Häme University of Applied Sciences

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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### Objectives

By completing this module, student:

- 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 of Finnish language
- 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

### Evaluation criteria

- **Satisfactory (1-2)**
  
  Student is able to complete the central assignments in the module under supervision and utilising the given examples.

- **Good (3-4)**
  
  Student is able to complete independently the central assignments utilising the given examples.

- **Excellent (5)**
  
  Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.
CO00BP95 Planning and Completion of a One-Family House Building Project: 15 op

Objectives
Student understands the planning and completion process in a one-family house building project.

Evaluation criteria
Satisfactory (1-2)

Student is able to complete the central assignments in the module under supervision and utilising the given examples.

Good (3-4)

Student is able to complete independently the central assignments in the module utilising the given examples.

Excellent (5)

Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

CO00BP96 Structural Engineering of a One-Family House: 15 op

Evaluation criteria
Satisfactory (1-2)

Student is able to complete the central assignments in the module under supervision and utilising the given examples.

Good (3-4)

Student is able to complete independently the central assignments in the module utilising the given examples.

Excellent (5)

Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

CO00BP97 Basics of Structural Design: 15 op

Objectives
Student is able to design simple structures.

Student:

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

Evaluation criteria
Satisfactory (1-2)
Student is able to complete the central assignments in the module under supervision and utilising the given examples.

**Good (3-4)**

Student is able to complete independently the central assignments in the module utilising the given examples.

**Excellent (5)**

Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

**CO00BP98 Work placement: 30 op**

**Objectives**
The objective of work placement for students is to combine learnt theory to practical work and thus deepen their understanding and competences in Construction Engineering.

**BECO17-1001 Profiling Competence: 210 op**

**CO00BP99 Residential Buildings: 15 op**

**Objectives**
Student:
- Knows the structures, foundations and structural frames, building services and materials of multi-level residential buildings
- Knows building machinery
- Is able to use computer programmes in design
- Knows the operations and practices in concrete works
- Is able to define cost estimation at different stages of the project
- Has a solid understanding of the Finnish language structures and is familiar with the culture of Finnish work life

**Evaluation criteria**
**Satisfactory (1-2)**

Student is able to complete the central assignments in the module under supervision and utilising the given examples.

**Good (3-4)**

Student is able to complete independently the central assignments utilising the given examples.

**Excellent (5)**

Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

**CO00BQ00 Worldwide Environmental Engineering: 15 op**
Objectives
Student masters the main issues of global environmental technology.
Student:

- 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 Finnish language structures and is familiar with the culture of Finnish work life

Evaluation criteria
Satisfactory (1-2)
Student is able to complete the central assignments in the module under supervision and utilising the given examples.

Good (3-4)
Student is able to complete independently the central assignments utilising the given examples.

Excellent (5)
Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

CO00BQ01 Commercial and Municipal Buildings: 15 op

Objectives
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 programmes in design
- Is able to apply mathematical methods and programs in solving problems concerning construction engineering

CO00BQ02 Energy in Construction Technology: 15 op

Objectives
Student sees energy and efficiency as a part of construction technology.
Student:

- Knows the regulations in the energy sector related to construction and buildings
- Has knowledge about energy resources and the importance of renewable energies
- Is able to implement an energy audit in existing buildings and to make a report
- Knows the best practices of energy saving in buildings and production
- Is able to apply mathematical methods and programmes in solving problems concerning construction engineering
Evaluation criteria
Satisfactory (1-2)

Student is able to complete the central assignments in the module under supervision and utilising the given examples.

Good (3-4)

Student is able to complete independently the central assignments utilising the given examples.

Excellent (5)

Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

CO00BQ03 Reinforced Concrete Structures: 15 op

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

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

Evaluation criteria
Satisfactory (1-2)

Student is able to complete the central assignments in the module under supervision and utilising the given examples.

Good (3-4)

Student is able to complete independently the central assignments utilising the given examples.

Excellent (5)

Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

CO00BQ04 Waste Management: 15 op

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

Student:
• Is capable of participating 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
• Is able to run a meeting and create the necessary documentation

**Evaluation criteria**

**Satisfactory (1-2)**

Student is able to complete the central assignments in the module under supervision and utilising the given examples.

**Good (3-4)**

Student is able to complete independently the central assignments utilising the given examples.

