TECHNOLOGY AND TRANSPORT
Architecture and Construction
Electrical and Automation Engineering
Other Education in Technology and Transport
This brochure is divided into three sections as follows:
I: Architecture and Construction, Electrical and Automation Engineering, Other Education in Technology and Transport
II: Mechanical, Metal and Energy Engineering, Automotive and Transport Engineering, Information and Telecommunications Technology
III: Graphics and Communications Technology, Food Science, Food Industry and Biotechnology, Process, Chemical and Materials Engineering, Textiles and Clothing Technology

Qualifications in Construction impart the competence required in the construction phase of buildings and infrastructures and the maintenance of the built-up environment. Professionals in the construction sector engage in new construction and continuous maintenance of residential buildings, workplaces and recreational facilities as well as transport networks, various environmental structures, and water and energy supply networks. There is an essential difference between jobs at construction sites and those in mass production industries. Individual construction projects are implemented at their final sites following planning drawings and documents. While the advancement of working methods and tools has helped lighten the most cumbersome work phases, work at a building site still requires a good level of physical fitness. The construction sector has traditionally had rather close links with economic fluctuations, but a significant expansion in renovations and system maintenance has brought about a change in the sector. These jobs are independent of building sector trends and have contributed to stabilising the employment situation in the field.

The Electrical and Automation engineering sector offers jobs for various professionals in electricity production, distribution and transfer, electrification, repairs and maintenance of electrical installations, and automation and maintenance. Competence in these tasks is imparted by Vocational Qualifications, Further Qualifications, and Specialist Qualifications in Electrical and Automation Engineering. Jobs in the sector are extremely versatile, demanding and continuously developing. Professionals in Electrical and Automation Engineering install and service electrical and automation systems or distribution networks in buildings and plants. Customer service is an essential part of the Electrician's and Automation Assembler's job description. Those working in electrical and automation engineering need to be responsible and careful. Professionals in the sector must internalise electrical safety and quality thinking to ensure that installations and equipment work safely and reliably.

Other Education in Technology and Transport includes those qualifications that do not belong to the other training sectors. The skills requirements of these qualifications differ from one to another, as do the personal characteristics the duties call for and the employment opportunities they offer.
Vocational Qualifications
- Vocational Qualification in Land Surveying
  (1 study programme / competence area)
- Vocational Qualification in Construction
  (4 study programmes / competence areas)
- Vocational Qualification in Building Maintenance Technology
  (6 study programmes / competence areas)
- Vocational Qualification in Property Maintenance Services
  (2 study programmes / competence areas)
- Vocational Qualification in Technical Design
  (1 study programme / competence area)
- Vocational Qualification in Electrical and Automation Engineering
  (1 study programme / competence area)
- Vocational Qualification in Watchmaking and Micro-mechanics
  (2 study programmes / competence areas)
- Vocational Qualification in Safety and Security
  (1 study programme / competence area)

Further Qualifications
- Further Qualification in Land Surveying
- Further Qualification for Commercial Divers
- Further Qualification in Infrastructure Construction
- Further Qualification in Building Construction
- Further Qualification in the Building Products Industry
- Further Qualification in Technical Design
- Further Qualification in Building Construction
- Further Qualification in Water Supply and Sewerage
- Further Qualification for Stonemasons
- Further Qualification for Ventilation Pipefitters
- Further Qualification in Ventilation System Cleaning
- Further Qualification for District Heating Fitters
- Further Qualification for Property Maintenance Operatives
- Further Qualification in Refrigeration Fitting
- Further Qualification for Heating Equipment Fitters
- Further Qualification for Pipefitters
- Further Qualification in Technical Insulation
- Further Qualification for Construction Sheet Metal Workers
- Further Qualification for Automation Assemblers
- Further Qualification in the Electronics and Power Industry
- Further Qualification for Rail Traffic Safety Device Fitters
- Further Qualification for Household Appliance Fitters
- Further Qualification for Electricians
- Further Qualification for Power Plant Mechanics
- Further Qualification for Power Plant Operators
- Further Qualification in Stonecutting
- Further Qualification in Maintenance
- Further Qualification for Locksmiths
- Further Qualification for Chimneysweeps
- Further Qualification in Rolling Stock Maintenance
- Further Qualification for Security Guards
- Further Qualification in Waste and Recycling Management

