Hämeen Ammattikorkeakoulu

Degree Programme in Construction Engineering

Employment after graduation

Demand for international construction experts is increasing continuously in international construction projects in Finland and abroad. In addition to houses, construction engineering is applicable in our built-up environment to traffic corridors and water and waste management, for example. The tasks of engineering graduates may be related to the construction of new premises and to the repair of existing structures in engineering, development or project management in Finland and abroad. Daily tasks may involve design, product development, supervision in an official capacity, or trading.

Study paths

The English language Construction Engineering degree programme allows students to focus on structural engineering or environmental technology. At HAMK, structural engineering focuses on steel construction. Students can choose to study part of their degree in Finnish in HAMK’s Finnish language structural engineering programme.

Competence achieved

Construction professionals constantly monitor developments in the sector, they are familiar with the latest design and production techniques and can manage modern management techniques, and they are capable of applying them to practical situations at work. Construction engineers must have a view of the entire construction process in addition to their specialty. Work requires, in addition to professional knowledge management, problem-solving abilities, financial thinking, management skills, cooperation skills, IT skills and language skills. A degree completed in English provides construction engineers with good language skills and international know-how, making it possible to work anywhere in the world.

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<td>4</td>
</tr>
<tr>
<td>CO00BJ83</td>
<td>Matrix Calculus</td>
<td>1</td>
</tr>
<tr>
<td>CO00BJ84</td>
<td>Reporting in English</td>
<td>3</td>
</tr>
<tr>
<td>RA00BC20</td>
<td>Svenska för byggingenjörer</td>
<td>3</td>
</tr>
</tbody>
</table>

**BECO16A-1076 Waste Water**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO00BJ95</td>
<td>Legislation Related to Waste Water Treatment</td>
<td>2</td>
</tr>
<tr>
<td>CO00BJ86</td>
<td>Unit Processes of Sewerage System</td>
<td>3</td>
</tr>
<tr>
<td>CO00BJ87</td>
<td>Waste Water Treatment</td>
<td>3</td>
</tr>
<tr>
<td>CO00BJ96</td>
<td>Fresh Water Limnology</td>
<td>1</td>
</tr>
<tr>
<td>CO00BJ97</td>
<td>Ecological Sanitation, Recycling of Nutrients</td>
<td>3</td>
</tr>
<tr>
<td>CO00BJ84</td>
<td>Reporting in English</td>
<td>3</td>
</tr>
<tr>
<td>RA00BC20</td>
<td>Svenska för byggingenjörer</td>
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</table>

**BECO16A-1075 Steel Structures 2**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO00BK02</td>
<td>Structural Steel Design 1</td>
<td>5</td>
</tr>
<tr>
<td>CO00BM29</td>
<td>Structural Steel Design 2</td>
<td>4</td>
</tr>
<tr>
<td>CO00BK03</td>
<td>Manufacturing and Executing Steel Structures</td>
<td>5</td>
</tr>
<tr>
<td>CO00BK04</td>
<td>BIM in Design of Steel Structures 2</td>
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**BECO16A-1070 Monitoring**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CO00BI81</td>
<td>Soil Investigations and Sample Taking</td>
<td>3</td>
</tr>
<tr>
<td>CO00BM49</td>
<td>Environmental Chemistry and Microbiology</td>
<td>6</td>
</tr>
<tr>
<td>CO00BI83</td>
<td>Remediation Methods of Contaminated Sites</td>
<td>3</td>
</tr>
<tr>
<td>CO00BJ08</td>
<td>Planning and Permit Processes of Remediation Projects</td>
<td>3</td>
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</table>

**BECO16A-1077 Timber Structures**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO00BJ99</td>
<td>Design of Timber Structures</td>
<td>6</td>
</tr>
<tr>
<td>CO00BK00</td>
<td>BIM in Design of Timber Structures</td>
<td>3</td>
</tr>
<tr>
<td>CO00BK01</td>
<td>Mechanics</td>
<td>6</td>
</tr>
<tr>
<td>RA00BF71</td>
<td>Projektin viestintä ja asiakaspalvelu</td>
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**BECO16A-1078 Remediation**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO00BI84</td>
<td>Phases and Participants of a Typical Remediation Project</td>
<td>2</td>
</tr>
<tr>
<td>CO00BJ09</td>
<td>Legislation about Remediation</td>
<td>2</td>
</tr>
<tr>
<td>CO00BJ10</td>
<td>Environmental Geology</td>
<td>5</td>
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</tbody>
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BECO16A-1079 Professional Skills

