



Civil Engineering, professional undergraduate study -learning outcomes-

1st Semester

29527 Geology for Civil Engineers* 4.0 ECTS

1. describe and analyze the structure of the Earth, especially the lithosphere
2. interpret processes and phenomena on the surface of the lithosphere, describe the origin of individual processes in the lithosphere
3. recognize the physical and mechanical properties of rocks and soils
4. analyze, compare and calculate hydrogeological parameters
5. analyze, compare and determine geomorphological parameters
6. explain and use a geological map
7. recognize and describe engineering geological investigation works and geotechnical models

129529 Chemistry* 4.0 ECTS

1. recall the basics of general chemistry and concepts in chemistry
2. apply chemical calculations in construction (calculate composition, concentration, proportions, etc.)
3. describe the types of chemical bonds
4. distinguish the structures of solids
5. group construction materials by type and define their properties
6. define the types of corrosion of construction materials and explain methods of protection

129531 Mathematics I* 6.0 ECTS

1. describe the set of natural, integer, rational, real and complex numbers, define arithmetic operations and calculate in the given sets of numbers.
2. relate the trigonometry of right and obtuse triangles to everyday life and profession.
3. explain the concepts of matrices and determinants, list their properties and use them in the calculus of matrices and determinants.
4. distinguish between methods for solving systems of linear equations and solve systems of linear equations.
5. list and describe operations with vectors, calculate and apply scalar, vector and mixed products in specific examples.
6. explain and apply the basic concepts of real functions of a real variable, analyze elementary functions and sketch their graphs.
7. define a sequence, calculate the limit values of sequences and functions.
8. use the rules of differentiation to calculate the derivatives of explicitly and implicitly given functions.

129533 Descriptive Geometry* 6.0 ECTS

1. - determine the connection between individual types of projections, and list and describe basic geometric constructions
2. - draw a point, a length, a line and a plane in Monge's projection
3. - draw a side view and a profile view of a point, a length, a figure and geometric solids



4. - explain the relationships between geometric structures, two planes and a line and a plane
5. - draw oblique axonometry of geometric solids and sections of solids with a projecting plane
6. - formulate general and particular solutions to spatial problems using the constructive method and creating real or virtual models

129540 Technical Mechanics I* 5.0 ECTS

1. - draw a static diagram of a real system
2. - define and explain the conditions of equilibrium of a system
3. - analyze the equilibrium of a system
4. - apply trigonometric and vector calculus
5. - sketch a position plan and force polygon
6. - apply analytical, graphical and graphoanalytic methods
7. - distinguish between static equilibrium and the so-called quasi-static equilibrium

2nd semester

129551 Ethics* 2.0 ECTS

1. define the difference between the terms ethics and morality
2. describe ethical theories
3. compare ethical theories
4. define ethical principles
5. analyze human rights of different generations

129557 Mathematics II* 6.0 ECTS

1. apply differential calculus to determine limits and tangent and normal equations.
2. apply differential calculus to analyze the graph of a function.
3. define a primitive function and an indefinite integral, and determine a primitive function using basic integration properties.
4. apply basic integration methods to different types of functions.
5. calculate the area of a figure bounded by curves, the length of an arc of a curve, and the volume of solids of revolution.
6. explain the concept of a differential equation and solve basic differential equations.
7. apply the tangent method to solve nonlinear equations.

129562 Technical Mechanics II* 5.0 ECTS

1. - define and distinguish types of load-bearing linear beams and structures
2. - select and draw the basic static system of beams and their supports
3. - determine and explain all loads on given beams. Select and use common tables of loads from regulations
4. - solve statically determined load-bearing linear systems by determining support forces and all diagrams of internal forces
5. - recognize, explain and analyze statically indeterminate load-bearing systems and devise possible replacements of them with statically determined systems
6. - recognize and compare the advantages and disadvantages of both systems and conclude when such replacements can be considered



