

REYKJAVIK UNIVERSITY

School of Science and Engineering

Civil Engineering BSc

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ENGINEERING

The School of Science and Engineering offers programs in engineering in three disciplines rooted in traditional trades: Civil Engineering, Mechanical Engineering and Electrical Engineering. Students can take a final examination after 3,5 years and/or a master's degree after 5 years. The goal is to provide specialized and practical knowledge so that graduates are well prepared for employment and participation in industry. A major emphasis is on the students working on practical, realistic projects that are based on the teachers' knowledge from industry. By far the majority of the teachers have considerable experience of design, production or construction. The students enrolled are in many instances qualified tradesmen or have work experience in their field and the program enhances that background.

The programs open diverse employment opportunities in all three disciplines as there is a very high demand for individuals with this education, in Iceland as well as abroad. There are also numerous opportunities for further studies.

The admittance criteria is a matriculation examination with emphasis on mathematics and physics, or a comparable examination, as well as 6 months of practical work experience in the field. Students who do not have such experience at the start of their studies can obtain experience by work in the summer periods during the studies. Applicants not having the adequate theoretical basis are offered supplementary courses at RU's preliminary studies program.

The final examination in Engineering BSc of 210 ECTS credits is completed in 3,5 years and gives very considerable professional competences seen in relation to the duration. Those graduating from this study program receive accreditation from the Icelandic Ministry of Industry to practice as fully qualified engineers, with the professional title of engineer (Icelandic: Tæknifræðingur) which is protected by law. At the same time it is easy to base studies for a MSc degree on the final examination, either in Iceland or at universities abroad.

In the study program, great emphasis is placed on the students' work on practical projects in cooperation with engineering firms and research institutes. The students final project of 12 credits (24 ECTS) is a design and/or research project with emphasis on independent and goal oriented methods in practical project work in the industry.

On July 1st, 2005 Reykjavik University merged with the Technical University of Iceland where teaching in the engineering programs which form the basis for today's programs in Civil Engineering, Mechanical and Energy Engineering and Electrical Engineering started in 1964. These programs have a strong tradition of practical orientation in cooperation with the industry. Practically oriented project work plays a large role in the students' studies and most of the teachers have a background of practical experience in the industry. The research focus is mainly on applied research in cooperation with specialized companies and institutions in the respective fields.

The first programs for the MSc degree in Engineering started in January 2006. These are for Civil Engineers, but in 2007-2008 it is planned to start MSc programs for Mechanical and Energy Engineers and Electrical Engineers. For those having completed the final examination in Engineering BSc at Reykjavik University or at the former Technical University of Iceland (210 ECTS) the master's programs take three semesters. For those having a bachelor's degree in engineering of 180 ECTS the master's programs take four semesters.

Civil Engineering BSc

Civil engineering deals with the design of structures such as buildings, road work and hydropower plants, as well as project planning and supervision. Most civil engineers are employed as structural designers with engineering firms or as leaders of construction projects with contractors or public authorities. Structural analysis, materials science, geotechnics, construction management and road design are key subjects in civil engineering.

In the first 6 semesters, students generally take five courses per semester (6 ECTS each). Four courses are taught during the first 12 weeks of the semester (6 ECTS each), ending with written or oral examinations. After the examination period comes a three-week lab course (6 ECTS) or a three-week specialized course (6 ECTS). In the 7. semester students take a course in research methods (6 ECTS) and work on a specialized final project (24 ECTS).

During the 5. and 6. semester students take elective subjects that offer a degree of specialization. Three fields of specialization offered; Structural Design, Construction Management and Installation Systems. A student who chooses at least 3 elective courses, as well as his final project, in the the same field of specialization gets a certificate of graduation in which his field of specialization is especially noted.

In addition to elective subjects within the field of civil engineering, a final year student can choose one course from other programmes at Reykjavik University or at another university. Any cost resulting from studying outside the RU is borne by the student.

Civil Engineering – Courses

Civil Engineering 210 ECTS credits

1. semester

Mathematics
Physics
Structural Mechanics
Computer Aided Drawing and Design

Computer Science 3 weeks

2. semester

Mathematics
Mechanics of Materials
Hydraulics
Materials Science of Metals and Timber

Building Technology – Computer Aided Design 3 weeks

3. semester

Mathematics
Structural Mechanics
Materials Science of Concrete
Geology and Soil Mechanics

Project Management and Construction 3 weeks

4. semester

Structural Engineering – Finite Element Method
in Structural Design
Reinforced Concrete – Structural Design
Road Design and Construction
Building Physics – Heating

Surveying and Measuring Techniques 3 weeks

5. semester

Operations Research or Structural Analysis
Timber and Steel – Structural Design
Installation Systems
Geotechnical Engineering

Management and Innovation 3 weeks

6. semester

Environmental Sciences
Three elective courses in Structural Design,
Installation Systems or Construction, see
elective course descriptions.

Interdisciplinary Project 3 weeks

7. semester

Research Methods in Engineering

Final Project 15 weeks

STUDY PLANS IN CIVIL ENGINEERING

Civil Engineering: A 7 semester BSc Program

	Fall	Spring	Fall	Spring
	BT1 1. semester	BT2 2. semester	BT3 3. semester	BT4 4. semester
Core Courses				
Computer Science	RT TLV 1003			
Physics	AT EDL 1003			
Computer Aided Drawing	BT TEI 1013			
Mathematics	AT STÆ 1003	AT STÆ 2003	AT STÆ 3003	
Structural Mechanics/Analysis	BT BUP 1013	BT BUP 2013	BT BUP 3202	BT BUP 4203
Structural Analysis – loads/safety			BT BUP 3201	
Building Technology		BT BFR 1013		
Materials Science		BT EFN 1013	BT EFN 2013	
Hydraulics		BT REN 1003		
Project Management			AT VST 1003	
Soil Mechanics/Geology			BT JTÆ 1003	
Road Design				BT VEG 1003
Reinforced Concrete				BT SST 1013
Heating/Building Physics				BT HIT 1003
Surveying and Measurement				BT LAM 1013

