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<td>Integrated Waste Management System</td>
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<td>Treatment Processes of Municipal Solid Waste</td>
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<td>CO1103</td>
<td>Reduce, Reuse and Recycle Wastes</td>
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<td>Waste Management Businesses</td>
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<td>Meeting Practices and Negotiation Situations</td>
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**BECON15AYDIN-1000** Ydinosaaminen: 110 op

**BECON15AC001-1000** Orientation to Engineering Studies: 15 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

CO0103 Project as an Introduction to Construction Engineering: 3 op

Sisältö
This is part of module Orientation to Engineering Studies

CO0108 Algebra: 3 op

Sisältö
This is part of module Orientation to Engineering Studies

CO0105 Finnish: 1 op

Sisältö
This is part of module Orientation to Engineering Studies

CO0106 Viestintä: 1 op
CO0107 English for Engineers: 2 op

Sisältö
This is part of module Orientation to Engineering Studies

BECON15ACO02-1000 Basis of Construction: 17 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

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

CO0203 CAD and BIM: 6 op

Sisältö
This is part of module Basis of Construction

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

**CO0205 English for Engineers: 1 op**

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

**CO0206 Finnish: 2 op**

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

**CO0207 Viestintä: 2 op**

**Sisältö**
Tämä teema on osa Basics of Construction-moduulia

**BECON15ACO03-1000 House Building: 16 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
CO0302 Building Services and Energy Efficiency in Houses: 2 op

CO0303 Completion of a House Project: 2 op

CO0304 Concrete Material Technology: 3 op

CO0305 CAD and BIM: 1 op

CO0306 Basics in Building Chemistry: 2 op

CO0307 English for Engineers: 2 op

CO0308 Finnish: 1 op

CO0309 Viestintä: 1 op
BECON15ACO04-1000 Basics of Civil Engineering: 17 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

CO0406 English for Engineers: 1 op

Sisältö
This is part of module Basics of Civil Engineering
CO0407 Finnish: 2 op

Sisältö
This is part of module Basics of Civil Engineering

CO0408 Viestintä: 2 op

Sisältö
Tämä teema on osa Basics of Civil Engineering -moduulia

BECON15ACO05-1000 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

BECON15AHAR02-1000 Work placement: 30 op

CO00BL83 Work Placement 1: 10 op

CO00BL84 Work Placement 2: 10 op

CO00BL85 Work Placement 3: 10 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

CO0606 Finnish: 3 op

Sisältö
This is part of the modules Residential Buildings and Worldwide Environmental Engineering

RA00BF53 Ruotsin kielen perusteet: 2 op

RA00BM20 Svenska för byggingenjörer 1: 1 op

BECON15APROFILOIVA-1008 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

CO0606 Finnish: 3 op
Sisältö
This is part of the modules Residential Buildings and Worldwide Environmental Engineering

RA00BF53 Ruotsin kielen perusteet: 2 op

RA00BM20 Svenska för byggingenjörer 1: 1 op

BECON15ACO08-1000 Commercial Buildings: 0 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

Sisältö
This is part of the module Commercial Buildings

CO0802 Building Services and Energy Efficiency: 2 op

Sisältö
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

**CO0805 Management and Cost Estimating of Commercial Buildings: 2 op**

*Sisältö*
This is part of the module Commercial Buildings

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

*Sisältö*
This is part of the module Commercial Buildings

**CO0807 Differential Equations, Functions of Several Variables, Matrix Calculus: 3 op**

*Sisältö*
This is part of the modules Commercial Buildings and Energy in Construction Technology

**RA00BM50 Svenska för byggingenjörer 2: 2 op**

**BECON15APROFILOIVA-1002 Monitoring: 0 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

**RA00BF56 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
RA00BF57 Environmental Chemistry and Microbiology: 4 op

RA00BF58 Remediation Methods of Contaminated Sites: 3 op

RA00BF59 Planning and Permit Processes of Remediation Projects: 3 op

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 kohderyhmille

RA00BM50 Svenska för byggingenjörer 2: 2 op

BECON15ACO10-1000 Reinforced Concrete Structures: 15 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
Reinforced Concrete Structures, 15 cr

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
This is part of the module Reinforced Concrete Structures

**CO1002 Prefabricated Concrete Structures: 3 op**

This is part of the module Reinforced Concrete Structures

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

This is part of the module Reinforced Concrete Structures

**CO1004 Mechanics: 3 op**

This is part of the module Reinforced Concrete Structures

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

**BECON15APROFILOIVA-1004 Remediation: 15 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
• Able to use all associated documents for remediation processes

**CO00BJ09 Legislation about Remediation: 2 op**

**CO00BJ10 Environmental Geology: 5 op**
CO00BJ11 Remediation Technologies Concerning Soil, Groundwater, Lakes and Rivers: 6 op

BECON15APROFILOIVA-1001 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

BECON15APROFILOIVA-1006 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**

**CO00BJ93 Planning Processes and Calculations in Water Management: 3 op**

**CO00BJ94 Legislation Related to Water Supply: 2 op**

**BECON15APROFILOIVA-1003 Steel Structures 1: 15 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
BECON15ACO07-1000 Worldwide Environmental Engineering: 15 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

Sisältö
This is part of the module Worldwide Environmental Engineering

CO0702 Environmental Health Care: 3 op

Sisältö
This is part of the module Worldwide Environmental Engineering
CO00BJ84 Reporting in English: 3 op

CO00BI96 Climate Politics: 5 op

BECON15APROFILOIVA-1010 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

BECON15ACO09-1000 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
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

Sisältö
This is part of the module Energy in Construction Technology

CO0902 Energy Economics and Consumption: 3 op

Sisältö
This is part of the module Energy in Construction Technology

CO0903 Energy Audit in Practice: 2 op

Sisältö
This is part of the module Energy in Construction Technology

CO0904 Zero Energy Buildings: 3 op

Sisältö
This is part of the module Energy in Construction Technology

CO0905 Differential Equations, Functions of Several Variables, Matrix Calculus: 3 op

Sisältö
This is part of the module Energy in Construction Technology

BECON15APROFILOIVA-1007 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**

**BECON15ACO11-1000 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

RA00BF71 Projektin viestintä ja asiakaspalvelu: 2 op

BECON15A99991206-1000 Professional Skills: 0 op

BECON15A7777-1000 Opinnäytetyö: 15 op

BECON15ACO20-1000 Thesis: 15 op

99991203 Final Thesis: 15 op