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CO00BJ11</td>
<td>Remediation Technologies Concerning Soil, Groundwater, Lakes and Rivers</td>
<td>6</td>
</tr>
<tr>
<td>RA00BF71</td>
<td>Projektin viestintä ja asiakaspalvelu</td>
<td>2</td>
</tr>
</tbody>
</table>

**BECO16A-1084 Final Thesis**

**BECO16A-1057 Ydinosaaminen: 45 op**

**BECO16A-1082 Orientation to Engineering Studies: 0 op**

**Osaamistavoitteet**

Student masters his or her own studies and behaviour as an individual and as a member of a group.

- Masters the way of studying at HAMK
- Has an overview of the multinational construction sector and knows its employment opportunities
- Is competent in the essential basic structures and vocabulary in Finnish
- Is able to communicate and is goal-oriented as a student and as a member of a work community, both one-to-one and in a network
- Is able to apply basic mathematical tools in construction engineering problem-solving

**CO0101 Studying at HAMK: 2 op**

**Osaamistavoitteet**

Orientation to Engineering Studies, 15 cr

- Masters the way of studying at HAMK
- Student masters his or her own studies and behaviour as an individual and as a member of a group.
- Has an overview of the multinational construction sector and knows its employment opportunities
- Is competent in the essential basic structures and vocabulary in Finnish
- Is able to communicate and is goal-oriented as a student and as a member of a work community, both one-to-one and in a network
- Is able to apply basic mathematical tools in construction engineering problem-solving

**CO0102 Occupational Safety: 3 op**

**Sisältö**

This is part of module Orientation to Engineering Studies

**CO0201 Architecture and Construction: 1 op**
Osaamistavoitteet
Basics of Construction, 15 op

CO0202 Building Materials: 2 op

Sisältö
This is part of module Basis of Construction

CO0108 Algebra: 3 op

Sisältö
This is part of module Orientation to Engineering Studies

CO00BJ78 English for Engineers 1: 2 op

CO00BJ71 Finnish 1: 2 op

BECO16A-1083 Basics of Construction: 0 op

Osaamistavoitteet
Student has an overview of the basic concepts and courses of action in the construction sector.

• Understands the basic concepts and can read the basic documents of the construction sector
• Can search for information from the established repository and building models (BIM)
• Understands the key physical phenomena concerning constructions
• Is able to communicate orally in basic daily situations in Finnish

CO0204 Basics of Physics: 3 op

Osaamistavoitteet
Basics of Construction, 15 op

Student has an overview of the basic concepts and courses of action in the construction sector.

• Understands the basic concepts and can read the basic documents of the construction sector
• Can search for information from the established repository and building models (BIM)
• Understands the key physical phenomena concerning constructions
• Is able to communicate orally in basic daily situations in Finnish

Sisältö
This is part of module Basis of Construction

CO0103 Project as an Introduction to Construction Engineering: 3 op

Sisältö
This is part of module Orientation to Engineering Studies
CO0203 CAD and BIM: 6 op

**Sisältö**
This is part of module Basis of Construction

CO00BJ79 English for Engineers 2: 1 op

CO00BJ72 Finnish 2: 2 op

RA0206 Tekninen viestintä: 2 op

**Sisältö**
Tämä teema on osa Rakentamisen perusteet-moduulia (vuodesta 2015 alkaen)

BECO16A-1060 House Building: 0 op

**Osaamistavoitteet**
Student knows the structures and materials used in house buildings and can give reasons for choosing them.

- Is able to apply professional knowledge of construction to structures and building services of small buildings
- Can figure out the course of the small building project and knows the stages of the project
- Can utilize a prepared building model and draw up CAD-documents
- Knows the manufacturing and use of concrete
- Is able to communicate in English in situations related to studies and working life
- Is able to use Finnish language in simple written communication

CO0301 Structures and Basics in Mechanics: 2 op

**Osaamistavoitteet**
House Building, 15 cr

Student knows the structures and materials used in house buildings and can give reasons for choosing them.