Specialist Qualifications
- Specialist Qualification in Infrastructure Construction
- Specialist Qualification for Construction Site Managers
- Specialist Qualification in Building Construction
- Specialist Qualification for Ventilation Pipefitters
- Specialist Qualification for District Heating Fitters
- Specialist Qualification for Property Maintenance Operatives
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- Specialist Qualification for Construction Sheet Metal Workers
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VOCATIONAL QUALIFICATIONS

Vocational qualifications impart wide-ranging vocational competence needed in working life, specialist skills in the field, and capacity for further studies. The scope of a vocational qualification is 120 credits, mostly consisting of vocational qualification modules made up from on-the job work and activity packages. In addition to compulsory vocational modules of the qualification, there is a large selection of optional ones, for example those that are part of other vocational qualifications. It is also possible to individually expand the qualification. Upper secondary vocational education and training also contain modules complementing vocational skills and optional modules. A vocational qualification can be taken in 2-4 years, depending on the student's basic education and work experience.

A vocational qualification can be taken through vocational upper secondary education and training or as a competence-based qualification.

At their discretion, students or candidates can take one or several modules of the vocational qualification at a time, whenever this is appropriate for their placement in working life. In that case, a plan covering the entire vocational qualification is prepared.

FURTHER AND SPECIALIST QUALIFICATIONS

For further qualifications, the students or candidates demonstrate their mastery of vocational skills required of an employee in the field, and in specialist qualifications, mastery of the most demanding tasks in the field.

The further and specialist qualifications consist of on-the-job work and activity packages. Compulsory and/or optional modules of the qualification are determined in the qualification requirements. The scope of further and specialist qualifications or their parts is not determined in credits.

Further and specialist qualifications are taken as competence-based qualifications.
Vocational Qualification in Land Surveying
Land surveying professionals are adept in using information technology, which in this field is associated with the use of survey instruments, software, registers and maps, and in the shared use of geographical information and networking of tasks. They work actively and cooperatively in various interactive situations and express their views in a clear and confidence-inspiring manner. In the vocational qualifications, the specialisations offered are surveying, cadastral survey tasks, land-use planning, soil and environmental surveys or cartography, and geographical information tasks.

Jobs: Municipal land survey, property, planning and construction services, National Land Survey of Finland, private enterprises in the field, state institutions, own enterprise.

Title:
• Surveyor
Vocational Qualification in Construction

Holders of a Vocational Qualification in Construction carry out foundation phase jobs at a building site in compliance with quality requirements, handling materials carefully and economically. They are able to read both building construction and infrastructure construction drawings. Areas of specialisation in this qualification include building construction, infrastructure construction, earthmover operation, or masonry.

**Titles:**
- Builder
- Infrastructure Builder
- Earthmover Operator
- Stonemason

**Builders** (study programme/competence area in Building Construction) are engaged in building external and separation walls and roof frame structures with their insulation based on plans and documents. The study programme in Building Construction offers the specialisation areas of carpentry, masonry, concreting, steel construction, renovations, masonry, log construction, survey tasks, or multiple construction industry skills.

**Infrastructure Builders** (study programme/competence area in Infrastructure Construction) carry out ordinary infrastructure construction tasks and install municipal engineering drainage water and sewage systems and water mains, including their fittings. They direct excavation work carried out by earthmovers. The study programme in Infrastructure Construction offers the specialisation areas of hydraulic engineering, processing of soil and stone materials, rock construction, foundation strengthening, asphalt paving, soil surveys, garden landscaping, stonemasonry, survey tasks, or multiple construction industry skills.

**Earthmover Operators** (study programme/competence area in Earthmover Operators) are competent in operating at least one earthmoving machine safely and in observance of instructions and regulations at ordinary infrastructure construction sites. They carry out the most common tasks of surveying and marking out associated with ordinary infrastructure construction. In the study programme for earthmover operators, the students can specialise in operating road maintenance machines, transport of soil, hydraulic engineering, processing of soil and stone materials, rock construction, foundation strengthening, asphalt paving, garden landscaping, or multiple construction industry skills.

**Stonemasons** (study programme/competence area in Stonemasonry) follow drawings to produce various construction stone products for interior design, façade and environmental construction, and garden landscaping. They build foundation structures following plans and engage in interior decoration and facade stonework, build fireplaces, and lay environmental and garden stone structures. In the study programme in stonemasonry, students may specialise in the manufacture of construction stone products, construction stonemasonry, environmental stone laying, excavation, or multiple construction industry skills.