7. - analyze and distinguish equilibrium states, and calculate and verify the stability and safety of given load-bearing systems and beams
8. - recognize and calculate the geometric characteristics of plane cross-sections of linear beams as preparation
for the following courses in the field of load-bearing capacity of building structures

Building Construction

5th semester

129679 Spatial Planning and Urbanism* 3.0 ECTS

1. - explain theoretical principles and problems in spatial planning and urbanism orally, in writing and graphically
2. - distinguish the characteristics of spatial planning documentation and define the bearers of their preparation and implementation
3. - interpret basic spatial planning conditions when developing construction projects
4. - determine the necessary planning and legislative activities based on construction and urban regulations when preparing spatial planning documentation

129680 Foundations* 5.0 ECTS

1. define and describe shallow and deep foundations.
2. sketch all types of shallow and deep foundations.
3. relate geotechnical field experiments to the needs of building foundations.
4. calculate the amount of water flow into a construction pit
5. calculate the stability of a construction pit, the bearing capacity of anchors, the bearing capacity of piles.
6. solve an example of protecting a construction pit near buildings
7. solve the method of foundation on compressible soil.

129681 Environmental Protection* 3.0 ECTS

1. explain what ecology is and what environmental protection is
2. identify the basics of environmental protection in construction
3. describe the components of the environment (soil, water, air...) and recognize their protection measures
4. categorize methods of water and air purification
5. define types of landfills and describe types of waste and methods of waste management
6. demonstrate the impact of the project on the environment and protection measures

6th semester

129690 Earthquake Engineering* 4.0 ECTS

1. - describe the causes of earthquakes
2. - explain the effects of earthquakes on buildings
3. - define and apply D'Alembert's principle



4. - calculate the period and frequency of vibration of a building model using a seismological map
5. - check the stability of simpler buildings to an earthquake of a certain intensity

129696 Finishing Works and Installations * 3.0 ECTS

1. - explain the functional, technical and aesthetic requirements for the final structures of a building
2. - draw details of multi-layered walls, flat and pitched roofs, floors and ceiling coverings using different materials with regard to functional and aesthetic requirements
3. - connect the acquired knowledge about materials, technical conditions and methods of execution of final structures to analyze the quality of physical and technical solutions for different designs of floors, pitched and flat roofs, facades and protection of the building from ground moisture
4. - discuss examples of solutions for water supply, sewage and gas installations in construction substrates

CONSTRUCTION ENGINEERING

5th semester

129683 Geotechnics* 5.0 ECTS

1. define and describe shallow and deep foundations
2. sketch all types of shallow and deep foundations
3. calculate the amount of water flow into the construction pit, the stability of the construction pit, the load-bearing capacity of anchors, the load-bearing capacity of piles.
4. solve the method of stabilizing an example of a landslide
5. choose a method of foundation on compressible soil.
6. describe and choose geosynthetics based on examples
7. choose and analyze the method of construction of embankments: embankments, dams, etc.

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129688 Regulations and Meliorations* 4.0 ECTS

1. identify and explain basic watercourse regulation systems
2. verify watercourse regulation design
3. select a watercourse regulation option
4. categorize materials for regulation structures
5. analyze engineering views of watercourses
6. verify watercourse flows in the bed



7. illustrate a view of watercourse sediment transport

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129705 Waste Management* 3.0 ECTS

1. explain the regulations governing waste management in the republic of croatia
2. describe the technological processes of waste treatment
3. group waste into classes according to the properties that affect human health and the environment
4. categorize general conditions for landfills
5. distinguish and define the role of individual structural elements of a landfill
6. name the order of priority of waste management
7. analyze the stability of the landfill body

129698 Concrete Constructions II* 3.0 ECTS

1. - calculate all actions on the concrete structure
2. - check the load-bearing capacity of the element according to limit state methods
3. - categorize prestressing systems
4. - analyze the load-bearing capacity of slender elements
5. - analyze the interaction between the element-foundation-soil
6. - draw reinforcement plans with a statement of quantities for the entire structure
7. - assess the obligations, tasks and actions of the engineer in the construction process