	BT5 5. semester	BT6 6. semester	BT7 7. semester
Core Courses:			
Management/Innovation	AT RSN 1003		
Design of Timber and Steel Structures	BT BYG 1003		
Geotechnical Engineering	BT JTÆ 2013		
Installation Systems	BT LAG 1003		
Interdisciplinary Project		BT VEK 1003	
Environmental Sciences		BT UMH 1003	
Final Project			BT LOK 1012
Research Methods in Engineering			AT ADF 1003
Structural Design:			
Structural Engineering	BT BUP 5003		
Design of Timber and Steel Structures		BT BYG 2013	
Reinforced Concrete		BT SST 2013	
Earthquake and Fire Resistant Design		BT JAR 1003	
Building Technology		BT BFR 2013	
Construction/Installations:			
Operations Research	VT AØG 1003		
Road Construction		BT VEG 2003	
Construction Management		BT FRK 3003	
Heating/Ventilation		BT LAG 2003	
Water Supply/Wastewater Disposal		BT LAG 3003	
Operations Research/Simulation		VT AØG 2003	

COURSE DESCRIPTIONS IN CIVIL ENGINEERING

RT TLV 1003 **Computer Science** credits [ECTS:6]

Year of study: First year.

Semester: Fall.

Level of course: First cycle - Introductory.

Type of course: Core.

Prerequisites: None.

Schedule: 15 lectures and 15 practical lessons per week for 3 weeks.

Lecturer: Elín K. Sighvatsdóttir BS, MBA. Ágúst Valfells PhD, Assistant Professor.

Learning outcome: On completion of the course students should:

- be familiar with the computers' structure and their main operating systems.
- be familiar with data structures, methods and operating commands and be able to program in Java.
- be able to use Matlab and Excel when solving actual problems and be able to program in Visual Basic.

Content: Fundamentals of computers, introduction to operating systems and computer net systems. Object oriented programming with Java: Data structures (primitive variables, constants, classes, objects, arrays and strings), methods, control statements and program flow, inheritance, interfaces, polymorphism. Graphical user interfaces, layoutmanagers, applets. Program structure and documentation. Introduction to Matlab and its use in solving mathematical problems. Use of Excel in solving technical problems, programming in Visual Basic. During the course the emphasis is on solving practical problems.

Reading material: Daniel Liang, *Introduction to Java Programming*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 3 hour written examination counts 70% and exercises 30% of final grade.

Language of instruction: Icelandic.

AT EDL1003 **Physics** 3 credits [ECTS:6]

Year of study: First year.

Semester: Fall.

Level of course: First cycle - Introductory.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 2 practical lessons per week for 12 weeks. 10 laboratory lessons.

Lecturer: Haraldur Auðunsson PhD, Associate Professor.

Learning outcome: On completion of the course students should:

- have an understanding of the fundamental principles of physics and be able to apply these to the solving of technical problems.
- have the necessary basic knowledge to be able to assimilate the contents of engineering subjects.

Content: Physical quantities and units. Motion in one, two and three dimensions. Newton's laws of motion. Work, kinetic and potential energy. Energy conservation. Momentum, impulse and

collisions. Dynamics of rotational motion. Conditions for equilibrium. Elasticity. Gravitation. Periodic motion and waves. Fluid mechanics. Electromagnetic induction, inductance and alternating current. Magnetic circuits. Laboratory work (3 experiments) and weekly due exercises.

Reading material: Young og Freedman, *University Physics*.

Teaching and learning activities: Lectures, practical sessions and laboratory work.

Assessment methods: A 3 hour written exam counts for 80% of the final grade. Laboratory work and due exercises count for 20%.

Language of instruction: Icelandic.

BT TEI1013 Descriptive Geometry and AutoCAD 3 credits [ECTS:6]

Year of study: First year.

Semester: Fall.

Level of course: First cycle - Introductory.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Róbert Pétursson M.Arch, Associate Professor. Runólfur Skaftason BSc.

Learning outcome: On completion of the course students should:

- be able to use the programme AutoCad in the preparations of drawings, in two as well as in three dimensions.
- be able to use freehand sketches for explanation and communication at the worksite.
- have trained his spatial perception.

Content: Descriptive geometry 33%: Sketching, perspective drawing. Rectangular projections, Isometric and dimetric projections.

Computer Aided Drawing 67%: The AutoCAD program. Computers and operating system, setting up, drawing-operations, blocks and dimensions. Layers, area limits, viewports, Paper Space, Model Space, X-ref and introduction to 3-D. Printing and plotting. Rectangular, isometric and diametric projections.

Reading material: Lagerquist, *Projektionslära*. Róbert Pétursson, *Fríhendingsteikning og fjarvíddarteikning*. AutoCAD Manuals.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: Written examinations count for 70% and exercises for 30% of final grade.

Language of instruction: Icelandic.

AT STÆ1003 Mathematics I 3 credits [ECTS:6]

Year of study: First year.

Semester: Fall.

Level of course: First cycle - Introductory.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Sæmundur Kjartan Óttarsson, PhD, Associate Professor.

Learning outcome: On completion of the course students should:

- have an understanding of the fundamental principles of mathematics and be able to apply these to solving technical problems.
- have the necessary basic knowledge to be able to assimilate the contents of engineering subjects.

