CURRICULUM

CIVIL ENGINEERING

The Degree Program in Civil Engineering trains engineers for the construction field. Students are provided with readiness to plan, implement and maintain high-quality and healthy buildings. The focus area in civil engineering is wood construction that is also a strategic development target in the region.

Degree

Degree Title	Bachelor of Engineering
Extent	240 cr / 4 years

Typical Tasks for Graduates

Engineers graduating with the degree in civil engineering are working in planning, management, sales or product development tasks in design offices, construction companies and construction industry. Typical job titles are: structural engineer, site engineer, sales engineer, building surveyor, contracting engineer and renovation planning engineer.

Engineers who have graduated in civil engineering have generally been easily employed because there has been a lack of competent designers and production managers. Increasing wood construction creates new employment opportunities in building, planning and construction industry. Increase in renovation brings about new possibilities for employment in the future. The development and maintenance our most significant national property is at issue. International construction export also provides a challenging work field.

Implementation of Studies

Civil engineering studies provide you with a solid base for structural planning as well as for planning and managing production. Furthermore, your studies entail cooperation with companies and other interest groups in the form of projects and assignments, which help you to build your own professional networks. You also have a possibility to complete part of your studies or work placement abroad and thus prepare to operate in international construction projects. An integral part of your studies is studying and learning in construction laboratory as well as enhancing your learning on building sites and in design offices.

Structure and Content of Studies

Your degree programme contains common core and complementary studies enhancing your key and specialised competences. In the Degree Program in Civil Engineering the extent of common core studies is 215 credits and complementary studies 15 credits. The common core studies contain 30 credits of practical training and 15 credits for the thesis. The thesis process is divided into three 5-credit courses. Each course can be completed at different stages of studies. However, the thesis plan needs to be accepted before the implementation phase.

During the first and the second study years you will study the basics in professional subjects for a construction engineer. The first year includes e.g. building materials, structures in house building and the second year gives the basics for designing related to both structures and building production. The third year with the complementary studies gives the opportunity to specialize either to structural design or building production. The fourth year consists of complementary studies and the thesis.

The complementary studies mostly contain modules of 15 credits. A civil engineer's training gives the qualifications to work as a general supervisor as stated in the Land Use and Building Act. The person's qualification for various tasks is defined according to chosen studies. The following modules suit well as advanced complementary studies:

- Practical Training in Working Life 1
- Practical training in Working Life 2
- Renovation and Condition Survey Methods
- Management and Supervision
- Business Competence and Entrepreneurship
- International Studies 1
- Optional Language (Spanish, Chinese, French, German, Russian)
- Refresher Courses in Languages and Mathematics (3-12credits)
- Training Program of Joensuu Sports Academy (3–15 credits)
- Participation in Peer Tutoring and Student Union Activities (3–15 credits)

Complementary studies have been scheduled to take place in the autumn semester of the fourth year. Additionally, complementary studies can be taken during summer months. Participation in Sports Academy training, peer tutoring or student union activities as well as optional language studies can be spread over several semesters. If the studies mentioned above do not match with your professional objectives, you can discuss other alternatives with your teacher tutor or study counsellor.

CIVIL ENGINEERING

Bachelor of Engineering | 240 cr / 4 years

Karelia

Structure Design Competence | Building Production Competence | Wood Construction Competence | Renovation Competence | Leadership Competence | Environmental Responsibility and Life Cycle Competence | Ethical Competence | Internationalisation Competence | Learning Skills | Innovation Competence | Work Community Competence

*The text in italics concerns **production oriented education***

4th year — LAUNCHING A CAREER IN CIVIL ENGINEERING

Wood Structures 2	6 cr
Management of Building Production	*3 cr*
Steel Structures 2	5 cr
Cost Management in Construction Project	*3 cr*
Energy Efficiency of Buildings	3 cr
Planning of Industrial Production	*3 cr*
Modelling Applications in Design	4 cr
Modelling Applications in Production	*4 cr*
Thesis	15 cr
Career Planning and Development 4	1 cr
Practical training	27 cr