- Is able to apply professional knowledge of construction to structures and building services of small buildings
- Can figure out the course of the small building project and knows the stages of the project
- Can utilize a prepared building model and draw up CAD-documents
- Knows the manufacturing and use of concrete
- Is able to communicate in English in situations related to studies and working life
- Is able to use Finnish language in simple written communication

**Sisältö**
This is part of module House Building
CO0302 Building Services and Energy Efficiency in Houses: 2 op

Sisältö
This is part of module House Building

CO0303 Completion of a House Project: 2 op

Sisältö
This is part of module House Building

CO00BJ77 Concrete Material Technology and BIM: 4 op

CO0306 Basics in Building Chemistry: 2 op

Sisältö
This is part of module House Building

CO00BJ80 English for Construction Engineers 1: 2 op

CO00BJ73 Finnish 3: 1 op

BECO16A-1061 Basics of Civil Engineering: 0 op

Osaamistavoitteet
Student knows the principles of modern civil engineering.

- Knows ground surveying methods and soil classification
- Knows maps, land-use planning and is able to apply different plans
- Understands environmental impacts of construction
- Able to apply plane and space geometry in his or her calculations
- Communicates both orally and in writing in different interactive situations in English
- Able to operate in Finnish society, particularly in situations related to his or her studies

CO0401 Geotechnics: 3 op

Osaamistavoitteet
Basics of Civil Engineering, 15 cr

- Knows ground surveying methods and soil classification
- Knows maps, land-use planning and is able to apply different plans
- Understands environmental impacts of construction
- Able to apply plane and space geometry in his or her calculations
- Communicates both orally and in writing in different interactive situations in English
- Able to operate in Finnish society, particularly in situations related to his or her studies

Sisältö
This is part of module Basics of Civil Engineering

**CO0402 Basics of Civil Engineering: 2 op**

Sisältö
This is part of module Basics of Civil Engineering

**CO0403 Basics of Environmental Engineering: 2 op**

Sisältö
This is part of module Basics of Civil Engineering

**CO0404 Maps and Calculations: 2 op**

**CO0405 Geometry and Linear Algebra: 3 op**

**CO00BJ81 English for Construction Engineers 2: 1 op**

**CO00BJ74 Finnish 4: 2 op**

**RA0905 Kokousviestintä: 2 op**

Sisältö
Tämä teema on osa Betonirakenteiden suunnittelumoduulia

**BECO16A-1062 Basics of Structural Design: 15 op**

**Osaamistavoitteet**
Student is able to design simple structures.

• Masters the basics of mechanics and strength of materials
• Able to design simple load-bearing structures of a house
• Able to apply differential and integral calculus in construction engineering

**CO0501 Mechanics and Strength of Materials: 3 op**

**Osaamistavoitteet**
Basics of Structural Design, 15 cr

Student is
- Able to design simple structures.
- Masters the basics of mechanics and strength of materials
- Able to design simple load-bearing structures of a house
- Able to apply differential and integral calculus in construction engineering
CO0502 Basis of Structural Design: 3 op

CO0503 Design of Timber and Reinforced Concrete Structures: 6 op

CO0504 Differential and Integral Calculus: 3 op

BECO16A-1071 Work placement: 30 op

CO00BK13 Work Placement 1: 10 op

CO00BK14 Work Placement 2: 10 op

CO00BK15 Work Placement 3: 10 op

BECO16A-1072 Profiloiva osaaminen: 101 op

BECO16A-1063 Residential Buildings: 0 op

Osaamistavoitteet
Student masters issues of multi-level residential buildings.

• Knows the structures, foundations and structural frames, building services and materials of multi-level residential buildings
• Knows building machinery
• Able to use computer programs in design
• Knows the operations and practices in concrete works
• Able to define cost estimation in different stages of the project
• Has a solid understanding of the structures in Finnish and is familiar with the culture of Finnish working life

CO0601 Structures of Residential Buildings: 2 op

Osaamistavoitteet
Residential Buildings, 15 cr

Student masters issues of multi-level residential buildings.

