

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. The outlook is still promising. 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 of 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 180 credits and complementary studies 60 credits. The common core studies contain 30 credits of practical training (i.e. work placement) 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. Acquiring the necessary qualifications in structural design requires the completion of structure design modules (1-3) in complementary studies. Acquiring the qualifications in building production requires emphasizing the complementary studies in production planning and practical training in working life. A civil engineer's training gives the qualifications to work as a general supervisor as stated in the Land Use and Building Act. The following modules suit especially well to those who study in the Degree Program in Civil Engineering:

- Structural Design 1
- Structural Design 2
- Structural Design 3
- Innovative Timber Construction
- Building Production Planning
- Practical Training in Working Life 1
- Practical Training in Working Life 2
- Management and Supervision
- Innovation and Productizing
- Business Competence and Entrepreneurship
- Developing Competence in Ageing
- Expertise Pertaining to Russia
- International Studies 1
- International Studies 2
- 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)

If you are already an entrepreneur or thinking of becoming one, some core and complementary studies, international exchange, practical training and thesis can be combined with your business activities or developing your business idea. As an entrepreneur or if you are planning to become one, you have a possibility to get guidance and support in combining studies and entrepreneurship during your studies.

Complementary studies have been scheduled to take place in the spring semester of the third year and in 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 you're your teacher tutor or study counsellor.

CIVIL ENGINEERING

Bachelor of Engineering | 240 cr / 4 years



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

4th year

LAUNCHING A CAREER IN CIVIL ENGINEERING

Complementary Studies	30 cr	Thesis	10 cr
		Work Placement	20 cr
		Career Planning and Development	1 cr

3rd year

SPECIALIZING IN CONSTRUCTION TECHNOLOGY

Complementary Studies	15 cr	Work Placement	7 cr
Construction Physical Measurements	2 cr	Thesis	5 cr
Construction Physics	3 cr	Cost Management in Construction Projects	3 cr
Building Surveys and Inspections	5 cr	Complementary Studies	15 cr
Expert Communication	3 cr		
Career Planning and Development	1 cr		

2nd year

BASIC COMPETENCE IN CONSTRUCTION

Career Planning and Development	1 cr	Basics of Production Planning	3 cr
Basics of Management	3 cr	Foundations	5 cr
Contracts and Quality Management	5 cr	Concrete Structures	4 cr
Basics of Concrete Structures	4 cr	Svenska för Byggnadsingenjörer	2 cr
Geotechnical Planning	5 cr	Basics of Building Services Engineering	3 cr
Basics of Cost Management	3 cr	Use of Concrete on Site	3 cr
Basics of Wood Structures	4 cr	Modelling of Wood Structures	4 cr
Statically Determinate Structures	5 cr	Basics of Steel Structures	3 cr
		Professional Communication in English	2 cr

1st year

FAMILIARIZING IN CIVIL ENGINEERING

Career Planning and Development	2 cr	Work Placement	3 cr
English for Construction Engineering	3 cr	House Building and Land-Use Planning	5 cr
Reporting and Written Communication	2 cr	Sociala kontakter i arbetslivet	3 cr
Construction Dynamics	4 cr	Chemistry for Construction	3 cr
Algebra and Geometry	5 cr	Thermodynamics and Fluid Mechanics	4 cr
CAD-Designing and Modelling	3 cr	Linear Algebra and Differential Calculus	5 cr
Strength of Materials and Structural Mechanics	5 cr	Wood as Building Material	3 cr
Basics of Construction Economics	3 cr	Concrete as Building Material	5 cr
Basics of House Building and Building Materials	3 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