planning and programming of transformation processes, Locomotor system - role of muscles and physiology of body posture, Assessment and evaluation of cumulative effects of recreational exercise programs, Basic methods of aerobic exercise, Basic methods of anaerobic exercise, Models of various sports and recreational programs.

1.5. Types of teaching (put X)	☐ lectures ☒ exercises	☒ Independent tasks ☐ Multimedia & Network

1.6. Student obligations

Attending classes and participating in sports competitions.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max

		OUTCOME				
Attending classes	1,0	1, 2, 3, 4	Exercises	Task Execution Records and Attendance Records	-	-

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Vukić, Ž., S. Jančić: Handbook for Independent Targeted Training of Students, Osijek, 1999.		40

1.10. Supplementary literature

Mraković, M.: Introduction to Systematic Kinesiology, Zagreb, 1997.
Milanović, D.: Diagnostics in Sport, Rovinj, 1996.
Andrijašević, M.: Sports Recreation in the Place of Work and Residence, Zagreb, 1996.
Horga, S.: Psychology of Sport, Zagreb, 2009.
Rastovski, D.: How to Swim, Osijek, 2016.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Task execution records and attendance records. Assessment and assessment of the initial state. Evaluation of the immediate and cumulative effects of exercise.

GENERAL INFORMATION		
Course Holder	mr. sc. Siniša Maričić	
The name of the college	Environmental protection	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	II. / 3.	
Point value and method of teaching	ECTS coefficient of student workload	2,0
	Number of hours (P+V+S)	30+0+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Introduction to the concepts and importance of environmental elements. Raising awareness of global ecology as well as the necessity and measures of environmental protection. Understanding the impact of construction projects on the environment.

1.2. Requirements for enrolment in the course

There are no additional conditions.

1.3. Expected learning outcomes for the course

1. List and describe the basic components of the environment.
2. Identify potential environmental impacts, especially construction projects.
3. Analyze the main causes and consequences of environmental threats in the context of construction projects.
4. Assess the importance of sustainable development and environmental measures in construction practice.

1.4. Course content

What is the environment and what are its components. Air, water, soil, living world – the emergence and development of the ecosphere. Applying the concept of sustainable development. Legal basis for environmental protection. Impacts of construction projects on natural resources. Environmental Impact Studies. Particularly sensitive structures. Sustainable construction. Benefits and costs in environmental protection. The State of the Environment in the Republic of Croatia and Europe.

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

1.6. Student obligations

Regular attendance at lectures and exercises.
Active participation in discussions and workshops.
Preparation and presentation of the seminar paper.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper	X	Experimental work	
Written exam	X	Viva voce	X	Assay		Research	

Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	1,0	1, 2, 3	Oral and written presentation	Recording attendance	7	10
Teaching activity	0,1	1, 2, 3	Conversation, discussion, group discussion	Questions during the processing of a new topic	3	10
Seminar paper, Research	0,3	2, 3, 4	Solving tasks, presentations	Review of written assignments and seminar paper	15	30
Written exam / Continuous examination of knowledge	0,3	1, 2, 3 ,4	Solving tasks	Review of the written examination	15	30
Viva voce	0,3	1, 2, 3 ,4	Conversation and discussion	Evaluation of responses	10	20

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Glavač, V.: Introduction to Global Ecology, DUZPO, Croatian Forests; Zagreb, 1999.	-	40
Briški F.: Environmental Protection; University of Zagreb, Faculty of Chemical Engineering and Ecology; Zagreb, 2016.	5	40
Tadić, L.: Environmental Protection Strategy and the Role of Civil Engineering, Civil Engineers on the Road to Europe, (chapter in the book;, Osijek, 2003.	5	40
Herceg, N.: Environment and Sustainable Development; Synopsis d.o.o.; Zagreb, 2013.	2	40

1.10. Supplementary literature

Reports on the State of the Environment in the Republic of Croatia (www.mzopu.hr);
Bonacci, O.: Ecohydrology, Split, 2003;
Martinović, J.: Soil Science in Environmental Protection, Zagreb, 1997.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	Prof. Dr. Sc. Krunoslav Minažek	
The name of the college	Geotechnical Engineering	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	II. / 4.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

To introduce students to geotechnical interventions and objects through familiarization with the types and methods of conducting exploration works in the soil, analysis of shallow and deep foundations, calculation of retaining structures for embanked and buried objects, overview of landslide remediation methods and soil improvements with the application of the provisions of Eurocode 7 for geotechnical works.

1.2. Requirements for enrolment in the course

-

1.3. Expected learning outcomes for the course

1. Recognize geotechnical problems in construction and distinguish types of geotechnical interventions by complexity,
2. Define the types and scope of geotechnical investigations and observations and measurements depending on the type and complexity of various geotechnical interventions,
3. Analyze subsidence and soil bearing capacity and evaluate the suitability of the application of different types of shallow or deep foundations depending on the soil and construction conditions
4. Distinguish open pit protection techniques depending on the soil conditions and the environment of the open pit and categorize retaining structures by type, materials, method of construction and suitability of their selection depending on the soil conditions,
5. Evaluate the applicability of different methods and materials for soil improvement depending on soil and environmental conditions,
6. Describe the features of design, procedures and performance control of bulk objects,
7. Recognize the appropriateness of using different landslide remediation techniques depending on the type of landslide, soil and environmental conditions

1.4. Course content

Introduction, presentation of geotechnical objects and interventions, principles of calculation according to EC 7 (4 hours)
Geotechnical investigation works (4 hours)
Shallow foundations, complex foundations (6 hours)
Retaining walls, shaping and drainage (6 hours)
Open pits, excavation protection (retaining walls), anchors (4 hours)
Deep Foundation, Pile Foundation (6 hours)
Soil improvement methods (2 hours)
Shaping and control of slope stability, landslide remediation (4 hours)
Application of geosynthetics in geotechnics (4 hours)
Geotechnical Aspects of Design and Construction of Embankment Structures and Landfills (6 hours)

Measurements and observations of soil intervention (2 hours)
Basics of Rock Engineering (2 hours)
Development, submission and defense of the program, colloquia (10 hours)

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

1.6. Student obligations

Regular attendance at lectures and exercises.
Development and defense of programs.
Taking colloquiums or written and oral exams.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity		Seminar paper		Experimental work	
Written exam	X	Viva voce	X	Assay		Research	
Project	X	Continuous Knowledge Assessment		Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises, being active in classes	2,0	1-7	Oral and written presentation, discussion, discussion	Recording attendance, questions during the processing of a new topic	0	5
Project	0,5	2, 3, 4, 6	Solving tasks, talking	Overview of created programs	0	15
Continuous Examination / Exam	2,5	1-7	Solving tasks, talking and discussing	Review of the written examination, evaluation of the oral answer	50	80

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Authorized lectures and exercise materials posted on the course website	-	Free download for course students
T.Roje Bonacci, P.Miščević: Mechanics of tla and foundation, GF Split / GF Osijek, 2017.	5	40
Braja M. Das, Khaled Sobhan: Principles of Geotechnical Engineering, 9th edition, Cengage Learning, Boston, USA, 2017	1	40
M. Mulabdić: Soil Testing in the Geotechnical Laboratory, GRAFOS, 2018.	5	40
		40

1.10. Supplementary literature

Miščević, Predrag; Štambuk Cvitanović, Nataša; Vlastelica, Goran: Dimensioning of gravity retaining walls, University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Split, 2020,
Braja M. Das: Geotechnical Engineering Handbook, J. Ross publishing, 2011.
Mulabdić, Mensur; Bošnjaković, Matko: Glossary of Geosynthetics, Osijek: Faculty of Civil Engineering Osijek, 2011.

Bond Andrew, Harris Andrew: Decoding Eurocode 7, Taylor & Francis, UK, 2008.
1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies
Regular student surveys Feedback from students Overview of the seminar (program) Evaluation of student performance in colloquiums and exams

GENERAL INFORMATION		
Course Holder	Assoc. Prof. Prof. Dr. Sc. Ivana Šandrk Nukić	
The name of the college	Engineering Economics	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year	II. / 4. semester	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+0+30

DESCRIPTION OF THE COURSE		
1.1. Objectives of the course		
The aim of the course is to introduce students to the economic and legal determinants of business in construction with an emphasis on cost and income management and understanding their impact on business decision-making.		
1.2. Requirements for enrolment in the course		
Lacks.		
1.3. Expected learning outcomes for the course		
1. apply the acquired knowledge regarding the various legal possibilities of registration and dissolution of companies and crafts 2. explain the laws of supply and demand in the market and the reproduction cycle 3. Analyze direct and indirect costs 4. link capacity utilization to costs 5. calculate the cost price and the selling price 6. distinguish the basic financial categories: assets, equity, liabilities, income, expenses and profits; 7. Interpret basic macroeconomic indicators		
1.4. Course content		
Overview of the legal framework relevant to business in the construction industry (2 hours) Basic Concepts of Economics (4 hours) Resources and costs (8 hours) Financial Literacy (8 hours) Introduction to Management, Marketing and Entrepreneurship (6 hours) Macroeconomics (2 hours) Presentations of student seminars (20 hours) Group work and application of what has been learned in class (10 hours)		
1.5. Types of teaching (put X)	☒ lectures ☒ seminars and workshops ☐ exercises ☐ Distance education ☒ Field Teaching	☐ Independent tasks ☒ Multimedia & Network ☐ laboratory ☒ Mentoring work ☐ Other_____
1.6. Student obligations		
Attendance at lectures and exercises Creation and presentation of a seminar paper		

Taking colloquiums and/or exams

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper	x	Experimental work	
Written exam	x	Viva voce	x	Assay		Research	
Project		Continuous Knowledge Assessment	x	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2,0	1, 2, 3, 4, 5, 6, 7	Oral and written presentation, multimedia	Recording attendance	3	5
Activities in Class	0,5	1, 2, 3, 4, 5, 6, 7	Discussion; Mentored individual and/or group work of students	Teacher's evaluation of completed tasks, mutual evaluation of colleagues from the team	6	15
Seminar paper	1,0	1, 2, 3, 4, 5, 6, 7	Literature Search, Writing, Presenting	Overview of the seminar paper and the quality of the presentation	14	25
Continuous Knowledge Assessment	1,5	1, 2, 3, 4, 5, 6, 7	Solving tasks	Review of the written examination	27	55
(Written exam)	(1,3)	1,2,3,4, 5,6,7	Solving tasks	Review of the written examination	(20)	(40)
(Oral Exam)	(0,2)	1, 2, 3, 4, 5, 6, 7	Answering questions and discussing	Evaluation of responses	(7)	(15)

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Teaching materials from the lecture	Available online	35
www.zakon.hr	Available online	35

1.10. Supplementary literature

- Katavić Mariza: Basics of Economics for Builders
- Grubišić Dragana: Business Economics
- Čulo Ksenija: The Economics of Investment Projects
- Blank Leland, Tarquin Anthony: Engineering economics
(https://www.hzu.edu.in/engineering/engineering%20economy.pdf)
- Panneerselvam R.: Engineering Economics
(https://www.academia.edu/35775332/Engineering_Economics_by_Panneer_Selvam_pdf)

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.
Feedback from students.