• Knows the structures, foundations and structural frames, building services and materials of multi-level residential buildings
• Knows building machinery
• Able to use computer programs in design
• Knows the operations and practices in concrete works
• Able to define cost estimation in different stages of the project
• Has a solid understanding of the structures in Finnish and is familiar with the culture of Finnish working life
CO0602 Concrete Works: 2 op
Sisältö
This is part of the module Residential Buildings

CO0603 BIM: 2 op
Sisältö
This is part of the module Residential Buildings

CO0604 Management and Cost Estimation: 3 op
Sisältö
This is part of the module Residential Buildings

CO0605 Foundation Engineering: 3 op
Sisältö
This is part of the module Residential Buildings

CO00BJ76 Finnish 5: 3 op

BECO16A-1064 Worldwide Environmental Engineering: 0 op

Osaamistavoitteet
Student masters the main issues of global environmental technology.

• Knows the most serious phenomena affecting our common environment
• Knows the most important health effects of the environment and the methods of assessing them
• Knows the basics of microbiology and environmental chemistry
• Has a solid understanding of the structures in Finnish and is familiar with the culture of Finnish working life

CO0701 Global Environmental Problems: 4 op

Osaamistavoitteet
Worldwide Environmental Engineering, 15 cr

Student masters the main issues of global environmental technology.

• Knows the most serious phenomena affecting our common environment
• Knows the most important health effects of the environment and the methods of assessing them
• Knows the basics of microbiology and environmental chemistry
• Has a solid understanding of the structures in Finnish and is familiar with the culture of Finnish working life
This is part of the module Worldwide Environmental Engineering

**CO0702 Environmental Health Care: 3 op**

This is part of the module Worldwide Environmental Engineering

**CO00BI96 Climate Politics: 5 op**

**CO00BJ76 Finnish 5: 3 op**

**BECO16A-1065 Commercial Buildings: 15 op**

**Osaamistavoitteet**
Student masters issues of commercial and industrial buildings.

- Knows the structures, foundations and structural frames and materials in commercial and industrial buildings
- Knows the building services and facts of energy efficiency
- Knows the material properties of structural steel
- Knows basics of manufacturing and executing steel structures
- Is able to use computer programs in design
- Is able to apply mathematical methods and programs in solving problems concerning construction engineering

**CO0801 Structures in Commercial Buildings: 2 op**

**Osaamistavoitteet**
Commercial Buildings, 15 cr

Student
- Knows the structures, foundations and structural frames and materials in commercial and industrial buildings
- Knows the building services and facts of energy efficiency
- Knows the material properties of structural steel
- Knows basics of manufacturing and executing steel structures
- Is able to use computer programs in design
- Is able to apply mathematical methods and programs in solving problems concerning construction engineering

This is part of the module Commercial Buildings

**CO0802 Building Services and Energy Efficiency: 2 op**

This is part of the module Commercial Buildings
This is part of the module Commercial Buildings

CO0803 Material Properties of Steel and Steel Products: 2 op

Sisältö
This is part of the module Commercial Buildings

CO0804 Basics of Manufacturing and Executing Steel Constructions: 2 op

Sisältö
This is part of the module Commercial Buildings

CO00BJ75 Task Management in Commercial Buildings: 2 op

CO0806 Heat, Moisture, Sound and Fire Regulations: 2 op

Sisältö
This is part of the module Commercial Buildings

CO00BJ82 Differential Equations, Functions of Several Variables, Propability Calculus and Basic Statistical Methods: 3 op

BECO16A-1066 Energy in Construction Technology: 15 op

Osaamistavoitteet
Student realises energy and efficiency as a part of construction technology.

• Knows regulations in the energy sector related to construction and buildings
• Has the knowledge about energy resources and the importance of renewable energies
• Able to implement an energy audit in existing buildings and make a report
• Knows the best practices of energy saving in buildings and production
• Able to apply mathematical methods and programs in solving problems concerning construction engineering

CO0901 Renewable Energy: 4 op

Osaamistavoitteet
Energy in Construction Technology, 15 cr

Student realises energy and efficiency as a part of construction technology.