**Excellent (5)**

Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

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**CO00BQ05 Renovation: 15 op**

**Objectives**

Student understands the most 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.

Student:

• Knows the structures of 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
• Is able to design improvements in energy efficiency
• Has an understanding of the essential Finnish vocabulary in the field of study and employment

**Evaluation criteria**

**Satisfactory (1-2)**

Student is able to complete the central assignments in the module under supervision and utilising the given examples.

**Good (3-4)**

Student is able to complete independently the central assignments utilising the given examples.

**Excellent (5)**

Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

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**CO00BQ06 Water Supply: 15 op**

**Objectives**

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

Student:
• Understands the role of national and European Union standards in drinking water quality
• Is 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
• Is able to apply probability calculus and basic statistical methods in solving problems concerning construction engineering

**Evaluation criteria**

**Satisfactory (1-2)**

Student is able to complete the central assignments in the module under supervision and utilising the given examples.

**Good (3-4)**

Student is able to complete independently the central assignments utilising the given examples.

**Excellent (5)**

Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

**CO00BQ07 Steel Structures 1: 15 op**

**Objectives**

Student is able to design steel structures.

Student:

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

**Evaluation criteria**

**Satisfactory (1-2)**

Student is able to complete the central assignments in the module under supervision and utilising the given examples.

**Good (3-4)**

Student is able to complete independently the central assignments utilising the given examples.

**Excellent (5)**

Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

**CO00BQ08 Waste Water: 15 op**

**Objectives**

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

CO00BQ09 Steel Structures 2: 15 op

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

• Analyse and design typical steel frames considering stability of the frame
• Design typical joints in steel frames
• Design typical sheet metal structures

Evaluation criteria
Satisfactory (1-2)
Student is able to complete the central assignments in the module under supervision and utilising the given examples.

Good (3-4)
Student is able to complete independently the central assignments utilising the given examples.

Excellent (5)
Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

CO00BQ10 Monitoring: 15 op

Objectives
Student is able to use the most common methods of field and laboratory analytics.
Student:

• Knows the main measuring principles of common substances
• Is able to take samples and analyse them as a member of a group
• Is able to interpret and utilise the results in practice
• Has an understanding of the essential Finnish vocabulary in the field of study and employment

Evaluation criteria
Satisfactory (1-2)
Student is able to complete the central assignments in the module under supervision and utilising the given examples.

Good (3-4)
Student is able to complete independently the central assignments utilising the given examples.

Excellent (5)
Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

**CO00BQ11 Timber Structures: 15 op**

**Objectives**
Student is able to design timber structures according to qualification level A.

Student:
- Knows the material properties of timber and timber products and is able to design the common structures according to qualification level A
- Understands the meaning of stability and vibration
- Gets along in different oral communication situations and is able to write concise texts in Finnish language in a work community

**Evaluation criteria**

**Satisfactory (1-2)**

Student is able to complete the central assignments in the module under supervision and utilising the given examples.

**Good (3-4)**

Student is able to complete independently the central assignments utilising the given examples.

**Excellent (5)**

Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

**CO00BQ12 Remediation: 15 op**

**Objectives**
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
- Gets along in different oral communication situations and is able to write compact texts in a working community in Finnish

**Evaluation criteria**

**Satisfactory (1-2)**

Student is able to complete the central assignments in the module under supervision and utilising the given examples.

**Good (3-4)**

Student is able to complete independently the central assignments utilising the given examples.

**Excellent (5)**
Student is able to complete independently even the most demanding assignments in the module and knows how to apply the acquired knowledge in practice.

**BECO17-1004 Professional Skills: 0 op**

**BECO17-1002 Final Thesis: 15 op**

**99991203 Final Thesis: 15 op**

**Objectives**

**DESCRIPTION**

Thesis is a project in which you utilise your professional key areas. It is an independently produced research, product development or other development project.

**LEARNING OUTCOMES**

The student

- is able to put forward well-grounded, workplace-related development proposals
- is able to find and use source materials critically with respect to the source material’s intellectual property rights
- is able to conceptualize workplace-related phenomena based on research
- is able to use suitable development and research methods for producing new knowledge
- is capable of working together and responsibly with others in the workplace development projects and in other development projects
- is able to assess his/her own actions and decisions critically
- is able to manage entities and present his/her case logically and justifying
- is able to manage appropriate written, visual, and oral expression