Content: Vectors and geometry. Complex numbers. Functions of one variable: Limits and continuity. Inverse functions. Differentiation. Related rates of change. Extreme values. l'Hôpital's rule. Functions of more than one variable: Limits and continuity. Partial derivatives. Gradient. Chain rule. Directional derivatives. Linear approximation. Extreme values (for functions of two variables). Lagrange multipliers. Parametrized curves. Curves in polar coordinates. Basic integration of functions of one or two variables with applications. Transcendental functions.

Reading material: Sæmundur Kjartan Óttarsson, *Fyrirlestrar í stærðfræði I*. Murray Spiegel, *Schaum's Mathematical Handbook of Formulas and Tables*, 2nd Edition. Robert A. Adams, *Calculus, A Complete Course*, 5th Edition.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 4 hour written examination counts 90% and due exercises 10%.

Language of instruction: Icelandic.

BT BUP1013

Statics

3 credits [ECTS:6]

Year of study: First year.

Semester: Fall.

Level of course: First cycle - Introductory.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Guðbrandur Steinþórsson, Cand.Polyt, Associate Professor.

Learning outcome: On completion of the course students should:

- be familiar with and able to analyse statical determinacy and/or indeterminacy of commonly occurring types of structures.
- be able to calculate support reactions and internal forces, i.e. bending moment, shear force and normal force, in statically determinate beams and frames and in common types of two- and three-dimensional trusses .

Content: Statics. Force systems in two and three dimensions. Equilibrium. Statically determinate structures. Beams, trusses and frames. Stability of structures. Distributed forces, internal effects. Normal force, shear force and moment diagrammes. Centroids. Moments of inertia. 8 due exercises.

Reading material: Meriam og Kraige, *Engineering Mechanics - Volume 1, Statics*, 6th Edition. Material from teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 4 hour written examination counts 100%.

Language of instruction: Icelandic.

AT STÆ2003**Mathematics II**

3 credits [ECTS:6]

Year of study: First year.**Semester:** Spring.**Level of course:** First cycle - Intermediate.**Type of course:** Core.**Prerequisites:** None.**Schedule:** 4 lectures and 3 practical lessons per week for 12 weeks.**Lecturer:** Sæmundur Kjartan Óttarsson PhD, Associate Professor.**Learning outcome:** On completion of the course students should:

- have an understanding of the fundamental principles of mathematics and be able to apply these to solving technical problems.
- have the necessary basic knowledge to be able to assimilate the contents of engineering subjects.

Content: Integration techniques, including substitution, integration by parts and partial fractions. Improper integrals. Numerical integration. Continuous probability distributions. Statistics: estimates of parameters, tests of hypotheses. Vector-valued functions of one variable (curvature etc). Level curves and surfaces. Tangent planes of surfaces. Curl and divergence. Potential functions. Line integrals. Surface integrals. Sequences and series: convergence tests, power series, Fourier series.

Reading material: Sæmundur Kjartan Óttarsson, *Fyrirlestrar í stærðfræði II*. Murray Spiegel, *Schaum's Mathematical Handbook of Formulas and Tables*, 2nd Edition. Robert A. Adams, *Calculus, A Complete Course*, 5th Edition. Erwin Kreyszig, *Advanced Engineering Mathematics*, 8th Edition.

Teaching and learning activities: Lectures and practical sessions.**Assessment methods:** A 4 hour written examination counts 90% and due exercises 10%.**Language of instruction:** Icelandic.**BT BUP2013****Mechanics of Materials**

3 credits [ECTS:6]

Year of study: First year.**Semester:** Spring.**Level of course:** First cycle - Intermediate.**Type of course:** Core.**Prerequisites:** BT BUP 1013.**Schedule:** 4 lectures and 3 practical lessons per week for 12 weeks.**Lecturer:** Guðbrandur Steinþórsson Cand.Polyt, Associate Professor.**Learning outcome:** On completion of the course students should:

- be familiar with the elastic behaviour of common structural materials.
- be able to identify and calculate section properties.
- be able to analyse stress and strain under uniaxial and biaxial conditions and determine principal stresses and directions.
- be able to calculate deformations in common statically determinate beam type structures.
- be acquainted with elastic buckling and be able to calculate critical loads for simple columns.

Lecturer: Jón Sigurjónsson Cand.Polyt.

Learning outcome: On completion of the course students should:

- have an understanding of the fundamental principles of materials science and be able to apply these to the solution of technical problems.
- have sufficient basic knowledge to be able to assimilate subjects of engineering such as structural design.

Content: : Metals: Steel, cast iron, aluminium and stainless steels. Production, properties and use. Introduction to plastics. Wood and wood products, timber and its properties as a building material. Diverse materials in the construction industry, properties and use: insulating materials, glass, joint materials, glue. Students perform laboratory experiments and write reports.

Reading material: Per Gunnar Burström, *Byggnadsmaterial – Uppbyggnad, tillverkning och egenskaper*. Material from teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 3 hour written examination.

Language of instruction: Icelandic.

BT REN1003

Hydraulics

3 credits [ECTS:6]

Year of study: First year.

Semester: Spring.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Jón Bernódusson Dipl.Ing.

Learning outcome: On completion of the course students should:

- have developed an understanding of the basic principles of hydraulics and be able to apply these to solving technical problems.
- have the necessary basic knowledge to assimilate the course contents of water supply and sewage systems, heating, ventilation, building physics, environmental science and hydro power works.
- be able to assess loads on structures caused by fluid pressure and fluid flow
- be able to dimension closed conduits and open channels and to evaluate the effects of changes in fluid pressure, velocity and roughness in closed conduits and open channels.
- be acquainted with the basis for design of conduit systems, dams, overflow weirs and bottom outlets,
- be acquainted with the basis for assessing the effects of ground water and ground water flow.

Content: Physical properties of water. Hydrostatics. Water pressure and water forces. Hydrodynamics. Water flow in pipes. Pipelines and pipe networks. Water pumps and turbines. Water flow in open channels. Hydraulic structures, dams weirs and spillways. Ground water hydraulics, permeability, flow nets. 8 due exercises.