• Knows regulations in the energy sector related to construction and buildings
• Has the knowledge about energy resources and the importance of renewable energies
• Able to implement an energy audit in existing buildings and make a report
• Knows the best practices of energy saving in buildings and production
• Able to apply mathematical methods and programs in solving problems concerning construction engineering
This is part of the module Energy in Construction Technology

**CO0902 Energy Economics and Consumption: 3 op**

This is part of the module Energy in Construction Technology

**CO0903 Energy Audit in Practice: 2 op**

This is part of the module Energy in Construction Technology

**CO0904 Zero Energy Buildings: 3 op**

This is part of the module Energy in Construction Technology

**CO00BJ82 Differential Equations, Functions of Several Variables, Probability Calculus and Basic Statistical Methods: 3 op**

**BECO16A-1067 Reinforced Concrete Structures: 0 op**

**Osaamistavoitteet**

Student is able to design reinforced concrete structures of qualification level A.

- Knows the principles of reinforced concrete structures and is able to design the common structures of qualification level A
- Knows the basics of prefabricated concrete constructions
- Understands the elastic and plastic behaviour of structures
- Able to run a meeting and create necessary documentation

**CO1001 Design of Reinforced Concrete Structures: 3 op**

**Osaamistavoitteet**

Student is able to design reinforced concrete structures of qualification level A.

- Knows the principles of reinforced concrete structures and is able to design the common structures of qualification level A
- Knows the basics of prefabricated concrete constructions
- Understands the elastic and plastic behaviour of structures
- Able to run a meeting and create necessary documentation
Sisältö
This is part of the module Reinforced Concrete Structures

**CO1002 Prefabricated Concrete Structures: 3 op**

Sisältö
This is part of the module Reinforced Concrete Structures

**CO1003 BIM in Design of Concrete Structures: 3 op**

Sisältö
This is part of the module Reinforced Concrete Structures

**CO1004 Mechanics: 3 op**

Sisältö
This is part of the module Reinforced Concrete Structures

**CO00BK19 Meeting Practices and Negotiation Situations: 3 op**

**RA00BF53 Ruotsin kielen perusteet: 2 op**

**BECO16A-1068 Waste Management: 0 op**

**Osaamistavoitteet**

Student knows the typical integrated waste management system of municipal solid waste and the main treatment methods for waste.

- Capable to participate in waste management planning processes
- Knows the role of different waste treatment methods in the whole waste management system
- Understands the role of national and European Union requirements in waste management
- Knows the role of the public and private sectors in waste management
- Able to conduct a meeting and create the necessary documentation

**CO1101 Integrated Waste Management System: 4 op**

**Osaamistavoitteet**

Waste Management, 15 cr

Student knows the typical integrated waste management system of municipal solid waste and the main treatment methods for waste.

- Capable to participate in waste management planning processes
- Knows the role of different waste treatment methods in the whole waste management system
- Understands the role of national and European Union requirements in waste management
- Knows the role of the public and private sectors in waste management
• Able to conduct a meeting and create the necessary documentation

Sisältö
This is part of the module Waste Management

CO1102 Treatment Processes of Municipal Solid Waste: 4 op

Sisältö
This is part of the module Waste Management

CO1103 Reduce, Reuse and Recycle Wastes: 2 op

Sisältö
This is part of the module Waste Management

CO1104 Waste Management Businesses: 2 op

Sisältö
This is part of the module Waste Management

CO00BK19 Meeting Practices and Negotiation Situations: 3 op

RA00BF53 Ruotsin kielen perusteet: 2 op

BECO16A-1069 Renovation: 15 op

Osaamistavoitteet
Student understands the important concepts of building physics and their influence in energy efficiency and health. Student knows the damaging mechanisms of structures and can choose the appropriate renovation method.

• Knows the structures in different eras and their common damages and means of renovation
• Understands the important concepts of building physics and their significance to high-quality and healthy construction
• Able to design improvements in energy efficiency
• Has an understanding of the essential Finnish vocabulary of the field of study and employment
• Kommunicerar muntligt och skriftligen i växelverkan situationen i svenska språket

CO00BK08 Building Physics related to Renovation: 3 op

Osaamistavoitteet
Renovation, 15 cr

Student understands the important concepts of building physics and their influence in energy efficiency and health. Student knows the damaging mechanisms of structures and can choose the appropriate renovation method.
• Knows the structures in different eras and their common damages and means of renovation
• Understands the important concepts of building physics and their significance to high-quality and healthy construction
• Able to design improvements in energy efficiency

**CO00BK09** Structures and their Damages: 3 op

**CO00BK10** BIM in Renovation Design: 3 op

**CO00BK11** Healthy Indoor Air: 4 op

**CO00BK12** Improvements in Energy Efficiency: 2 op

**BECO16A-1074** Water Supply: 15 op

**Osaamistavoitteet**
Student knows the drinking water standards, how drinking water is produced and distributed to customers.