GENERAL INFORMATION		
Course Holder	mr. sc. Tatjana Mijušković - Svetinović	
The name of the college	Water supply and drainage	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	II. / 4.	
Point value and method of teaching	ECTS coefficient of student workload	5
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE		
1.1. Objectives of the course		
Acquisition of theoretical knowledge about the management of water supply and drainage systems. Acquisition of practical knowledge in the field of design, hydraulic dimensioning and execution of individual parts of water supply and sewerage systems		
1.2. Requirements for enrolment in the course		
Lacks		
1.3. Expected learning outcomes for the course		
1. Identify individual water supply and sewerage systems. 2. Define the relevant parameters and hydraulically size the water supply and sewerage network. 3. Select and size the pumping station. 4. Calculate the dimensions of the water tank. 5. Define the works necessary for the construction of water supply and sewerage.		
1.4. Course content		
About water supply in general. Water consumption. Water supply systems and their division. Drinking water sources and water intakes. Drinking water conditioning procedures and facilities. Pumping stations – role, power calculation and choice of pumping units. Water tanks - role, sizing and equipment. Pressure reducing stations. Hydraulic calculation of the water supply network. Division of water supply networks. Execution, commissioning and maintenance of water supply facilities. About wastewater drainage in general. Types of wastewater, basic characteristics and their impact on the environment and human health. Drainage systems and their division. Basic schemes of sewage systems. Relevant quantities of wastewater. Basics of dimensioning individual objects and networks. Limitation of parameters when sizing sewage. Types of sewer collectors, materials, types, shapes and basic characteristics. Facilities on the sewerage network. Pumping stations. Rain relief. Retention basins. Control and cascade windows. Basic wastewater treatment procedures. Wastewater discharge, basic principles and discharge conditions.		
1.5. Types of teaching (put X)	☒ lectures ☒ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____
1.6. Student obligations		
Regular attendance and active participation in lectures and exercises. Creating a stand-alone task.		

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper	x	Experimental work	
Written exam	x	Viva voce	x	Assay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2	1 - 5	Oral and written presentation.	Attendance records	0	5
Teaching activity	0,75	1 - 5	Engaging in discussions. Solving a semester assignment.	File. Task overview.	15	25
Seminar paper	0,25	1 - 5	Creation and presentation	Valuation of work.	0	5
Written and oral exam	2	1 - 5	Review and discussion.	Evaluation and evaluation of responses	35	70

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Vuković, Ž. (1996): Basics of Hydraulic Engineering, Part One, Book Two, Faculty of Civil Engineering, University of Zagreb	10	50
Margeta, J.(2010): Water supply of settlements, planning, design, management, water treatment, Faculty of Civil Engineering and Architecture Split, 2010.	13	50
Margeta, J.: Sewerage of Settlements – Faculty of Civil Engineering and Architecture Split, 1998	15	50

1.10. Supplementary literature

Gulić, I.(2000): Water Supply, Croatian Association of Civil Engineers Zagreb, 2000.
D. Ljubisavljević, B. Babić, B., A. Đukić, B. Jovanović: Communal Hydraulic Engineering Examples from Theory and Practice, Faculty of Civil Engineering
Belgrade

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Vegetable information from students. Regular student surveys. Student performance on the exam.

GENERAL INFORMATION		
Course Holder	Assoc. Prof. Tihomir Dokšanović	
The name of the college	Fundamentals of Structural Engineering	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	II. / 4. semester	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

To train students to analyze the basic elements of constructions, with an emphasis on their role and behavior in real situations.
To enable students to classify different types of structures according to material, geometric properties and load transfer method.
Develop the ability to design basic layouts of structures that ensure spatial stability.
To encourage critical thinking and evaluation of various methods of structural design, with the application of modern European standards.
To ensure the practical application of the concept of reliability in building structures according to current standards (Eurocodes).
To enable students to produce a detailed load analysis for simple structures, including various typical actions.

1.2. Requirements for enrolment in the course

-

1.3. Expected learning outcomes for the course

1. Analyze the basic properties and role of key elements of the structure in real structures.
2. Classify different types of structures according to relevant parameters that affect their properties and behavior.
3. Design basic layouts for simple structures, with an emphasis on ensuring spatial stability.
4. Evaluate the advantages and disadvantages of different methods of structural calculation.
5. Apply the basic concepts of structural reliability according to modern European standards (Eurocodes).
6. To prepare a detailed load analysis for simple structures in buildings, taking into account the effects of dead weight, constant load, usable action, and the action of snow and wind.

1.4. Course content

Introduction to building structures: basic properties, stability, robustness and load-bearing capacity (2 hours).
Division of structures according to material, geometry and construction concept (2 hours).
Disposition of the structure: positioning and role of structural elements (2 hours).
Standards for the design of structures (Eurocodes) and calculation methods: limit states, reliability concept, partial coefficients (12 hours).
Typical actions on structures: dead weight, constant load, usable actions, snow and wind actions (8 hours).
Budget situations and combinations of actions (4 hours).
Exercises and practical applications (30 hours)

1.5. Types of teaching (put X)	☒ lectures ☐ seminars and workshops ☒ exercises	☒ Independent tasks ☒ Multimedia & Network ☐ laboratory

	☐ Distance education	☐ Mentoring work

1.6. Student obligations

Regular attendance at lectures and exercises.
Active participation in discussions.
Solving an independent task.
Passing continuous examinations of knowledge of the final exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	
Written exam	X	Viva voce		Assay		Research	X
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending classes	2,0	1, 2, 3, 4, 5, 6	Lectures and exercises	Recording attendance	7	10
Teaching activity	0,5	1, 2, 3, 4, 5, 6	Discussion and interactive discussion	Evaluation through active participation	3	10
Solving an independent task / Research	1,0	2, 3, 4, 6	Independent task	Review and grade the assignment	10	20
Written exam / Continuous examination of knowledge	1,5	1, 2, 3, 4, 5 ,6	Written exam / Colloquia	Review and assessment of the written examination	30	60

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
"Building Structures in Buildings" – D, Markulak, J. Zovkić, I. Kraus	14	40

1.10. Supplementary literature

Group of construction standards HRN EN 1990 and HRN EN 1991

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Monitoring through regularity of attendance
Feedback from students
Evaluation of student performance in exams and seminar papers

GENERAL INFORMATION		
Course Holder	dr. sc. Držislav Vidaković	
The name of the college	Construction technology	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	II. / 4.	
Point value and method of teaching	ECTS coefficient of student workload	7,0
	Number of hours (P+V+S)	45+45+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to introduce students to the technologies of "rough" construction works (especially earth and reinforced concrete) and standard construction machinery (basic types) with the possibilities of their application, and to train students for the analysis of time and labor costs necessary when making an offer, preparing (planning) construction and managing the construction site.

1.2. Requirements for enrolment in the course

Lacks.

1.3. Expected learning outcomes for the course

1. Explain the advantages and disadvantages and the possibility of applying equipment (machines, formwork, scaffolding, etc.) and technologies for the realization of construction processes.
2. Explain the content and use of various construction plants and workshops (crushing plants, concrete plants, reinforcement plants, carpentry plants/workshops, plants for the production of prefabricated reinforced concrete elements).
3. Dimensioning work processes with machines (determining the required number of individual machines and the duration of work).
4. Determine measures for concreting at high and low air temperatures.
5. Analyze the processes of industrial construction (methods of transport and assembly of prefabricated elements).
6. Compare individual work technologies (with different resources) through the calculation of performance, time and labor costs in order to select the best technology according to certain criteria.