Reading material: Hwang og Houghtalen, *Fundamentals of Hydraulic Engineering*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 3 hour written exam.

Language of instruction: Icelandic.

AT STÆ3003

Mathematics III

3 credits [ECTS:6]

Year of study: Second year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Sæmundur Kjartan Óttarsson PhD, Associate Professor.

Learning outcome: On completion of the course students should:

- understand the fundamental principles of mathematics
- be able to apply these to the solution of technical problem.
- have sufficient basic knowledge to be able to assimilate subjects of engineering such as structural design.

Content: Continuation of probability and statistics. Linear algebra, including vector spaces, matrices, systems of linear equations, determinants, eigenvalues and eigenvectors.

Differential equations. Laplace transform.

Reading material: Sæmundur Kjartan Óttarsson, *Fyrirlestrar í stærðfræði III*. Murray Spiegel, *Schaum's Mathematical Handbook of Formulas and Tables*, 2nd Edition. Robert A. Adams, *Calculus, A Complete Course*, 5th Edition. Erwin Kreyszig, *Advanced Engineering Mathematics*, 8th Edition.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: 4 hours written examination.

Language of instruction: Icelandic.

BT BUP3202

Structural Mechanics

2 credits [ECTS:4]

Year of study: Second year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: BT BUP 2013.

Schedule: 3 lectures and 2 practical lessons per week for 12 weeks.

Lecturer: Steindór Haarde MSc, Associate Professor.

Learning outcome: On completion of the course students should:

- understand the fundamental principles of structural analysis and be able to apply these to the solution of technical problems.
- have sufficient basic knowledge to be able to assimilate subjects of engineering such as structural design of concrete, timber and steel.

Content: The principle of virtual work. Statically indeterminate beams and trusses. The force method. Statically indeterminate frames. Yield line theory for plates. Frames.

Reading material: Ib Schmidt o.fl., *Deformationer og Kraftmetoden*. Gere og Timoshenko, *Mechanics of Materials*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: 3 hours written exam.

Language of instruction: Icelandic.

BT BUP3201 Structural Analysis - Loads and Safety 1 credits [ECTS:2]

Year of study: Second year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: BT BUP 2013.

Schedule: 3 lectures and 2 practical lessons per week for 6 weeks.

Lecturer: Guðbrandur Steinþórsson Cand.Polyt, Associate Professor.

Learning outcome: On completion of the course students should:

- understand the concepts of the basis for structural safety and actions and be able to apply these to the solution of engineering problems.
- have sufficient basic knowledge to be able to assimilate subjects of engineering such as structural design in concrete, steel and timber.

Content: An introduction to the probabilistic basis of structural design. Characteristic values of loads and material properties. The Eurocode EC 1: The use of the code, in particular concerning determination of imposed loads, wind loads and snow loads. Partial factors of safety, load values, load combinations. The use of safety factors in the design of structures in concrete, steel and timber and in the design of geotechnical structures.

Reading material: Guðbrandur Steinþórsson, *Leiðbeiningar um notkun hönnunarstaðla, THÍ 2003*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: Evaluation of projects counts 100%.

Language of instruction: Icelandic.

BT EFN2013 Materials Science of Concrete 3 credits [ECTS:6]

Year of study: Second year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: None.

Schedule: 5 lectures per week for 12 weeks plus 12 practical lessons at the Institute of Building Research in Keldnaholt.

Lecturer: Ólafur Wallevik Dr.Ing. Guðni Jónsson MSc. Helgi Hauksson MSc.

Learning outcome: On completion of the course students should:

- understand the fundamental principles of materials science and be able to apply these to the solution of technical problems.
- have sufficient basic knowledge to be able to assimilate of other engineering subjects.

Content: Concrete as a principal building material. Raw materials and production, cement, aggregate and admixtures. Properties of concrete. Concrete work. Testing of concrete, inspection and quality control. Students perform laboratory experiments and write reports.

Reading material: A.M. Neville, *Concrete Technology*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 3 hour written examination counts 100%.

Language of instruction: Icelandic.

AT VST1003

Project Management

3 credits [ECTS:6]

Year of study: Second year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: None.

Schedule: 15 lectures and 15 practical lessons per week for 3 weeks.

Lecturer: Eðvald Möller MSc, MBA. Part-time lecturers.

Learning outcome: On completion of the course students should:

- be familiar with the methodology of project management and have obtained skills in applying these to his field of discipline.
- be able to prepare tender documents, offers, workschedules and cost estimates for common and traditional projects and evaluate plans made by others.
- be able to apply the knowledge to the administration of construction and inspection on site.

Content: Methodology of project management and application. Defining the project, project life cycle, schedule, execution, progress and performance, report and sharing informations. Project networks, Gantt, CPM, PERT etc. Contracting documents, making bids and contracts, surveillance, project meetings. Cost planning and estimating, legal concern regarding projects and implementation of projects. Exercises with Microsoft Project. Students do a large project in construction.

Reading material: Gray and Larson, *Project Management*. Eðvald Möller, *Verkefnastjórnun með Microsoft Project*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 2 hour written examination counts 40%, grade for project work and oral examination counts 60% of final grade.

Language of instruction: Icelandic.

BT JTÆ1003

Geology and Soil Mechanics

3 credits [ECTS:6]

Year of study: Second year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks plus a geology day trip and 4 practical exercises in the Institute of Building Research in Keldnaholt. Geology is taught for the first 4 weeks of the semester and Soil Mechanics is then taught for 8 weeks.

Lecturer: Ingunn Sæmundsdóttir Dipl.Ing, Associate Professor. Þorbjörg Hólmeirsdóttir MSc.