• Understands the role of national and European Union standards in drinking water quality
• Capable of participating in typical water treatment planning processes
• Knows the unit processes of water treatment
• Knows the role of the public and private sectors in water management
• Able to apply probability calculus, basic statistical methods in solving problems concerning construction engineering

**CO00BJ85** Unit Processes of Water Treatment: 4 op

**Osaamistavoitteet**
Water Supply, 15 cr

Student knows the drinking water standards, how drinking water is produced and distributed to customers.

• Understands the role of national and European Union standards in drinking water quality
• Capable of participating in typical water treatment planning processes
• Knows the unit processes of water treatment
• Knows the role of the public and private sectors in water management
• Able to apply probability calculus, basic statistical methods in solving problems concerning construction engineering

**CO00BJ88** Hydrology and Raw Water Resources: 4 op

**CO00BJ89** Structure of a Water Management System: 2 op
Planning Processes and Calculations in Water Management: 3 op
Legislation Related to Water Supply: 2 op
BECO16A-1073 Steel Structures 1: 0 op

Osaamistavoitteet
Student is able to design steel structures.
• Able to design basic components of steel structures
• Able to apply the finite element method in construction mechanics
• Able to apply matrix calculus in solving problems concerning construction engineering
• Able to report and negotiate in English

RA00BF60 Design of Steel Structures: 3 op

Osaamistavoitteet
Steel Structures 1, 15 cr
Student is able to design steel structures.
• Able to design basic components of steel structures
• Able to apply the finite element method in construction mechanics
• Able to apply matrix calculus in solving problems concerning construction engineering

RA00BM25 Fundamentals in Finite Element Analysis: 3 op

RA00BF61 BIM in Design of Steel Structures: 2 op

RA00BF62 Mechanics 2: 3 op

CO00BJ83 Matrix Calculus: 1 op

CO00BJ84 Reporting in English: 3 op

RA00BC20 Svenska för byggingenjörer: 3 op

BECO16A-1076 Waste Water: 0 op

Osaamistavoitteet
Student knows the waste water standards, how waste water is collected from customers and treated.
• Understands the role of waste water management
• Knows the unit processes of waste water treatment
• Knows the impacts of waste water in ecosystems
• Able to report and negotiate in English
CO00BJ95 Legislation Related to Waste Water Treatment: 2 op

Osaamistavoitteet
Waste Water, 15 cr

Student knows the waste water standards, how waste water is collected from customers and treated.
• Understands the role of waste water management
• Knows the unit processes of waste water treatment
• Knows the impacts of waste water in ecosystems
• Able to report and negotiate in English

CO00BJ86 Unit Processes of Sewerage System: 3 op

CO00BJ87 Waste Water Treatment: 3 op

CO00BJ96 Fresh Water Limnology: 1 op

CO00BJ97 Ecological Sanitation, Recycling of Nutrients: 3 op

CO00BJ84 Reporting in English: 3 op

RA00BC20 Svenska för byggingenjörer: 3 op

BECO16A-1075 Steel Structures 2: 15 op

Osaamistavoitteet
Student is able to design typical steel frames and envelopes (qualification level A). In addition, he or she knows special issues related to sheet metal, fire design and has deeper knowledge on manufacturing and executing steel constructions.

• Able to analyse and design typical steel frames considering stability of the frame
• Able to design typical joints in steel frames
• Able to design typical sheet metal structures
• Knows the basics of fire design

CO00BK02 Structural Steel Design 1: 5 op

Osaamistavoitteet
Steel Structures 2, 15 cr

Student is able to design typical steel frames and envelopes (qualification level A). In addition, he or she knows special issues related to sheet metal, fire design and has deeper knowledge on manufacturing and executing steel constructions.