1.4. Course content

Introduction to construction technology and construction machinery (2 hours)
Types and characteristics of construction machinery (2 hours)
Earthworks (excavation, relocation, processing) and earthmoving machinery (15 hours)
Cranes (4 hours)
Formwork and scaffolding (9 hours)
Reinforcement work (3 hours)
Production, transport, installation and processing of fresh concrete (6 hours)
Industrial Construction (4 hours)
Exercises with calculations related to machines (performance, duration of work, reserves and labor costs and selection of the type and number of machines), demonstration of technologies, determination of the cost-effectiveness of technologies (with regard to the amount of work), formwork removal time and concreting procedures at low temperatures (45 hours including time for colloquia)

1.5. Types of teaching (put X)	☒ lectures ☐ seminars and workshops	☐ Independent tasks ☒ Multimedia & Network

	☒ exercises ☐ Distance education ☐ Field Teaching	☐ laboratory ☐ Mentoring work ☐ Other_____

1.6. Student obligations

Regular attendance at lectures and exercises.
Active participation in discussions.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	
Written exam	X	Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	3,00	1, 2, 3, 4, 5, 6	Oral and written presentation and pictorial representations (photo and video)	Recording attendance	7	10
Teaching activity	0,50	1, 2, 3, 4, 5, 6	Talking, discussing, solving tasks	Questions during the processing of a new topic	3	10
Written exam / Continuous examination of knowledge	1,75	3, 4, 6	Solving tasks	Review of the written examination	20	40
Viva voce	1,75	1, 2, 4 ,5	Conversation and discussion	Evaluation of responses	20	40

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
"Lexicon of Machinery and Equipment for the Production of Building Materials: Effects of Machinery and Vehicles in Earthworks" - Zdravko Linarić	1	40
"Construction Technology" – Vjeran Mlinarić	5	40
"Organization of the execution of construction projects" - Rudolf Lončarić	8	40
"Carpentry, reinforcement and concrete works" - Gorazd Bučar	12	40
"Plants for the production of bulk and related mineral materials: crushing plants, concrete factories, asphalt bases" - Zdravko Linarić	2	40

1.10. Supplementary literature

"Machines in Construction" - Eduard Slunjski
"Formwork and scaffolding for concrete works" - Gorazd Bučar
"Construction Machinery" by Bogdan Trbojevic

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies
In order of relevance (objectivity, degree of coverage, etc.): - evaluation of students' performance in colloquiums, exams and seminar papers, - feedback from students, - conducting university surveys on teachers and faculty surveys on subjects, - Information from employers (for students on professional practice and after employment of former students).

GENERAL INFORMATION		
Course Holder		
The name of the college	Field Instruction	
Study program	Professional Undergraduate Study of Civil Engineering	
Status of the College	Mandatory	
Year / Semester	II. / 4.	
Point value and method of teaching	ECTS coefficient of student workload	2,0
	Number of hours (P+V+S)	0+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Developing direct insight into various aspects of construction projects. Lectures are conducted on-site ("in situ") during guided professional tours according to the field teaching plan. Cross-curricular linking possible. Recognizing the technique, technology and organization of different types of buildings and the manner of work.

1.2. Requirements for enrolment in the course

Lacks.

1.3. Expected learning outcomes for the course

1. Apply theoretical knowledge to analyze specific aspects of construction projects on site.
2. Recognize the technical, technological and organizational elements of different types of construction projects.
3. Interpret the specific processes and phases of a construction project in a spatial and temporal context.
4. Critically evaluate the technical and organizational approaches used on the observed construction projects.

1.4. Course content

Preparation and review of selected current construction projects in spatial and temporal context.
Getting to know and interpreting the specific processes of the selected project.

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

1.6. Student obligations

Attending field classes and actively participating during their implementation.
Students are required to adhere to occupational safety and health measures.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	
Written exam		Viva voce		Assay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS		TEACHING METHOD		SCORE

		LEARNING OUTCOME		EVALUATION METHOD	Min	Max
Attendance Continues	1,0	1, 2, 3, 4	Oral and written presentation	Recording attendance		
Teaching activity	1,0	1, 2, 3, 4	Conversation, discussion, group discussion	Questions during the field class		

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Jurjević, D.: Safety at Work for Students, Volume 15, Occupational Safety Library, Rijeka, 2018, available at http://www.riteh.uniri.hr/media/filer_public/53/e6/53e6944f-70ba-4854-bda3-6ae7d71b56fa/sigurnost-na-radu-za-studente-2018.pdf	Available online	60

1.10. Supplementary literature

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1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Regular student surveys.
Feedback from students.

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Hrvoje Ajman	
The name of the college	Physical Education IV	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	II. / 4. semester	
Point value and method of teaching	ECTS coefficient of student workload	1,0
	Number of hours (P+V+S)	0+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Satisfying one of the primary human needs, movement. Determining the current state of students and intervening on this condition by adding new motor skills, nurturing and repeating already acquired motor skills, and harmonious and moderate development in the field of motor achievements and functional abilities.

1.2. Requirements for enrolment in the course

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1.3. Expected learning outcomes for the course

1. Apply ways of preserving health through PE teaching programs.
2. Encourage responsibility and independence.
3. Demonstrate work on devices for the development of motor skills.
4. Use healthy work and hygiene habits.

1.4. Course content

Kinesiology, Physical and Health Education, Kinesiological Recreation, Sport and Methodology of Sports Training, Kinesitherapy, Subject of Research and Structure of Kinesiology, Structure of Anthropological Space, Health Status, Functions of the Respiratory and Circulatory System.
Assessment of functional abilities and measuring instruments, Assessment of motor skills and measuring instruments, Assessment of morphological characteristics and measuring instruments, Planning and programming of transformation processes, Locomotor system - role of muscles and physiology of body posture, Assessment and evaluation of cumulative effects of recreational exercise programs, Basic methods of aerobic exercise, Basic methods of anaerobic exercise, Models of various sports and recreational programs.

1.5. Types of teaching (put X)	☐ lectures	☒ Independent tasks
	☒ exercises	☐ Multimedia & Network

1.6. Student obligations

Attending classes and participating in sports competitions.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max

		OUTCOME				
Attending classes	1,0	1, 2, 3, 4	Exercises	Task Execution Records and Attendance Records	-	-

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Vukić, Ž., S. Jančić: Handbook for Independent Targeted Training of Students, Osijek, 1999.		40

1.10. Supplementary literature

Mraković, M.: Introduction to Systematic Kinesiology, Zagreb, 1997.
Milanović, D.: Diagnostics in Sport, Rovinj, 1996.
Andrijašević, M.: Sports Recreation in the Place of Work and Residence, Zagreb, 1996.
Horga, S.: Psychology of Sport, Zagreb, 2009.
Rastovski, D.: How to Swim, Osijek, 2016.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Task execution records and attendance records. Assessment and assessment of the initial state. Evaluation of the immediate and cumulative effects of exercise.

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Martin Zagvozda	
The name of the college	Roads	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	III. / 5.	
Point value and method of teaching	ECTS coefficient of student workload	6,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to introduce students to the problems of road design and geometry, as well as the problems of road construction and drainage, to the applicable regulations in road construction and to train them for road design using computers.

1.2. Requirements for enrolment in the course

No conditions

1.3. Expected learning outcomes for the course

1. Explain the basic principles of road traffic, safety, level of service and throughput, as well as basic driving dynamics.
2. Define and describe the elements of the cross-section of the road.
3. Define and calculate the horizontal and vertical elements of the road.
4. To develop a project of a road outside the settlement in simple conditions at the level of the conceptual design.
5. Distinguish the method of road construction depending on the terrain on which it is being built and the available material.

1.4. Course content

- Introduction, Division and Road Regulations (2 hours)
- Basic characteristics of vehicle movement and traffic (2 hours)
- Cross-section of the road (4 hours)
- Ground plan elements of the road axis (4 hours)
- Vertical road elements (4 hours)
- Spatial line guidance (2 hours)
- Road drainage (4 hours)
- Materials for road construction (4 hours)
- Lower road structure (2 hours)
- Pavement structures (2 hours)
- Creating a situation (8 hours)
- Making a longitudinal profile (8 hours)
- Cross-section making (8 hours)
- Preparation of technical description and preparation of project documentation (4 hours)
- Presentation and defense of the seminar paper (2 hours)

1.5. Types of teaching (put X)	☒ lectures ☐ seminars and workshops	☒ Independent tasks ☐ Multimedia & Network

	☒ exercises ☐ Distance education ☐ Field Teaching	☐ laboratory ☐ Mentoring work ☐ Other_____

1.6. Student obligations

Regular attendance at lectures and exercises.
Creation and presentation of the semester program.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	
Written exam	X	Viva voce	X	Assay		Research	
Project	X	Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Teaching Monitoring	2,0	1,2,3,5	Oral and written presentation	Recording attendance	7	10
Class activity	0,5	1,2,3,5	Conversation, discussion	Questions during the processing of a new topic	3	10
Project	1,5	3,4,5	Solving tasks, presentations	Overview of the seminar paper	10	20
Written exam	1,0	1,2,3,5	Solving tasks	Review of the written examination	15	30
Viva voce	1,0	1,2,3,5	Conversation and discussion	Evaluation of responses	15	30

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Željko Korlaet, Vesna Dragčević, "Road Design and Construction", Faculty of Civil Engineering, University of Zagreb, 2018	20	40
"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. 110/2001.	Available online	40

1.10. Supplementary literature

Vesna Dragčević, Željko Korlaet, "Basics of Road Design", Faculty of Civil Engineering, University of Zagreb, 2003
Vesna Dragčević, Tatjana Rukavina, "Lower Road Structure", Faculty of Civil Engineering, University of Zagreb, 2006

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.
Feedback from students.
Evaluation of performance in exams and seminar papers.

GENERAL INFORMATION		
Course Holder	dr. sc. Držislav Vidaković	
The name of the college	Construction management	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	III. / 5.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to train students for cost planning, construction preparation, and organization and management of construction sites (initially as an assistant site manager).

1.2. Requirements for enrolment in the course

Lacks

1.3. Expected learning outcomes for the course

1. Identify impacts on productivity on the construction site and ways to improve it.
2. Analyze the content of working hours.
3. Apply construction norms in the analysis and planning of construction works.
4. Analyze and estimate the costs of construction contractors.
5. Prepare a proof of measures, a statement of materials, a unit price analysis (calculate the factor for calculating indirect costs, make the main and auxiliary analysis), a cost estimate and a construction site scheme.
6. Explain the content and purpose of construction organization projects.
7. Keep (write) a construction diary, a record of working hours and a construction book.