Learning outcome: On completion of the course students should:

- know the properties of Icelandic rock and common Icelandic minerals and be able to assess their applicability in construction.
- know methods of research and testing of minerals and rock, be able to perform simple tests and assess the need for further tests.
- know the basis and methods in foundations design.
- be able to evaluate consolidation and the effects thereof.
- be able to design common types of foundations and have basic knowledge of related problems usually solved by experts.
- knows the stipulations of tender documents for earthworks and be able to perform inspection and supervision of common types of earthworks.

Content: The basics of geology incl. petrography, earthquakes, erosion,. Applied geology, evaluation of quarry sites. Classification of soils. Applicability of different types of soils, material testing. Bearing capacity of earthfills, strength, compacting, permeability and susceptibility to freezing. Stress distributions in soils. Consolidation. Settlement of fills and foundations.

Reading material: Coduto, *Geotechnical Engineering - Principles and Practices*. Material from teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: Grade in Geology counts 33% and grade in Soil Mechanics count 67% in final grade. 1,5 hour written examination in Geology after the 4th week and a 3 hour written examination in Soil Mechanics after 12 weeks. Exercises count for 20% in final grade in each part.

Language of instruction: Icelandic.

BT BUB4203

Structural Analysis - FEM

3 credits [ECTS:6]

Year of study: Second year.

Semester: Spring.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: . Steindór Haarde MSc, Associate Professor. Eyþór R. Þórhallsson MSc, Associate Professor.

Learning outcome: On completion of the course students should:

- have an understanding of the fundamental principles of structural analysis and be able to apply these to the solution of technical problems.
- have sufficient basic knowledge to be able to assimilate subjects of engineering such as structural design of concrete, timber and steel.
- be acquainted with the Finite Element Method and the use of FEM computer programs in structural analysis and design.

Content: Moment distribution due to thermal strain and settlement of supports. Frame analysis with the slope-deflection method. Elastic stability, buckling of columns. Yield hinges in beams. Introduction to dynamics and the dynamic analysis of structures. Introduction to the FEM method and the use of FEM computer programs.

Reading material: Gere og Timoshenko, *Mechanics of Materials*. Guðbrandur Steinþórsson, *Formbreytingaraðferðin* and *Nokkur orð um brot bita og ramma*. Material from teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment: A 3 hour written examination.

Language of instruction: Icelandic.

BT VEG1003 **Road Design** 3 credits [ECTS:6]

Year of study: Third year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Björn Ólafsson MSc.

Learning outcome: On completion of the course students should:

- have an understanding of the fundamental principles of road design and can apply these to the solution of technical problems.
- be able to design roads and minor traffic structures.

Content: The preparation, design and execution of roads and minor traffic structures. Road standards, calculation of road geometry, crossings and joining of roads. Capacity of bearing layers, lower and upper layers.

Reading material: *Íslenskur vegstaðall*. Material from teacher. Instruction manuals for computer programs in road construction.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 3 hour written examination counts for 60% and eight quizzes count for 40%.

Language of instruction: Icelandic.

BT SST1013 **Reinforced Concrete I** 3 credits [ECTS:6]

Year of study: Second year.

Semester: Spring.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: BT BUP 3202, 3201 and 4203.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Eyþór R. Þórhallsson MSc, Associate Professor.

Learning outcome: On completion of the course students should:

- understand the fundamental principles of structural design in concrete and be able to apply these to the solution of technical problems.
- be able to design smaller concrete structures.

Content: The principles of the behaviour of reinforced concrete. Introduction to design codes (ENV's). analysis of limit states, (SLS, ULS), design for bending, axial force, shear, torsion and combinations hereof. Detailing of reinforced concrete.

Reading material: O'Brien & Dixon, *Reinforced and Prestressed Concrete Design*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: Project work and oral examination counts for 100%.

Language of instruction: Icelandic.

BT HIT1003 Heating and Building Physics 3 credits [ECTS:6]

Year of study: Second year.

Semester: Spring.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Guðmundur Hjálmarsson BSc, Assistant Professor.

Learning outcome: On completion of the course students should:

- have an understanding of the principles of building physics and be able to apply these to the solution of technical problems.
- have acquired the necessary basic knowledge to be able to assimilate the contents of other engineering subjects.
- be able to design traditional heating systems.

Content: The basic principles of building physics, transfer of heat, humidity and their interdependence. Energy balance in buildings and heating requirements. An introduction to acoustics. Thermal insulation, calculation of heat transfer. Design of heating system and selection of installations.

Reading material: Lohmeyer, *Praktische Bauphysik*. Guðmundur Halldórsson & Jón Sigurjónsson, *Varmaeinangrun húsa og Hitun húsa*. Ragnar Gunnarsson, *Lagnaþekking, - Vitneskja - reynsla - umhverfi*. Danish standard, *ÍST/DS 418, 6. ed. Byggingareglugerð. Reglugerð um vatnshitunarkerfi, önnur en jarðvarmaveitur*. Teknisk Forlag, *Varme stábi*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 1,5 hour written examination in Building Physics counts 50% and project work in Heating 50%.

Language of instruction: Icelandic.

BT LAM1013 Surveying and Measuring Techniques 3 credits [ECTS:6]

Year of study: Second year.

Semester: Spring.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: None.

Schedule: 15 lectures and 15 practical lessons per week for 3 weeks.

Lecturer: NA.

Learning outcome: On completion of the course students should:

- be able to perform customary measurements and setting out on site for building projects and earth works.
- have sufficient knowledge in surveying and mapping to be able to analyse related problems, assess the need for assistance and seek specialist advice.

Content: Instruments, errors and calibration. The coordinate systems. Conventional methods of surveying. Measuring methods using electromagnetic waves.