• Able to analyse and design typical steel frames considering stability of the frame
• Able to design typical joints in steel frames
• Able to design typical sheet metal structures
• Knows the basics of fire design

**CO00BM29 Structural Steel Design 2: 4 op**

**CO00BK03 Manufacturing and Executing Steel Structures: 3 op**

**CO00BK04 BIM in Design of Steel Structures 2: 3 op**

**BECO16A-1070 Monitoring: 15 op**

**Osaamistavoitteet**
Student is able to use the most common methods of field and laboratory analytic.

• Knows main measuring principles of common substances
• Able to take samples and analyse them as a member of a group
• Able to interpret and utilize the results in practice

**CO00BI81 Soil Investigations and Sample Taking: 3 op**

**Osaamistavoitteet**
Monitoring, 15 cr

Student is able to use the most common methods of field and laboratory analytic.

• Knows main measuring principles of common substances
• Able to take samples and analyse them as a member of a group
• Able to interpret and utilize the results in practice

**CO00BM49 Environmental Chemistry and Microbiology: 6 op**

**CO00BI83 Remediation Methods of Contaminated Sites: 3 op**

**CO00BJ08 Planning and Permit Processes of Remediation Projects: 3 op**

**BECO16A-1077 Timber Structures: 0 op**

**Osaamistavoitteet**
Student is able to design timber structures in qualification level A.

• Knows the material properties of timber and timber products and is able to design the common structures in qualification level A
• Understands the meaning of stability and vibration
CO00BJ99 Design of Timber Structures: 6 op

Osaamistavoitteet
Timber Structures, 15 cr

Student is able to design timber structures in qualification level A.

•Knows the material properties of timber and timber products and is able to design the common structures in qualification level A
•Understands the meaning of stability and vibration

CO00BK00 BIM in Design of Timber Structures: 3 op

CO00BK01 Mechanics: 6 op

RA00BF71 Projektin viestintä ja asiakaspalvelu: 2 op

BECO16A-1078 Remediation: 0 op

Osaamistavoitteet
Student understands the process of environmental remediation.

•Capable of participating in the remediation planning process and to supervising different remediation projects
•Has the knowledge and understanding of different methods of remediation
•Able to use all associated documents for remediation processes

CO00BI84 Phases and Participants of a Typical Remediation Project: 2 op

Osaamistavoitteet
Remediation, 15 cr

Student understands the process of environmental remediation.

•Capable of participating in the remediation planning process and to supervising different remediation projects
•Has the knowledge and understanding of different methods of remediation
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CO00BJ09 Legislation about Remediation: 2 op

CO00BJ10 Environmental Geology: 5 op

CO00BJ11 Remediation Technologies Concerning Soil, Groundwater, Lakes and Rivers: 6 op
RA00BF71 Projektin viestintä ja asiakaspalvelu: 2 op

BECO16A-1079 Professional Skills: 11 op

CO00BK05 Finnish 6: 2 op

CO00BK07 Finnish 7: 3 op

TU00BL76 Yrityksen toiminnan perusteet: 3 op

Osaamistavoitteet
Yrityksen liiketoiminta koostuu yrittäjätiimistä, tuotteista ja palveluista, markkinoista ja asiakkaista, voimavaroista, toimintaympäristöstä ja niiden yhteen sovittaminen tapahtuu erilaisissa liiketoiminnan suunnittelun, toteutuksen, arvioinnin ja kehittämisen prosessissa. Liiketoiminnan kehittäminen on analyyttistä valmistautumista yrityksen liiketoiminnan käynnistämiseen ja kasvattamiseen.

Opiskelija osaa
• tunnistaa yrityksen toiminnot ja liiketoiminnan toimintaympäristön markkinoiden, toimialan, trendien ja makrotalouden osalta
• osaa analysoida yrityksen liiketoimintaympäristön vaikutukset liiketoimintaan
• suunnitella ja arvioida kannattavan yrityksen liiketoimintaa ja sen edellytyksiä
• valita asianakuuluvan yhtiömuodon
• osaa perustaa omalle toimialalleen yrityksen liiketoiminnan

TU00BL75 Yrittäjyys - asennetta ja tekemistä: 3 op

Osaamistavoitteet

Opiskelija osaa
• etsiä, tunnistaa ja arvioida liiketoimintamahdollisuuksia
• luoda liikeideoita ja arvioida niiden kiinnostavuutta
• toimia yritteliäästi
• arvioida liikeidean taloudellisia ulottuvuuksia
• esittää ja myydä idean eri kohderyhmiille

BECO16A-1084 Final Thesis: 15 op

BE00BJ90 Final Thesis: 15 op