1.4. Course content

Introduction to Construction Organization and Development of Organizational Theories (3 hours)
General principles of organization with an emphasis on application in construction production (1 hour)
The nature of time losses and negative and positive impacts on productivity (motivation, management, work organization – action on fatigue and rest, especially at high temperatures) and essential characteristics of construction workers (5 hours)
Structure of Working Time and Study through Studies of Movement and Time (1 hour)
Types, content and advantages and disadvantages of norms for construction work (1 hour)
Methods of Standardization of Time and Material Consumption – Application for Internal Standardization (2 hours)Content and Purpose of the Construction Organization Project – Preliminary and Main (2 hours)
Preliminary and preparatory work on the construction site (1 hour)
Organization of contractors and organization of the construction site – necessary resources (provision of materials, energy, etc.), space, displays, i.e. Schemes (4 hours)
Rules for the safe execution of work on the construction site (2 hours)
Types of Contractor Costs (1 hour)
Possibility to estimate costs and prices – available publications (1 hour)
Elements of the price of works and the principle of calculation of indirect costs (through factors) and direct costs in price analysis (2 hours)
Design, bid and contract cost estimate – writing/content of items and pricing (1 hour)
Calculation and collection of performed works through the construction book and situations (1 hour)

Content and management of mandatory documentation on the construction site (2 hours)
Exercises with the preparation of proof of measurements, statements of materials, calculation of the storage area, drawing a construction site diagram, determining the factors for covering indirect costs, unit price analysis and writing a cost estimate for a given example of a simple building (30 hours including time for colloquiums)

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

1.6. Student obligations

Regular attendance at lectures and exercises.
Active participation in discussions.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	
Written exam	X	Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending classes	2,00	1, 2, 3, 4, 5, 6, 7	Oral and written presentations and pictorial representations, use of appropriate computers. program	Recording attendance	7	10
Teaching activity	0,50	1, 2, 3, 4, 5, 6	Talking, discussing, solving tasks	Questions during the processing of a new topic	3	10
Written exam / Continuous examination of knowledge	1,25	3, 4, 5	Solving tasks	Review of the written examination	20	40
Viva voce	1,25	1, 2, 4 ,6, 7	Conversation and discussion	Evaluation of responses	20	40

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
"Organization of Construction Production" - Jadranko Izetbegović, Vedarn Žerjav	3	40
"Construction Organization Manual" - Mladen Vukomanović, Sonja Kolarić, Mladen Radujković	10	40
"Organization of the execution of construction projects" - Rudolf Lončarić	8	40
"Manual for Construction Entrepreneurship and Norms in Construction" - Gorazd Bučar	5	40

"Solved Examples of Tasks – Organization of Construction 1 and Planning Methods" - Mladen Radujković, Ivana Burcar Dunović, Mladen Vukomanović	0	40

1.10. Supplementary literature

"Norms and Standards of Work in Construction I – III"
"Organization of Construction" - Josip Marušić
"Organization of Construction" - Josip Klepac
"Organization of construction" - Ismet Gušić
"Organization of Construction Works" - Bogdan Trbojević

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

In order of relevance (objectivity, degree of coverage, etc.):
- evaluation of students' performance in colloquiums, exams and seminar papers,
- feedback from students,
- conducting university surveys on teachers and faculty surveys on subjects,
- Information from employers (for students on professional practice and after employment of former students).

GENERAL INFORMATION		
Course Holder	Prof. Dr. Sc. Marijana Hazima-Nyarko	
The name of the college	Fundamentals of concrete structures	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	III. / 5.	
Point value and method of teaching	ECTS coefficient of student workload	6,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE		
1.1. Objectives of the course		
Acquiring theoretical knowledge about the basic properties of reinforced concrete and the basics of dimensioning reinforced concrete elements and structures. Acquiring practical knowledge about the basics of dimensioning elements of reinforced concrete structures.		
1.2. Requirements for enrolment in the course		
Lacks.		
1.3. Expected learning outcomes for the course		
1. Explain the mechanical properties of reinforced concrete structures 2. To develop a layout solution for simpler floor plan layouts of structures and to carry out an analysis of the load and the calculation procedure of reinforced concrete elements of the structure 3. Calculate the required amount of reinforcement, i.e. dimension the cross-section loaded with bending, bending and longitudinal force, longitudinal centric force, and transverse force 4. Apply the principles of reinforcement of structural elements to the results of dimensioning.		
1.4. Course content		
Advantages and disadvantages of reinforced concrete structures. The concept of reinforced concrete. Basic concepts of a structural engineer. Design and calculation stages. Normative documents for the design and construction of concrete structures. Types of concrete. Concrete strength. Deformability of concrete under short-term, long-term and cyclic loads. Types of steel for reinforcement. Mechanical properties of reinforcing steel. Method of ultimate limit states (partial coefficients of safety). The concept of dimensioning a reinforced concrete section. Single-reinforced rectangular cross-section. Double-reinforced rectangular section loaded with bending. T section loaded with bending. Centric train. Eccentric Pressure and Train – Wuchovsky Method and Interaction Diagrams. Process of dimensioning to the torsional force. Dimensioning of one- and two-way load-bearing plates. Details and basic rules of reinforcement of simple rod and flat structural elements.		
1.5. Types of teaching (put X)	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☒ Independent tasks ☐ Multimedia & Network ☒ laboratory ☐ Mentoring work ☐ Other_____
1.6. Student obligations		
Regular attendance of lectures and exercises and preparation of semester work.		

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity		Seminar paper	x	Experimental work	
Written exam	x	Viva voce	x	Assay		Research	
Project		Continuous Knowledge Assessment	x	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2,0	1, 2, 3, 4	Oral and written presentation	Recording attendance	0	0
Seminar paper	1,0	2, 3, 4	Solving tasks, presentations	Review of written assignments and seminar paper	5	10
Written exam through continuous examination of knowledge	1,4	1, 2, 3 ,4	Solving tasks	Review of the written examination	20	40
Oral exam through Continuous examination of knowledge	1,6	1, 2, 3 ,4	Answering questions	Evaluation of responses	25	50
Written and oral exam*	3,0*	1, 2, 3 ,4	Problem solving, oral expression	Review of the written examination of knowledge and evaluation of answers	50	100

* If the student has not passed the exam through continuous examination of knowledge, access the written and oral method of taking the exam

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Sorić, Z., Kišiček, T. (2014). Concrete structures 1. University of Zagreb, Zagreb	24	40
Sorić, Z., Kišiček, T. (2018). Concrete structures 2. University of Zagreb, Zagreb	25	40

1.10. Supplementary literature

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	Prof. Dr. Sc. Ivan Radić	
The name of the college	Fundamentals of steel structures	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	III. / 5.	
Point value and method of teaching	ECTS coefficient of student workload	6,0
	Number of hours (P+V+S)	30+20+10

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to introduce students to steel as a building material, its production, types and mechanical characteristics, and to provide them with basic theoretical and practical knowledge about the design of steel structures according to modern regulations.

1.2. Requirements for enrolment in the course

Lacks

1.3. Expected learning outcomes for the course

1. Explain the advantages and disadvantages of steel as a building material
2. Apply the procedures of sorting and reducing cross-sections
3. Calculate the resistance of cross-sections to tensile, compression and bending
4. Calculate the resistance of elements to compression and to bending
5. Design joint details in simpler steel structures

1.4. Course content

Steel as a building material. Construction steels – types, production and properties. Steel products. Selection of the basic steel material. Classification and reduction of cross-sections. Calculation of tensile, compression and bending resistance of steel cross-sections. Calculation of structural elements on buckling and lateral-torsional buckling. Checks for border conditions
usability. Joints in steel structures. Protection of steel structures from corrosion. Protection of steel structures from fire.

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

1.6. Student obligations

Regular attendance at lectures and exercises.
Preparation of a seminar paper.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	☒	Teaching activity	☐	Seminar paper	☒	Experimental work	☐
Written exam	☒	Viva voce	☒	Assay	☐	Research	☐

Project	☐	Continuous Knowledge Assessment	☒	Report	☐	Practical work	☐

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2,0	1, 2, 3, 4, 5	Oral and written presentation	Recording attendance	5	10
Seminar paper	1,0	2, 3, 4	Solving tasks, presentations	Review of written assignments and seminar paper	5	10
Written exam / Continuous examination of knowledge	2,0	1, 2, 3 ,4, 5	Solving tasks	Review of the written examination	20	40
Viva voce	1,0	1, 2, 3 ,4, 5	Conversation and discussion	Evaluation of responses	20	40

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Markulak, D.: Calculation of steel structures according to EN 1993-1-1, Faculty of Civil Engineering Osijek, 2008	20	40
B. Androić, D. Dujmović, I. Džeba: Steel Structures 1, IA Projektiranje, Zagreb, 2009.	5	40

1.10. Supplementary literature

Markulak, D.: Special Chapters of Steel Structures, Faculty of Civil Engineering Osijek, 2010.
EN 1993-1-1 - Eurocode 3: Design of steel structures - Part 1-1: General rules and rules for buildings
HRN EN 1993-1-5 - Eurocode 3: Design of steel structures - Part 1-5: Plate structural elements
HRN EN 1993-1-8- Eurocode 3: Design of steel structures - Part 1-5: Calculation of connections

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Mario Jeleč	
The name of the college	Fundamentals of wooden structures	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Required	
Year / Semester	III. / 5.	
Point value and method of teaching	ECTS coefficient of student workload	6,0
	Number of hours (P+V+S)	30+20+10

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to introduce students to wood as a building material and to train them to understand its properties, possibilities of application and conditions of use in construction. The aim is to introduce students to the basic principles, methodology and techniques of designing wooden structures.

1.2. Requirements for enrolment in the course

-

1.3. Expected learning outcomes for the course

1. Describe the basic properties and basic types of wood (classes and strength classes).
2. Distinguish types of wooden structures according to function, static system and method of construction.
3. Carry out the basic procedures for dimensioning wooden structures according to the applicable standards.
4. Analyze examples of wooden structures and key aspects of their design.