5 practical surveying problems in the field (each 2 days surveying on the average). Triangulation, polygon, distance, levelling, optical square, various setting-out problems, line surveying and tacheometry. Practical use of different instruments and methods. Checking results, errors and accuracy valued. Calculation, mapping and reports.

Reading material: Terje Skogseth, *Grunnleggende landmåling*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 2 hour written examination counts 30%. Project work and oral examination counts 70%.

Language of instruction: Icelandic.

AT RSN1003 Management and Innovation 3 credits [ECTS:6]

Year of study: Third year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: None.

Schedule: 15 lectures and 15 practical lessons per week for 3 weeks.

Lecturer: Páll Kr. Pálsson Dipl.Ing.

Learning outcome: On completion of the course students should:

- have sufficient knowledge in management, administration and finance of companies to lead the operation of smaller industrial enterprises, with emphasis on innovation.

Content: The course will give an overview of the running and managing business entities, including planning, cost analysis, human resource management and the role of managers and directors. The importance of continuous innovation is emphasised and related to the corporate lifecycles. As a practical project the students will develop a full business plan for a start-up or mature company.

Reading material: *Harvard Business Review*, *Entrepreneurship*. Material from teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 3 hour written examination counts 40% and projects 60%.

Language of instruction: Icelandic.

BT BUP5003 Structural Engineering 3 credits [ECTS:6]

Year of study: Third year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Elective.

Prerequisites: BT BUP 1013, BT BUP 2013.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks. This course is obligatory for those who choose Structural Analysis as their field of specialization.

Lecturer: Hafsteinn Pálsson PhD.

Learning outcome: On completion of the course students should:

- understand of the basis of the stiffness method and be able to apply that method in analysing and designing structures.
- understand the basis of FEM software for structural analysis in relation to the stiffness method.
- understand the basis of dynamics and be able to apply that knowledge to the dynamic analysis of structures i.e. in earthquake resistant design.

Content: Matrix analysis of beams, trusses and frames using the stiffness method. The method of finite elements for the analysis of structures in 2 and 3 dimensions. Introduction to dynamics and the dynamic analysis of structures.

Reading material: Gere og Weaver, *Matrix Analysis of Framed Structures*. Timoshenko, Young og Weaver, *Vibration Problems in Engineering*. Material from teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: 4 hours written examination counts 70% and projects 30%.

Language of instruction: Icelandic.

VT AÐG1003 Operations Research 3 credits [ECTS:6]

Year of study: Third year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Elective.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Sigurður Óli Gestsson CSc.

Learning outcome: On completion of the course students should:

have developed skills in different methods of optimisation and simulation and be able to use optimisation software to solve actual problems.

Content: Production problems and common operations research models. Linear programming, the simplex method, dual problems, sensitivity analysis. Distribution methods, network planning. Integer programming, Queuing theory. Inventory Management and case study of real problems regarding Inventory management and optimisation of fleet management.

Reading material: Hillier og Lieberman, *Introduction to Operations Research*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: 4 hours written examination counts 70% and projects 30%.

Language of instruction: Icelandic.

BT BYG1003 Design of Timber and Steel Structures I 3 credits [ECTS:6]

Year of study: Third year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: BT BUP 3202, 3201 and 4203 or 4202.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Steindór Haarde MSc, Associate Professor. Friðberg Stefánsson PhD.

Learning outcome: On completion of the course students should:

- have an understanding of the fundamental principles of structural design in timber and steel and be able to apply these to the solution of technical problems.
- be able to design smaller timber- and steel structures.

Content: Design codes (ENV's). Timber structures: Classification of timber, design of common structural elements, such as beams and columns of plain timber and laminates. Roof constructions. Connections of structural elements. Steel structures: The properties of steel, the design of common structural elements as beams and columns subjected to bending, shear and axial force. Bolted and welded connections.

Reading material: *ENV 5 (Evrópustaðall um timbur). Timber Engineering (Step 1)*. Bjarne Chr. Jensen, *Stålkonstruktioner. ÍST DS 412:1998*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 4 hour written examination counts 60% and projects count 40% of final grade.

Language of instruction: Icelandic.

BT JTÆ2013 Geotechnical Engineering 3 credits [ECTS:6]

Year of study: Second year.

Semester: Spring.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: BT JTÆ 1003, BT BUP 3201.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Ingunn Sæmundsdóttir Dipl.Ing, Associate Professor. Oddur Sigurðsson MSc.

Learning outcome: On completion of the course students should:

- be able to perform geotechnical design of traditional foundations for buildings, basement walls, retaining walls and earthfill.
- know the basis for and the design methods for constructions usually performed by specialists, such as steel pilings and anchors, dams and quays.

Content: Foundations, traditional and pile foundations. Safety; partial coefficients and load combinations. Earth pressure, retaining walls. Steel pilings and anchors. Stability of earth fills. Dams and harbours.

Reading material: Coduto, *Foundation Engineering - Principles and Practices*. *Geo-Slope and Geo-Seep*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 3 hour written examination counts 80% and exercises 20% of final grade.

Language of instruction: Icelandic.

BT LAG1003

Installation Systems

3 credits [ECTS:6]

Year of study: Third year.

Semester: Fall.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: BT REN 1003.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Guðmundur Hjálmarsson BSc, Assistant Professor. Part-time lecturers.

Learning outcome: On completion of the course students should:

- have an understanding of the fundamental principles of installations and be able to apply these to the solution of technical problems.
- be able to design smaller installation systems for water supply.
- be able to design smaller installation systems for wastewater disposal.

Content: Water supply and wastewater disposal: Water and wastewater installations in and around buildings. Design criteria and methods. Water requirements for dwellings and industrial buildings. Materials for use in installations. Electrical installations in buildings.

Reading material: From teacher

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: Oral examination counts 60% and projects count 40%.

Language of instruction: Icelandic.

BT UMH1003

Environmental Sciences

3 credits [ECTS:6]

Year of study: Third year.