3rd year — SPECIALIZING IN CONSTRUCTION TECHNOLOGY

Building Services Systems	3 cr
Concrete Structures 2	5 cr
Site Planning and Procurement	*5 cr*
Business and Entrepreneurship	3 cr
Construction Physics	5 cr
Concrete Construction 2	4 cr
Construction Contracting and Contract Technique	4 cr
Land Use Planning	2 cr
Expert Communications	3 cr
Career Planning and Development 3	1 cr
Complementary Studies	15/*30* cr
House Building 2	5 cr
Site Production Planning Methods	*5 cr*
Foundations in House Bulding	5 cr
Statically Indeterminate Structures	5 cr

2nd year — BASIC COMPETENCE IN CONSTRUCTION

Basics of Structural Design	3 cr
Strength of Materials	5 cr
Professional Communication in English	2 cr
Concrete Structures 1	5 cr
Wood Structures 1	5 cr
Quality Management and Mathematical Statistics	4 cr
Basics of Cost Management	3 cr
Career Planning and Development 2	1 cr
Design Project of Detached House	3 cr
Basics of Production Planning	3 cr
Foundations	5 cr
Svenska for Byggnadsingenjörer	2 cr
Measuring Technique	2 cr
Basics of Management	3 cr
Steel Construction	3 cr
Steel Structures 1	5 cr
Geotechnical Planning	5 cr

1st year — FAMILIARIZING WITH CIVIL ENGINEERING

Basics of House Building	3 cr
Wood Construction and Products	3 cr
English for Construction Engineering	3 cr
Reporting and Written Communication	2 cr
Construction Dynamics	4 cr
CAD Design and Modelling	3 cr
Algebra and Geometry	5 cr
Basics of Construction Economics	3 cr
Career Planning and Development 1	2 cr
Work Placement	3 cr
House Building	5 cr
Sociala kontakter i arbetslivet	3 cr
Chemistry for Construction	3 cr
Statics	5 cr
Thermodynamics and Fluid Mechanics	4 cr
Integral and Differential Calculus	5 cr
Concrete Construction 1	4 cr

Competence Requirements

Area of Competence	Description of Competence Bachelor of Engineering
Structure Design Competence	- is able to design building structures and use the most important building materials considering safety, healthiness , and economy - masters the static function of structures - knows structural physical and chemical phenomena - understands the effects of other design fields on structural design
Building Production Competence	- is able to develop, contract and manage the production of house constructions - has special knowledge on site practices in wood construction - knows the principles and methods of production management - is able to consider the effects of heating, plumbing, ventilation and sanitation technology as well as automation technology - is able to take into account the requirements of quality and safety in construction - knows the principles of entrepreneurship in construction
Wood Construction Competence	- knows the material properties of wood related to construction - is able to plan wooden high-rise buildings and knows the basics of site practices
Renovation Competence	- is able to assess and study the condition and usability of a building - knows the processes and technologies in renovation - knows the health effects of a building
Leadership Competence	- is able to perceive various management systems (quality management, safety and occupational well-being management, organizational management) - is able to see the significance of immediate superior work in organizations in construction field and is able to operate in the lead of a construction project - is able to instruct and motivate subordinates and to give feedback
Environmental Responsibility and Life Cycle Competence	- knows the principles of life cycle technology of a building and is able to apply the basic methods - is able to estimate the life time of a building - is familiar with the environmental effects of building products and production - knows the basics of building and real estate automation - is able to manage the costs in various stages of the life cycle
Ethical Competence	- is able to assume responsibility of one's actions and their consequences - is able to work according to the code of professional ethics of one's field - is able to take different parties into account - is able to apply the principles of equality - is able to apply the principles of sustainable development
Innovation Competence	- is able to solve problems and develop working methods innovatively - is able to work in projects - is able to carry out research and development projects and to apply existing knowledge and methods of one's field - is able to find customer-oriented, sustainable and profitable solutions

Internatio-nalisation Competence	- has the language competence necessary for the work in the field and its development - is able to cooperate with people from different cultural backgrounds - is able to take into account the opportunities and effects of internationalisation
Learning Skills	- is able to assess and develop one's competences and learning methods - is able to retrieve/search, process and analyse information critically - can assume responsibility for team learning and knowledge sharing
Work Community Competence	- is able to function as a member of a work community and to contribute to its work well-being - is able to function in various communication and interactive situations at work - is able to use information and communications technology in the tasks of one's field - is able to establish personal occupational contacts and to work in networks - is able to make decisions in new and unforeseen situations - is able to manage one's work and to work independently in tasks requiring expertise - has developed entrepreneurial skills