1.4. Course content

Introduction to Timber Structures (4 hours)
Basic properties of wood as a building material (4 hours)
Types and divisions of timber structures with advantages and disadvantages (4 hours)
Basics of calculation and operation of wooden structures (4 hours)
Procedures for Dimensioning Timber Structures According to Boundary Conditions (8 hours)
Design and Dimensioning of Standard Joints of Timber Structures (4 hours)
Derived Examples and Case Studies (2 hours)

Exercises and practical applications (20 hours)
Presentation of seminar papers (10 hours)

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

1.6. Student obligations

Regular attendance at lectures and exercises.
Active participation in discussions.
Preparation and presentation of the seminar paper.

Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper	X	Experimental work	
Written exam	X	Viva voce	X	Assay		Research	X
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2,0	1, 2, 3, 4	Oral and written presentation	Recording attendance	3	5
Teaching activity	0,5	1, 2, 3, 4	Conversation, discussion and group discussions	Questions during the processing of a new topic	2	5
Seminar paper, Research	1,0	1, 2, 3, 4	Solving tasks and presentations	Review of written assignments and seminar paper	5	10
Written exam / Continuous examination of knowledge	1,5	1, 2, 3, 4	Solving tasks	Review of the written examination	20	40
Viva voce	1,0	1, 2, 3, 4	Conversation and discussion	Evaluation of responses	20	40

1.9. Required reading and number of copies 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 Press, Zagreb, 2005 (II edition 2007)	10	60
Rajčić, V., Čizmar, D., Stepinac, M.: Solved Examples from Wooden Structures, Faculty of Civil Engineering, University of Zagreb, Zagreb, 2014.	10	60

1.10. Supplementary literature

HRN EN 1995-1-1:2013/A2:2015 Eurocode 5: Design of timber structures - Part 1-1: General - General rules and rules for buildings
Sweedish Wood: Design of timber structures, Volume 1–3, Swedish Forest Industries Federation, 2015.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Regular student surveys
Feedback from students
Evaluation of student performance in exams and seminar papers

GENERAL INFORMATION		
Course Holder	Prof. Dr. Sc. Ivana Barišić	
The name of the college	Road construction and maintenance	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Electoral	
Year / Semester	III. / 6.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to introduce students to the procedure of selecting the type, method of installation and maintenance of the pavement structure of the road. Students will be able to choose materials and technologies for the construction and maintenance of pavement structures, identify the type and cause of damage and propose a way to repair the pavement structure.

1.2. Requirements for enrolment in the course

-

1.3. Expected learning outcomes for the course

1. Explain the behavior of individual parts of the pavement structure as well as the structure as a whole under different influences
2. Choose the appropriate type of pavement structure depending on the purpose of the traffic area
3. Choose the appropriate materials and technologies for the construction of the pavement structure
4. Recognize damage to pavement structures
5. Propose measures for the rehabilitation and reconstruction of the pavement structure.

1.4. Course content

Systems of modern pavement structures (2)
Influencing factors on pavement construction (6)
Design of pavement structures (2)
Cot (2)
Materials for the construction and construction of pavement structures (load-bearing layers, pavement curtains) (10)
Pavement Behavior and Damage (4)
Maintenance and restoration of pavement structures (4)

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

1.6. Student obligations

Regular attendance at lectures and exercises.
Making a semester paper.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity		Seminar paper	X	Experimental work	X
Written exam	X	Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending classes	2,0	1 - 5	Oral and written presentation	Recording attendance	3	5
Seminar paper	0,5	2	Oral and written presentation	Overview of the seminar paper	5	10
Experimental work	0,5	3	Oral presentation, experiment	Overview of the seminar paper	2	5
Written exam / continuous assessment	1,0	1 - 5	Written presentation	Review: writing a knowledge test	25	50
Viva voce	1,0	1 - 5	Oral presentation, conversation	Evaluation of responses	15	30

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Babić, B., Design of pavement structures, HDGI Zagreb, 1997.	6	15
Babić, B., Horvat, Z., Construction and Maintenance of Pavement Structures, Faculty of Civil Engineering, University of Zagreb, 1984.	3	15
General Technical Conditions for Road Works, Zagreb, IGH 2001.	Available online	15
Technical regulation for asphalt pavements, OG 48/21	Available online	15

1.10. Supplementary literature

Sršen, M.: Road Maintenance, Construction Yearbook, HSGI, Zagreb, 2000

Road Maintenance Ordinance (OG 90/14, 3/21)

Delatte N. J., Concrete Pavement Design, Construction, and Performance, 2007.

Griffiths, G, Thom N., Concrete Pavement Design Guidance Notes, 2000.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	Prof. Dr. Sc. Zlata Dolaček-Alduk	
The name of the college	Construction business in a digital environment	
Study program	Professional Undergraduate Study of Civil Engineering	
Status of the College	Electoral	
Year / Semester	III. / 6.	
Point value and method of teaching	ECTS coefficient of student workload	3,0
	Number of hours (P+V+S)	15+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Gaining knowledge and experience in the implementation of construction processes in the digital environment. To introduce students to the developed procedures of digital business in construction – electronic delivery and download of construction acts, eConference, ePermit, eConstruction diary, eSignature. To introduce students to the work and exchange of information in a virtual environment.

1.2. Requirements for enrolment in the course

Lacks.

1.3. Expected learning outcomes for the course

1. Use e-services in the construction business.
2. Exchange information in a virtual environment.
3. Organize a virtual team.
4. Create an integrated image of the construction project.

1.4. Course content

Lecture content
The digital transformation. Building digital capacities. The degree of economic and social digitalization. Digitalization in construction. Development of digital infrastructure (e-project documentation, e-procurement, e-processes, e-invoice). Digital Applications and Digital Platforms in Construction. Integration of new technologies into the internal business processes of construction companies.
Content of the exercises
Getting to know the work and using digital tools and platforms.

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

1.6. Student obligations

Regular attendance at lectures and exercises.
Preparation and presentation of the seminar paper.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper	X	Experimental work	
Written exam	X	Viva voce	X	Assay		Research	X
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	1,5	1, 2, 3, 4	Oral and written presentation	Recording attendance, assessing active participation in the discussion	7	10
Seminar paper, Research	0,5	1, 2, 3, 4	Solving tasks, presentations	Review of written assignments and seminar paper, evaluation of work according to evaluation criteria	15	30
Written exam / Continuous examination of knowledge	0,5	1, 2, 3, 4	Solving tasks	Review of written examination, evaluation of work according to assessment criteria	15	30
Viva voce	0,5	1, 2, 3, 4	Conversation and discussion	Evaluation of responses according to the evaluation criteria	15	30

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Construction Act	Available online	40
Physical Planning Act	Available online	40
Ordinance on the manner of conducting professional supervision of construction, conditions and manner of keeping a construction diary and on the content of the final report of the supervising engineer	Available online	40

1.10. Supplementary literature

World Business Council for Sustainable Development: Digitalization of the built environment: Towards a more sustainable construction sector, 2023, available at https://www.wbcsd.org/resources/digitalization-of-the-built-environment/
Jurčević, M.; Pavlović, M.; Šolman, H.: General Guidelines for the BIM Approach in Construction, Croatian Chamber of Civil Engineers, Zagreb, 2017

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Regular student surveys
Feedback from students
Evaluation of student performance in exams and seminar papers

GENERAL INFORMATION		
Course Holder	mr. sc. Siniša Maričić	
The name of the college	Hydrotechnical structures	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Electoral	
Year / Semester	III. / 6.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Point out the role and significance of water structures in hydrotechnical systems and the environment;
Getting to know the principles of functioning and the main parts of basic hydraulic systems and structures;
Present simple engineering calculations of the sizing of water structures and their assumptions.

1.2. Requirements for enrolment in the course

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1.3. Expected learning outcomes for the course

1. To distinguish the roles of individual hydrotechnical structures in hydrotechnical systems in the environment;
2. Describe the functioning and components of hydraulic systems and structures;
3. Analyze the key characteristics of the project site and plan the necessary investigation works in accordance with technical requirements and environmental conditions;
4. Define the works of repairing the foundation soil as part of hydrotechnical interventions;
5. Identify the design conditions for canal flowing, well pumping, and the design of spillways and dams;
6. Use calculations of the dimensions and stability of canals, wells, spillways and concrete dams.

1.4. Course content

Lectures:
Introduction – basic concepts, historical overview; Hydrotechnical structures, elements of the hydrosystem – purpose and tasks; Exploration works (substrates) – spatial characteristics (land and water); Foundation, grouting and diaphragms of hydraulic structures; Securing the construction site from water (zagati and drainage); Retention and accumulations – purpose, buildings; Dams – types, loads, calculations; Characteristics of embankment dams and embankments; Features of concrete dams; Specific constructions of dams, weirs; Buildings and devices for water leakage – overflows, outlets, waterfalls; Hydrotechnical tunnels and pipelines (tunnel lining, pipeline and accompanying facilities); Ducts – application and division, hydraulic properties, types and performance of linings; Arrangement and maintenance of waterways; Construction, route and technology of quays and breakwaters; Principle of operation and construction of hydroelectric power plants and pumping stations;
Exercises:
Tasks of practical problems of flowing with a free water face (open riverbeds) – stationary uniform flow, (channel capacity, flow profile design, stability of the riverbed and calculation of the watercourse lining, etc.); Tasks covering overflow and discharge problems for different volumes, conditions and types of facilities; Problems with groundwater pumping problems (well capacity, lowering of the groundwater level, group effect of pumping from wells, etc.; Tasks of basic load expression (hydrostatic pressure, buoyancy, etc.) on dams and dimensioning of important load-bearing components (base foot width, arc load-bearing capacity, prestressing force), etc.