**Jobs:** construction and infrastructure construction sites, international building projects, construction material production plants, design
agencies, state and municipal construction services, own enterprise.

**Vocational Qualification in Building Maintenance Technology**

Holders of a Vocational Qualification in Building Maintenance Technology are able to read drawings associated with both building construction and HVAC systems. They pay careful attention to promoting occupational safety and their ability to work. Environmental awareness in the building maintenance technology sector requires actors in the field to acquire new information about such areas as material properties and, above all, the energy efficiency of various solutions. The vocational qualification offers the specialisation areas of pipe, ventilation, heating or refrigeration fitting, technical insulation, or construction sheet metal work.

**Titles:**

- Pipefitter
- Heating Equipment Fitter
- Ventilation Pipefitter
- Refrigeration Fitter
- Technical Insulation Fitter
- Construction Sheet Metal worker

**Pipe or Heating Equipment Fitters** (study programme/competence area in Pipefitting) fit pipes for the water supply, sewage and heating systems of new constructions following plans and work specifications. In the study programme of pipefitting, the students can specialise in pipefitting or heating equipment fitting. In addition to normal pipe fitting work, Heating Equipment Fitters also install burners used for heat supply in buildings observing official regulations.

**Ventilation Fitters** (study programme/competence area in Ventilation Fitting) fit pipes and equipment for ventilation systems in new constructions following drawings and work specifications. They make ventilation system duct components.

**Technical Insulators or Construction Sheet Metal Workers** (study programme/competence area in Insulation and Sheet Metal Work) engage in sheet metal work on the external cladding of buildings. Technical Insulators also fit insulation associated with building maintenance systems and process industries with their coatings. Construction Sheet Metal Workers carry out sheet metal work, fit sheet metal components of building facades and install felt, tile and profile elements on roofs as well as carry out sheet metal work on seam metal roofs.

**Refrigeration Fitters** (study programme/competence area in Refrigeration Fitting) fit refrigeration equipment and pipes following drawings and work specifications.

**Jobs:** Building maintenance technology enterprises, property maintenance companies, state and municipal construction services, process and other industries, own enterprise.

**Vocational Qualification in Property Maintenance Services**

Holders of a Vocational Qualification in Property Maintenance Services engage in building maintenance or cleaning tasks. The property maintenance services sector comprises all repair, service and maintenance services of a build-
ing, as well as the various services needed by building users in their facilities, such as cleaning, reception, security, porter’s, conference and mailing services.

**Titles:**
- Property Maintenance Operator
- Site Facilities Operative

**Property Maintenance Operators** (study programme/competence area in Property Maintenance Services) carry out property maintenance and technical system servicing tasks based on property maintenance contracts. They assess whether a property is being used in compliance with the maintenance contract conditions. Property Maintenance Operators may specialise in the maintenance of ventilation equipment, assessing the operating condition of a property, use of building automation technology, construction technical repairs, maintenance of outdoor areas, servicing of heating and water supply systems, chimney-sweeping and cleaning of ventilation systems.

**Site Facilities Operatives** (study programme/competence area in Site Facilities Operatives) carry out maintenance and basic cleaning tasks of buildings as detailed in service contracts. They assess whether a property is being used in compliance with the service contract conditions. Site Facilities Operatives may specialise in construction period cleaning, office services, sanitation of wet facilities, cleaning of industrial facilities, cleaning of transport vehicles and cleaning of shops and outlets.

**Jobs:** property maintenance enterprises, municipal and state construction services, public areas of companies and government offices.

**Vocational Qualification in Technical Design**
Holders of this qualification carry out tasks related to technical design modelling, combining and transferring product models, producing and updating drawings and documents, preparing different publications relevant to design and planning, and the marketing and advertising of products using the means offered by modern technology. Professionals in this field produce models, plans, and documents, based on which new construction, HVAC, electrical, machinery, and infrastructure sector products may be built and existing ones maintained and renovated. Qualification holders work as technical drawers, design assistants and junior designers. Their tasks also include customer service and participation in the maintenance of equipment and upgrading of programmes.

**Jobs:** enterprises, municipal and state agencies, enterprises producing construction, HVAC, electrical and machinery sector drawings and publications, own enterprise.