Semester: Spring.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 2 practical lessons per week for 12 weeks.

Lecturer: Kjartan Bollason MSc a.o.

Learning outcome: On completion of the course students should:

- have an understanding of the principles of environmental science and planning and can apply these to the solution of technical problems.
- have acquired the necessary basic knowledge to be able to assimilate the contents of other engineering subjects.

Content: Ecology, the bio chain. Energy production and use. Water pollution, use of water, protection of resources. Biological and chemical pollution. Processing of waste. The atmosphere, air pollutants and their effects. Acid rain, greenhouse effect, disruption of the ozone layer. Methods and equipment for pollution measurements. Assessment of the effects

of construction works on the environment. An introduction to regional, urban and town planning procedures. Building regulations.

Reading material: Sue Roaf, *Ecohouse 2: A Design Guide*. Material from teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 3 hour written examination counts 80% and exercises 20% of final grade.

Language of instruction: Icelandic.

BT VEK1003 Interdisciplinary Project 3 credits [ECTS:6]

Year of study: Third year.

Semester: Spring.

Level of course: First cycle - Intermediate.

Type of course: Core.

Prerequisites: BT BYG 1003 and BT SST 1003.

Schedule: 20 practical lessons per week for 3 weeks. Students finish 2 projects.

Lecturer: Steindór Haarde MSc, Associate Professor. Guðbrandur Steinþórsson Cand.Polyt, Associate Professor.

Learning outcome: On completion of the course students should:

- have training in the use of independent and goal oriented methods in practical project work in the structural design of buildings.
- have obtained an overview of the field through the interaction of courses where he applies knowledge from all the subjects previously studied.

Content: The students work in groups of 3 - 4 on a project in structural design of a building in concrete, steel and timber. The students write a report on a subject covering one or more areas of Civil Engineering.

Reading material: Information from teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: Evaluation of reports, presentations by individual students and the group as a whole counts 100%.

Language of instruction: Icelandic.

BT BYG2013 Design of Timber and Steel Structures II 3 credits [ECTS:6]

Year of study: Third year.

Semester: Spring.

Level of course: First cycle - Advanced.

Type of course: Elective.

Prerequisites: BT BYG 1003, BT BUP 4202.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Steindór Haarde MSc, Associate Professor. Friðberg Stefánsson PhD.

Learning outcome: On completion of the course students should:

- be familiar with the basis of structural design in timber and steel.
- be able to structurally design structures in timber and steel.

Content: Structural design of timber and steel structures. Timber: Constructions in laminated wood (glulam), beams, frames and arches. Steel structures: Beams, frames and trusses; joining of structural members. The use of various FEM programmes in structural design.

Reading material: *ENV 5 (Evrópustaðall um timbur). Timber Engineering (Step 1 and Step 2).* Bjarne Chr. Jensen, *Stålkonstruktioner. ÍST DS 412:1998.*

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: Evaluation of two large design projects counts 100%.

Language of instruction: Icelandic.

BT SST2013 Reinforced Concrete II 3 credits [ECTS:6]

Year of study: Third year.

Semester: Spring.

Level of course: First cycle - Advanced.

Type of course: Elective.

Prerequisites: BT SST 1013, BT BUP 5013.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Eyþór R. Þórhallsson MSc, Associate Professor.

Learning outcome: On completion of the course students should:

- be familiar with the basis of structural design in reinforced concrete.
- be able to complete the design of structures in reinforced concrete.

Content: Concrete structures: Slabs analysed and designed using yield line methods. Pre- and post-tensioned structural members. Creep, shrinkage and relaxation, cracking. Yield line theory for plates. Introduction to computer programmes for structural analysis.

Reading material: O'Brien og Dixon, *Reinforced and Prestressed Concrete Design.*

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: Project and oral defense counts 100%.

Language of instruction: Icelandic.

BT JAR1003 Earthquake and Fire Resistant Design 3 credits [ECTS:6]

Year of study: Third year.

Semester: Spring.

Level of course: First cycle - Advanced.

Type of course: Elective.

Prerequisites: BT SST 1013.

Schedule: 4 lectures and 2 practical lessons per week for 12 weeks.

Lecturer: Eyþór R. Þórhallsson MSc, Associate Professor. Guðmundur Gunnarsson MSc.

Learning outcome: On completion of the course students should:

- have an understanding of the principles of earthquake design
- have an understanding of the principles of fire resistant design.
- be able to apply his understanding to the solution of technical problems such as structural design of buildings.

Content: Structural dynamics: Dynamic response of structures, earthquake effects. Total stability of buildings, resistance systems for horizontal actions. The design of reinforcement to resist

Content: Design criteria for air conditioning and ventilation systems. Design and selection of equipment incl. blowers, filters, valves and control systems. Various heating systems, in residential and industrial buildings. The heat pump.

Reading material: Teachers compendium.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: 3 hours written exam counts 70% and projects 30%.

Language of instruction: Icelandic.

BT LAG3003 Water Supply and Wastewater Disposal 3 credits [ECTS:6]

Year of study: Third year.

Semester: Spring.

Level of course: First cycle - Advanced.

Type of course: Elective.

Prerequisites: BT LAG 1003.

Schedule: 4 lectures and 2 practical lessons per week for 12 weeks.

Lecturer: Guðmundur Hjálmarsson BSc, Assistant Professor.

Learning outcome: On completion of the course students should:

- have developed an understanding of the basic principles of water supply and sewage systems and can apply these to solving technical problems.
- be able to prepare complete designs for the most common types of water supply and sewage systems.
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Content: Municipal systems for tap water, wastewater disposal and district heating. Water purification and storage, The origin and composition of household and industrial wastewater. The design and construction of sewage treatment plants, incl selection of equipment. Pumps and pumping stations, the wastewater as a pollutant, and measures to counter pollution.