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

1.6. Student obligations

Regular attendance at lectures and exercises and collection of work materials;
Active participation in discussions and workshops and independent task solving;
Preparation and presentation of the seminar paper and completion of the subject materials;
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper	X	Experimental work	
Written exam	X	Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2,0	1, 2, 3, 4, 5, 6	Oral and written presentation	Recording attendance	7	10
Teaching activity	0,3	1, 2, 3, 4, 5, 6	Conversation, discussion, group discussion	Questions during the processing of a new topic	3	10
Seminar paper	0,7	1, 2, 3, 4	Solving tasks, presentations	Review of written assignments and seminar paper	15	30
Written exam / Continuous examination of knowledge	1,0	1, 2, 3, 4, 5, 6	Solving tasks	Review of the written examination	15	30
Viva voce	1,0	1, 2, 3, 4, 5, 6	Conversation and discussion	Evaluation of responses	10	20

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Stojić, P., Hydrotechnical Structures, Book I, II, III, Faculty of Civil Engineering, University of Split, Split, 1997. (I), 1998.(II,III);	23	25
Vuković, Ž.: Basics of Hydraulic Engineering, Part One, Book Two, Aquamarine, Zagreb, 1995.	15	25
Josip Kirinčić : Ports and Terminals ; Školska knjiga, Zagreb, 1991	6	25
Nonveiller, E.: Embankment Dams, Školska knjiga, Zagreb, 1983.	13	25

1.10. Supplementary literature

Blind, H.: Waserbauten aus Beton, Berlin, Ernst und Sohn, 1987.

Pršić, M., Tadejević, Z.: River Waterways, script, Faculty of Civil Engineering, Zagreb, 1988.Svetličić, E., Open Watercourses - Regulations, textbook, Faculty of Civil Engineering Zagreb, Zagreb, 1987. Mosony, E.: Water Power Develompent. Vol. 1, 2 (A, B), Third Ed., Akademiai Kiado, Budapest, 1987. Technician – Construction Manual – 6, Construction Book, Belgrade, 1989.
1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies
Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	mr. sc. Tatjana Mijušković - Svetinović	
The name of the college	Home installations	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Electoral	
Year / Semester	III. / 6.	
Point value and method of teaching	ECTS coefficient of student workload	4,0
	Number of hours (P+V+S)	15+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Introduction to plumbing, sewage, fire protection installations in buildings from the aspect of function, position in the building, dimensioning, necessary spaces, and their fitting into modern solutions and construction technologies.
Introduction to the basics of DHW, gas, heating, cooling, ventilation, air conditioning, as well as electrical installations in construction.

1.2. Requirements for enrolment in the course

Lacks.

1.3. Expected learning outcomes for the course

1. To create graphic attachments (floor plans, axonometry, cross-sections, details) of water and sewerage installations as part of the project of simpler residential and commercial buildings.
2. Calculate complete plumbing and sewage installations for the same.
3. Prepare a proof of measures and a technical description for the same.
4. To supervise the execution of works on water supply and sewerage installations.
5. Describe the basics of electrical and mechanical installations (DHW, heating, ventilation and air conditioning).

1.4. Course content

Plumbing: cold water installations, basic diagrams of home plumbing, main parts of home plumbing, symbols to display in Elements of the divorce scheme. Fire protection with water. Hot water consumption, method of preparation, devices, display of installations and devices in schemes. Technical regulations for plumbing installations, design and sizing of hot and cold water installations: according to the flow, according to the speed of water flow in the pipes, the process with total losses, the process with special losses. Display in floor plans and schemes. Sewage: wastewater, sanitary and appliance items, pipes and fittings. The main parts of the domestic sewerage: horizontal floor network, vertical sewerage, domestic storm sewer, connection to the public sewer. Execution of domestic sewage. Dimensioning and design of sewerage installations, representation in floor plans and schemes.
Gas installations: types of gas for use in buildings, main parts of household installations, pipe routing in a building, design of domestic gas installations.
Central heating: thermal bridges, indoor surface temperature, heat loss calculation for a residential building.
Central heating installations in the building, description of the elements, scheme, placement in buildings, types and systems. Solar energy.
Electrical installations: types of electrical installations in buildings, basic schemes, material, wiring.
Lightning protection installations. Display in floor plans and schemes.
Ventilation: basics of ventilation, primary, secondary, basic schemes, devices.
Air conditioning: basics of air conditioning, individual and central devices, installation of devices.

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

1.6. Student obligations

Regular attendance at classes, making an independent assignment - project, seminar.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper	x	Experimental work	
Written exam	x	Viva voce	x	Assay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	1,5	1-5	Exposure	Attendance records	0	5
Teaching activity	1,25	1-5	Conversation and discussion. Creating a semester assignment.	Discussion. Overview of the assigned task	15	25
Seminar paper	0,25	5	Creation and presentation	Evaluation	5	10
Written exam	0,5	1-5	Answering questions / solving tasks	Evaluation of responses	15	30
Viva voce	0,5	1-5	Conversation	Evaluation of responses	15	30

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Radonić, M.: Water Supply and Sewerage in Buildings, Croatia knjiga Zagreb, 2003.	6	40
Tušar, B.: Home Sewerage, Faculty of Civil Engineering, Zagreb, 2001.	10	40

1.10. Supplementary literature

Blagojević, B.: Water Supply and Sewerage, Technical Book Belgrade, 2002.
Labudović, B.: Basics of Water and Gas Installation Technology, Energetika marketing, Zagreb, 2012.
Labudović, B.: Heating Manual, Energetika marketing, Zagreb, 2005.
Labudović, B.: Manual for Ventilation and Air Conditioning, Energetika marketing, Zagreb, 2015.
Čargonja, N. and Čargonja K.: Installations of Water Supply and Sewerage, Zagreb 1990.
Šivak, M.: Central Heating, Ventilation, Air Conditioning, Publishing Activity Marijan Šivak, Zagreb, 1998.
Rodeš, V.: Electrical Installations (Part 1 and 2), Electromechanical School Varaždin, 2007.
Harapin, A. and Galić, M. Home Installations, University of Split, Faculty of Civil Engineering, Architecture and Geodesy, 2012

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Program, seminars, colloquium results, attendance at lectures, feedback from students

GENERAL INFORMATION		
Course Holder	Assoc. Prof. Ivana Šandrk Nukić	
The name of the college	Management in construction	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Electoral	
Year / Semester	III. / 6. semester	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE
1.1. Objectives of the course
The aim of the course is to introduce students to the concept and scope of business management in construction with the purpose of achieving their understanding of all five managerial functions and training students for their application in the market.
1.2. Requirements for enrolment in the course
Lacks.
1.3. Expected learning outcomes for the course
1. Explain the process of organizing and the diversity of individual organizational structures. 2. Explain leadership theories. 3. Apply organizational dynamics management. 4. Apply interpersonal skills related to communication and teamwork. 5. Implement various human resources management techniques. 6. Explain organizational culture. 7. Carry out various analyses of strategic planning. 8. Describe the decision-making process.
1.4. Course content
Management Fundamentals: Definition, Functions, Levels (2 hours) Organizational Structure Design (2 hours) Planning and Control (Vision and Mission, Objectives, Types, Standards of Execution) (2 hours) Strategic Management and Competitive Advantage (2 hours) Circumstances, Types and Decision-Making Process (2 hours) Organizational dynamics: change management, learning organization, conflict management, diversity management (4 hours) Organizational culture in general, specifics in construction, challenges of globalization and international environment (4 hours) Theories of Leadership, the Relationship between Management and Leadership (2 hours) Job analysis, planning and human resources acquisition (2 hours) Monitoring work performance, career development, motivation strategies (2 hours) Personal Skills of a Manager (2 hours) Roles in the team, characteristics of groups and teams, managing teamwork (2 hours) Fundamentals of Quality Management (2 hours) Presentations of student seminars (20 hours) Group work and application of what has been learned in class (10 hours)

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

1.6. Student obligations

Attendance at lectures and exercises.
Creating and presenting a seminar paper.
Taking colloquiums and/or exams

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper	x	Experimental work	
Written exam	x	Viva voce	x	Assay		Research	
Project		Continuous Knowledge Assessment	x	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2,0	1-8	Oral and written presentation, multimedia	Recording attendance	3	5
Activities in Class	0,5	1-8	Discussion; Mentored individual and/or group work of students	Teacher's evaluation of completed tasks, mutual evaluation of colleagues from the team	6	15
Seminar paper	1,0	1-8	Literature Search, Writing, Presenting	Overview of the seminar paper and the quality of the presentation	14	25
Continuous Knowledge Assessment	1,5	1-8	Solving tasks	Review of the written examination	27	55
(Written exam)	(1,3)	1-8	Solving tasks	Review of the written examination	(20)	(40)
(Oral Exam)	(0,2)	1-8	Answering questions and discussing	Evaluation of responses	(7)	(15)

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Teaching materials from the lecture	Available online	25
www.zakon.hr	Available online	25

1.10. Supplementary literature

Sikavica,P., Bahtijarević-Šiber,F., Pološki-Vokić,N.: Foundations of Management
Sikavica,P., Bahtijarević-Šiber,F., Pološki-Vokić,N.: Contemporary Management
Sikavica,P., Novak,M.: Business Organization
Buble,M.: Management

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.
Feedback from students.

GENERAL INFORMATION		
Course Holder	Prof. Dr. Sc. Ivan Radić	
The name of the college	Fundamentals of masonry structures	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Electoral	
Year / Semester	III. / 6.	
Point value and method of teaching	ECTS coefficient of student workload	3,0
	Number of hours (P+V+S)	30+15+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to introduce students to the basic types of masonry and to enable them to analyze and calculate the action on masonry and calculate the resistance of masonry, taking into account the wide distribution of this type of construction.

1.2. Requirements for enrolment in the course

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1.3. Expected learning outcomes for the course

1. Explain the advantages and disadvantages of masonry structures compared to other structures
2. Analyze the actions of masonry loads according to applicable standards
3. Dimensioning the basic types of masonry according to current standards
4. Calculate simple masonry structures according to current standards

1.4. Course content

Introduction to Masonry Structures (5 hours)
Materials and Mechanical Properties of Masonry Structures (7 hours)
Load action on masonry structures (3 hours)
Examples of calculations of various types of masonry (10 hours)
Practical examples and basics of numerical modeling of masonry structures (5 hours)

Exercises and seminar assignments (15 hours)

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

1.6. Student obligations

Regular attendance at lectures and exercises.
Active participation in classes.
Preparation and defense of the seminar paper.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity		Seminar paper	X	Experimental work	
Written exam	X	Viva voce	X	Assay		Research	X
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	1,5	1, 2, 3	Oral and written presentation	Recording attendance	7	10
Seminar paper, Research	0,5	2, 3, 4	Solving tasks, presentations	Review of written assignments and seminar paper	10	20
Written exam / Continuous examination of knowledge	0,5	1, 2, 3 ,4	Solving tasks	Review of the written examination	15	30
Viva voce	0,5	1, 2, 3 ,4	Conversation and discussion	Evaluation of responses	15	30

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Masonry Structures : A Manual / Jure Radić et al.	3	40
Masonry Structures / Zorislav Sorić ; 2016.	15	40
Masonry Structures I / Zorislav Sorić ; 2004.	6	40

1.10. Supplementary literature

Masonry structures: a manual for investors, designers, supervising engineers and contractors / prepared by D. Aničić ... [et al.]; 2010.
Masonry Structures I / Zorislav Sorić ; 1999.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	dr. sc. Držislav Vidaković	
The name of the college	Professional practice	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	III. / 6.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	15+120+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Gaining experience and insight into the activities of companies and institutions that perform activities in the field of construction. Within the framework of professional practice, students acquire generic knowledge and achieve generic learning outcomes (business responsibility, communication skills and teamwork) as well as specific knowledge and specific learning outcomes related to the activities of the company in which the internship is realized (design, construction or administrative procedures).

1.2. Requirements for enrolment in the course

Lacks.

1.3. Expected learning outcomes for the course

1. Use professional language in communication.
2. Identify the stages of project implementation.
3. Recognize the organizational structure, participants in the construction project and the structure of the work environment.
4. Critically assess the acquired knowledge of the courses and apply them in solving specific tasks.
5. Analyze the technical documentation required for construction.
6. To design a conceptual solution to the problem defined by the project task.
7. Use advanced information technologies.
8. Apply the rules of occupational safety.

1.4. Course content

Explanation of the purpose and manner of performing the internship (2 hours)
Occupational safety rules on construction sites (8 hours)
Professional practice in a company under the supervision of a mentor (120 hours)
Presentation of the results of the work after the internship (5 hours)

1.5. Types of teaching (put X)		
	☒ lectures	☐ Independent tasks
	☐ seminars and workshops	☐ Multimedia & Network
	☐ exercises	☐ laboratory
	☐ Distance education	☐ Mentoring work
	☐ Field Teaching	☒ Other: professional practice

1.6. Student obligations

During the internship: attending the internship and keeping a diary of the internship, confirmation from the employer as proof of successfully completed internship.
Post-traineeship: preparation of a written report (presentation) presenting and describing the activities and tasks carried out during the traineeship.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity		Seminar paper		Experimental work	
Written exam		Viva voce		Assay		Research	
Project		Continuous Knowledge Assessment		Report		Diary of professional practice	X

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures	0,5	8	Oral and written presentation	Recording attendance	7	10
Internship and preparation of a professional practice diary	4,0	1, 2, 3, 4, 5, 6, 7, 8	Mentor supervision	Evaluation of mentors, Review of professional practice diaries,	35	70
Presentation of short practice	0,5	1, 4, 7, 8	Solving tasks, presentation	Confirmation and evaluation of the presentation, evaluation of the final presentation according to the evaluation criteria	8	20

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Instructions for professional practice	Available online	40
Professional Practice Manual, Faculty of Civil Engineering and Architecture Osijek, Osijek, 2023.	Available online	40
Safety Sign Ordinance	Available online	40
Regulations on the use of personal protective equipment	Available online	40

1.10. Supplementary literature

Kacian, N.: Safety during construction works, Institute for Safety Research and Development, Zagreb, 2011.
Jurjević, D.: Safety at Work for Students, Volume 15, Occupational Safety Library, Rijeka, 2018, available at http://www.riteh.uniri.hr/media/filer_public/53/e6/53e6944f-70ba-4854-bda3-6ae7d71b56fa/sigurnost-na-radu-za-studente-2018.pdf

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Evaluation of students' performance in exams and seminar papers.
Opinion of the mentor during the internship (in the forms that must be filled out)
Regular student surveys
Feedback from students

GENERAL INFORMATION		
Course Holder	dr. sc. Držislav Vidaković	
The name of the college	Contracting and planning the execution of construction projects	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Electoral	
Year / Semester	III. / 6.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to train students for time (dynamic) planning of construction works using several techniques and to familiarize students with the procedures in job tenders (bidding) and contractual relations between contractors and investors (defined through contract items and Special Construction Customs).

1.2. Requirements for enrolment in the course

Lacks

1.3. Expected learning outcomes for the course

1. Explain the advantages and disadvantages and the possibility of applying basic planning techniques, i.e. dynamic plans depending on the characteristics of the construction project.
2. Determine the duration of the activity according to the available resources and the required resources according to the required time.
3. Compile a list of activities for dynamic plans (break down the project into activities and define the links between them).
4. Create a dynamic performance plan (Gantt chart and structure analysis and network plan time analysis) and derived plans of required workers and costs/revenues at the project level.
5. Explain the procedure for getting a job through a competition.
6. To learn about the relationships and obligations between the investor and the contractor.
7. Define the content of the contract for the execution of construction works.

1.4. Course content

Development of the construction project to the realization phase (3 hours)
The process of searching for the best contractor and making bids (3 hours)
Contract for the execution of construction works (4 hours)
Common relations/obligations between the investor and the contractor defined by the Special Construction Regulations (2 hours)
Risks in the implementation of construction projects to be taken into account in planning and contracting (3 hours)
Principles of planning and problems with planned deadlines and costs of realization of construction projects (2 hours)
Types of dynamic plans and their characteristics and scope of application (5 hours)
Defining the activities of dynamic plans for the execution of construction projects (1 hour)
Ways to determine the duration of the activity and the required resources (2 hours)
Stages of creating network plans – with clarification of the links between activities and slacks, calculation of the content of the plan node and principles of mathematical optimization (4 hours)
Control of the implementation of plans (1 hour)
Exercises with calculations of the duration of activities and required workers and the creation of Gantt charts, cyclograms, histograms, network plan and S-curves of costs and revenues (30 hours including time for colloquiums)

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

1.6. Student obligations

Regular attendance at lectures and exercises.
Active participation in discussions.
Passing the written and oral exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity	X	Seminar paper		Experimental work	
Written exam	X	Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment	X	Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises	2,00	1, 2, 3, 4, 5, 6, 7	Oral and written presentations and work with a suitable computer. programs	Recording attendance	7	10
Teaching activity	0,50	1, 2, 3, 5, 7	Talking, discussing, solving tasks	Questions during the processing of a new topic	3	10
Written exam / Continuous examination of knowledge	1,25	2, 3, 4	Solving tasks	Review of the written examination	20	40
Viva voce	1,25	1, 5, 6, 7	Conversation and discussion	Evaluation of oral answers	20	40

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
"Project Planning and Control" - Mladen Radujković et al.	15	40
"Solved Examples of Tasks – Organization of Construction 1 and Planning Methods" - Mladen Radujković, Ivana Burcar Dunović, Mladen Vukomanović	0	40
"Manual for Construction Entrepreneurship and Norms in Construction" - Gorazd Bučar	5	40
"Organization of the execution of construction projects" - Rudolf Lončarić	8	40
"Special Customs on Construction"	Freely available online	40
"Civil Obligations Act"		40

1.10. Supplementary literature

"Organization of Construction" - Josip Marušić
"Building Standards I – III"
"Methods of Network Planning and Their Application in Construction Management" - Sergey Nonveiler

"Network Planning Technique" - J. Bradenberger, R. Konrad
1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies
In order of relevance (objectivity, degree of coverage, etc.): - evaluation of students' performance in colloquiums, exams and seminar papers, - feedback from students, - conducting university surveys on teachers and faculty surveys on subjects.

GENERAL INFORMATION		
Course Holder	Prof. Dr. Sc. Krunoslav Minažek	
The name of the college	Introduction to Geotechnical Design	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Electoral	
Year / Semester	III. / 6.	
Point value and method of teaching	ECTS coefficient of student workload	3,0
	Number of hours (P+V+S)	15+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

To instruct students on the role and significance of a geotechnical project within the design of various buildings, to introduce students to the principles of geotechnical design, regulations, rules and content of a geotechnical project. To train students to form a program of geotechnical investigations, select parameters for calculation, design a technical solution, form a budget model and basic calculations of typical geotechnical problems; shallow foundation and pile foundation, retaining structures, open pit protection, soil improvement, landslide stabilization.

1.2. Requirements for enrolment in the course

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1.3. Expected learning outcomes for the course

1. Identify interventions and objects that require the development of a geotechnical project, on the basis of the characteristics of the intervention and soil data, carry out a preliminary geotechnical categorization,
2. To design a plan of geotechnical investigation works for typical geotechnical problems,
3. To carry out the analysis and evaluation of the results of geotechnical investigation works and the selection of parameters for the budget,
4. Identify conditions and limitations and define the concept of a technical solution, a budget model and carry out calculations and dimensioning of typical (simpler) geotechnical problems,
5. evaluate and verify different variants of the technical solution of typical (simpler) geotechnical problems and define and elaborate the technical conditions for the selected technical solution
6. Create elements of a geotechnical design for typical geotechnical structures (technical description, calculations, drawings)

1.4. Course content

1. Significance of the geotechnical design for objects and structures, interaction of the geotechnical design and the design of the structure,
2. Task and content of geotechnical documentation: studies, projects, ordinances
3. Principles of geotechnical design, regulations and rules for design -EC 7 (through specific projects), connection of exploration works, design solution, execution and performance control,
4. Geotechnical investigations, analysis and selection of parameters for calculation, geotechnical model settings (on specific projects)
5. Calculation methods in geotechnics - through concrete projects
6. Conditions for defining the technical solution and presentation of technical solutions for typical geotechnical interventions and interventions related to environmental protection
7. Calculations of typical geotechnical problems; shallow and pile foundation, retaining structures, open pit protection, soil improvement, landslide stabilization

8. Critical review of the concept of foundation solutions through specific projects for selected common geotechnical interventions (selection of exploration works, choice of soil parameters, influence of calculation method, importance of observation and measurement, control of the execution of works).