Reading material: Material from teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: Oral examination counts 60% and projects 40%.

Language of instruction: Icelandic.

BT VEG2003 Road Construction 3 credits [ECTS:6]

Year of study: Third year.

Semester: Spring.

Level of course: First cycle - Advanced.

Type of course: Core.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Björn Ólafsson MSc.

Learning outcome: On completion of the course students should:

- be able to work on the supervision and surveillance of road construction projects, with emphasis on traffic technology and project planning e.g. work schedules, time schedules and cost estimates.

Content: Traffic analysis and prognosis, capacity of roads. Surfaces, incl. tarmac, macadam, concrete. Appurtenant structures. Planning and estimating road works incl. cost estimates and project scheduling.

Reading material: *Íslenskur vegstaðall*. Material from teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 2 hour written examination counts 40%, project work and an oral examination count 30% and 5 written quizzes count 30% to final grade.

Language of instruction: Icelandic.

BT FRK3003 Construction Management and Hydropower 3 credits [ECTS:6]

Year of study: Third year.

Semester: Spring.

Level of course: First cycle - Advanced.

Type of course: Elective.

Prerequisites: AT VST 1003, BT REN 1003, BT JTÆ 1003, BT JTÆ 2013

Schedule: 4 lectures and 2 practical lessons per week for 12 weeks.

Lecturer: Ingunn Sæmundsdóttir Dipl.Ing, Associate Professor. Jón Viðar Guðjónsson BSc. Part-time lecturers.

Learning outcome: On completion of the course students should:

- have an insight into the main aspects of construction management.
- understand the basic principles of water power plants and be able to apply these to solving technical problems.
- be able to be in charge of building work and take care of supervision and inspection on site.

Content: Construction management: Tendering, tender documents, sureties and contracts.

Quality control in construction. Inspection and supervision. Repairs and renovation of buildings and services. Systematic search and evaluation of defects. Guidelines and responsibility. Cost and profit estimates in production and services.

Hydropower plants: Water power and geothermal power. Hydro-electric power plants, theory and practice. Drilling and blasting. Feasibility, design, operation and maintenance.

Reading material: Material from teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: Project work counts 70% and an oral examination counts 30%.

Language of instruction: Icelandic.

VT AÐG2003 Operations Research and Simulation 3 credits [ECTS:6]

Year of study: Third year.

Semester: Spring.

Level of course: First cycle - Intermediate.

Type of course: Elective.

Prerequisites: None.

Schedule: 4 lectures and 3 practical lessons per week for 12 weeks.

Lecturer: Sigurður Óli Gestsson CSc.

Learning outcome: On completion of the course students should:

- have developed knowledge and skills in the application of the methodology of optimisation and simulation.
- be able to design simulation models.
- have obtained skills in forecasting and the use of forecasting software.
- be able to evaluate the quality of forecasts.

Content: Systems, models and analysis. Simulation models and methodology. Time tracking methods. Event models. Discrete simulation, queueing systems, random variable hending. Forecasts and forecast methods and the use of regression analysis in forecast modelling. Forecast evaluation and error estimation.

Reading material: Hillier og Lieberman, *Introduction to Operations Research*. Nhamias, *Production and Operation Analysis*. Hauge and Paige, *Learn Simul8, the complete guide. Simulation Modeling &Analyses*.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: A 2 hour written examination counts 50% and project and oral defense counts 50% in final grade.

Language of instruction: Icelandic.

AT AÐF1003 Research Methods in Engineering 3 credits [ECTS:6]

Year of study: Fourth year.

Semester: Fall.

Level of course: Second cycle - Introductory.

Type of course: Core.

Prerequisites: The first 6 semesters (90 credits = 180 ECTS) of an engineering programme.

Schedule: 4 lectures and 2 practical lessons per week for 12 weeks.

Lecturer: Haraldur Auðunsson PhD, Associate Professor. Ingunn Sæmundsdóttir, Associate Professor.

Learning outcome: On completion of the course students should:

- be able to organize a research project, exploit the data aquired and write a thesis, an article and a presentation to account for the results of the project.

Content: Planning research work, aims and goals. The search for and use of literature and information. Writing a thesis. Codes of ethics. The use of statistics in research work.

Reading material: From teacher.

Teaching and learning activities: Lectures and practical sessions.

Assessment methods: Project grade and exercises count 100%.

Language of instruction: Icelandic.

BT LOK1012 Final Project 12 credits [ECTS:24]

Year of study: Fourth year.

Semester: Fall.

Level of course: Second cycle - Introductory.

Type of course: Core.

Prerequisites: 180 ECTS in Civil Engineering (BT1 - BT6).

Schedule: Independent work by students for 15 weeks in consultation with a mentor.

Lecturer: Ingunn Sæmundsdóttir Dipl.Ing, Associate Professor. Various mentors from the building and construction industry.

Learning outcome: On completion of the course students should:

- have learned to use independent and goal oriented methods in practical project work and/or research work in the building and construction industry.
- have obtained a broad overview through the interaction of courses where he applies knowledge from many subjects previously studied in the Civil Engineering programme.

Content: A design and/or research project selected by the student and approved by the department. The student is required to show his capability to work independently. Projects are drawn from the civil engineering aspects of the Icelandic construction industry, in cooperation with firms and companies in the industry. The main emphasis is on an organized technical approach to the problem and it's definition, gathering of information, synthesis, analysis and optimisation, evaluation and presentation. The student is allotted 15 weeks to complete the project. The project is presented orally and assessed by faculty members and an external assessor.

Reading material: From instructors.

Teaching and learning activities: Meetings with mentors and other instructors.

Assessment methods: Assessment of project thesis, presentation and oral examination count 100%.

Language of instruction: Icelandic.