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

1.6. Student obligations

Regular attendance at classes and the creation of a semester program. Taking the exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	X	Teaching activity		Seminar paper	X	Experimental work	
Written exam	X	Viva voce	X	Assay		Research	
Project		Continuous Knowledge Assessment	X	Report		Practical work	

NOTE: * - or colloquia (continuous examination) or exam (written + oral together)

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attending lectures and exercises, being active in classes	1,5	1-7	Oral and written presentation, discussion, discussion	Recording attendance, questions during the processing of a new topic	5	10
Development and defense of the program	0,5	3,4,6	Solving tasks, talking, presentations	Overview of created programs and presentations	15	40
Exam	1,0	1-7	Solving tasks, talking and discussing	Review of the written examination, evaluation of the oral answer	30	50

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Authorized lectures and exercise materials posted on the course website,	Available online	10
Mulabdić, Mensur: Soil Testing in the Geotechnical Laboratory, Josip Juraj Strossmayer University of Osijek, Faculty of Civil Engineering and Architecture Osijek, Osijek, 2018.	1	10
Roje-Bonnaci, Tanja: Soil Mechanics, University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Split, 2017.	1	10
Braja M. Das,Khaled Sobhan: Principles of Geotechnical Engineering, 9th edition, Cengage Learning, Boston, USA, 2017.	1	20

Miščević, Predrag; Štambuk Cvitanović, Nataša; Vlastelica, Goran: Dimensioning of gravity retaining walls, University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Split, 2020.	1	10
1.10. Supplementary literature		
EC 7 standards: HRN EN 1997-1:2012/A1:2014 and HRN EN 1997-1:2012/NA:2016 Eurocode 7 -- Geotechnical design -- Part 1: General rules and rules and national annex, HRN EN 1997-2:2012 Eurocode 7 -- Geotechnical design -- Part 2: Exploration and testing of foundation soil (EN 1997-2:2007+AC:2010), Bond Andrew, Harris Andrew: Decoding Eurocode 7, Taylor & Francis, UK, 2008. Technical Regulation for Building Structures (OG 17/17, 75/20)		
1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies		
Regular student surveys Feedback from students Evaluation of student performance in exams and seminar papers		

GENERAL INFORMATION		
Course Holder		
The name of the college	Undergraduate Thesis	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Mandatory	
Year / Semester	III. / 6. semester	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	0+60+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

Independent development and presentation of large-scale work through a conceptual solution or a solution to a theoretical or practical problem in construction (building structure or system) of limited complexity.

1.2. Requirements for enrolment in the course

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1.3. Expected learning outcomes for the course

1. Define a theoretical or practical problem.
2. Independently conduct research work related to the topic of the final thesis.
3. Apply the acquired knowledge and acquired competencies during the study.
4. Independently apply scientific methods and analysis techniques in problem solving.
5. Independently solve a theoretical or practical problem.
6. Present and interpret the results of the research through the preparation of the final thesis.

1.4. Course content

The student, in cooperation with the mentor, conducts research work related to the topic of the final thesis. The paper is made in writing.

1.5. Types of teaching (put X)	☒ Mentoring work	☒ Independent tasks

1.6. Student obligations

Consultations with a mentor, independent research work and preparation of a final thesis.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Independent work	X	Teaching activity		Seminar paper		Research	X

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Consultations with a mentor, research and use of literature, independent research work, implementation of the practical part of the work,	6,0	1, 2, 3, 4, 5, 6	Mentoring work - preparation of the task and the framework content of the final work	Evaluation and evaluation of the final thesis	50	100

preparation of the final paper						

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Oraić Tolić, D.: Academic Letter, Naklada Ljevak d.o.o., Zagreb, 2011.		
Jakobović, Z.: Writing and Editing Professional and Scientific Publications, Kiklos – Krug knjiga d.o.o., Zagreb, 2013.		
Silobrčić, V.: How to Compose, Publish and Evaluate a Scientific Work, Medical Publishing House, Zagreb, Zagreb, 1998.		

1.10. Supplementary literature

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

Anonymous, quantitative standardized student survey on the subject and work of teachers conducted by the Office for the Improvement and Quality Assurance of Higher Education of the Faculty of Civil Engineering and Architecture Osijek.

GENERAL INFORMATION		
Course Holder	Doc. dr. sc. Danijela Lovoković	
The name of the college	Building and finishing works	
Study program	Professional Undergraduate Civil Engineering	
Status of the College	Electoral	
Year / Semester	III. / 6.	
Point value and method of teaching	ECTS coefficient of student workload	5,0
	Number of hours (P+V+S)	30+30+0

DESCRIPTION OF THE COURSE

1.1. Objectives of the course

The aim of the course is to introduce students to the different purposes and typologies of buildings and to teach them the basic functional contents of residential and public buildings. Students will be trained to understand the relationship between function, construction and form in the architecture of buildings. Introduction to the theoretical foundations, methods and individual phases of architectural design will be learned through functional, design and constructive design of a family house. They will get to know different types of finishing works and learn the characteristics of individual materials used in final works. They will compare the advantages and disadvantages of individual types of finishing works.

1.2. Requirements for enrolment in the course

No conditions

1.3. Expected learning outcomes for the course

1. Define architecture and building.
2. Distinguish between different types and types of buildings.
3. Compare the functional, constructive and design characteristics of buildings.
4. Analyze residential and public buildings.
5. Carry out the process of architectural design.
6. Functionally organize, construct and design a family house.
7. Identify types of finishing works in the building industry and compare the characteristics of materials for finishing works in the construction industry.

1.4. Course content

Features and characteristics of architecture, experience and use of space, man / user - a fundamental factor in the organization and design of space, design as a creative process. (2 hours)
Theoretical foundations of design, relationship and significance of function, construction, design. Location and orientation of the building in relation to insolation and other natural conditions, depending on the purpose of the building and the function of the room. The importance of the choice of materials, structural system and construction method (construction technology) on the overall quality of the building. Basic conditions for the quality use of the building: protection against insolation, moisture, noise, thermal protection, heating, ventilation and lighting in relation to the purpose of the building and the purpose of a particular space (room). (6 hours)
Theory and method of design: analysis of location, urban conditions, project program. Solving the relationship of the function of the building, the formation of functional groups and their interrelationship (on the example of housing). Dimensioning of rooms/spaces based on its function: by the method of equipment dimensions + usable space + space for movement. Technical conditions of construction, standards, regulations. (6 hours)
Stramben buildings: economic, historical, sociological and other influences on the programming, design, construction and use of residential buildings. Typology of residential buildings. Individual residential buildings - family houses. (2 hours)

Transitional types of residential buildings. Multi-apartment buildings. (2 hours)
Public buildings (division, characteristics and typology). (2 hours)
Buildings for education. (2 hours)
Commercial buildings. Design specifics for office (administrative) buildings. (2 hours)
Outbuildings (industrial, agricultural). (2 hours)
Types of finishing works in the building industry. Materials for finishing work in construction. (4 hours)
Exercises and program development – preliminary design of a family house (30 hours)

1.5. Types of teaching (put X)	**x** lectures seminars and workshops **X** Exercises Distance education Field Teaching	**X** Standalone Tasks Multimedia & Network laboratory Mentoring work Other_____

1.6. Student obligations

Regular attendance at lectures and exercises. Independent development of the program task: Conceptual design of a family house. Written exam.

1.7. Student Work Tracking (Add X to the appropriate tracking format)

Attending classes	x	Teaching activity	x	Seminar paper		Experimental work	
Written exam	x	Viva voce		Assay		Research	
Project	x	Continuous Knowledge Assessment		Report		Practical work	

1.8. Assessment and evaluation of students' work during classes and at the final exam

STUDENT ACTIVITY	ECTS	LEARNING OUTCOME	TEACHING METHOD	EVALUATION METHOD	SCORE	
					Min	Max
Attendance and activity at lectures and exercises	2,0	1,2,3,4,5, 6,7	Conversations, group discussions	Recording attendance and activities	3	10
Project	1,5	5,6,7	Problem solving, design, project development	Continuous monitoring of work, final evaluation of the project	16	30
Written exam	1,5	1,2,3,4,7	Solving tasks	Review and Assessment of the Written Examination	32	60
					51	100

1.9. Required reading and number of copies in relation to the number of students currently attending classes in the course

Title	Number of copies	Number of students
Neufert, E; Elements of Architectural Design, Technical Book, Zagreb, 2002	6	40
Knežević, G; Kordish, I; Residential and Public Buildings, Tehnička knjiga, Zagreb, 1987.	10	40
Knežević, G; Residential buildings, Tehnička knjiga, Zagreb, 1989	2	40
Faculty of Civil Engineering Osijek; Construction, (internal script)	1	40

1.10. Supplementary literature

Galić, M; Dolaček-Alduk, Z; Burilo, D; Knežević, A; Finishing Works in Building Construction – Cost Planning, e-gfos, Osijek, 4/2012

Strižić, Z; On Housing, Publishing House of the Association of Croatian Architects, Zagreb, 1997. Physical Planning Act (Official Gazette No. 153/2013, 65/17, 114/18, 39/19, 98/19, 67/23) Construction Act (Official Gazette No. 153/2013, 20/17, 39/19, 125/19)
1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies
Conducting university surveys on teachers and faculty surveys on subjects. Evaluation of students' performance in the development of the assigned program and in the written exam and feedback from students during and after classes for the purpose of teacher self-evaluation.