**Title:**
- Design Assistant
FURTHER QUALIFICATIONS

**Further Qualification in Land Surveying**
The qualification requirements will be completed in 2011. Holders of a Further Qualification will work in cadastral survey, cartography and map production tasks. **Jobs:** state and municipal organisations and private enterprises specialising in cartography, map production, land-use planning and soil surveys, own enterprise.

**Further Qualification for Commercial Divers**
Holders of a Further Qualification for Commercial Divers dive equipped with surface-supplied diving systems and dry suits. They are competent in safe scuba diving in summer and winter conditions. Qualification holders master the techniques of underwater work and are able to set up an underwater site. They may work as divers in specialist tasks. **Jobs:** construction and other industries, power stations, and inland waterway and marine shipping companies.

**Further Qualification in Infrastructure Construction**
Qualification holders’ tasks may include operating earthmovers, snow removal and smoothing of road surfaces, 3D positioning or control of earthmovers, charging, concrete injection of rock, impact piling, tasks related to anchoring and supporting walls, garden construction, landscaping, environmental stonework, municipal engineering construction work, water supply and water supply maintenance, dredging and asphalt paving. **Jobs:** infrastructure construction sites, interna-
tional construction projects, state and municipal construction services, own enterprise.

**Further Qualification in Building Construction**

Holders of this qualification work at construction sites in supervisory tasks and direct the implementation of individual building construction tasks. They lead and develop team work and work together with other parties at the site. They inspect drawings and plans, are able to initiate a plan review, and supervise the completion of tasks as agreed.

**Jobs:** building and infrastructure construction sites, international construction projects, state and municipal construction services, own enterprise.

**Further Qualification in the Building Products Industry**

Holders of this qualification work as professional operators in the manufacturing of concrete or ceramic products, mineral-based building insulation materials, mineral-based building boards, basic materials, or pressed building blocks. They may work in plants and companies manufacturing building materials in tasks of their own competence area.

**Jobs:** building materials industry production plants.

**Further Qualification in Technical Design**

Qualification holders may work as Design Assistants in design agencies that specialise in the construction, HVAC, or electrical engineering sectors. They produce simple construction drawings, HVAC drawings, and wiring diagrams for properties based on instructions and drafts and use one common CAD application. They are able to draw up documents that are standards-compliant and to archive documents.

**Jobs:** design agencies specialising in construction, HVAC, or electrical engineering.

**Further Qualification in Building Construction**

Holders of this qualification may work in construction site tasks determined by the qualification modules of their choice, for example, in the following fields: building surveying, foundation earth-work, in-situ form work, concrete reinforcement, concreting, installation of precast concrete elements, timber frame work, manufacturing of prefabricated timber elements, log construction, door and window fitting, ceiling work, ashlar and small element masonry, fireplace masonry, plastering, tiling, water-proofing in wet areas, roof water-proofing, steel frame work, installation of metal frame elements, tower crane operation, renovation work and scaffolding work.
Jobs: building construction sites, international construction projects, construction material production plants, state and municipal construction services, own enterprise.

Further Qualification in Water Supply and Sewerage

Holders of this qualification work in various water supply tasks. Determined by their choices, they will have the competence to work in raw water purification or sewage treatment processes, dose chemicals, and maintain systems in working order. Those having selected the water supply, sewerage and drainage systems module engage in typical management, inspection, maintenance, construction, and renovation tasks of water supply, sewage, and drainage water systems as well as fit service piping and water metres.

Jobs: water supply and sewerage plants (waterworks, waste water treatment plants, network systems), HVAC enterprises.

Further Qualification for Stonemasons

Determined by the specialisation of their choice, qualification holders work in stone excavation, processing, or laying tasks.

Jobs: building and infrastructure construction sites, international building projects, construction industry production plants, state and municipal construction services, own enterprise.

Further Qualification for Ventilation Pipefitters

Holders of a Further Qualification for Ventilation Pipefitters may work in demanding installation, service and repair tasks of ventilation systems. They are competent in measuring, grinding, drilling and threading, spot and seam welding as well as seaming, preparing fittings and duct components and their assembly.

Jobs: Building maintenance technology enterprises, property maintenance companies, state and municipal construction offices, process and other industries, own enterprise.

Further Qualification in Ventilation System Cleaning

Qualification holders know how to commission air conditioning systems, service them and their components and check the condition of a ventilation system. They are competent in assessing the cleanliness and need for cleaning of ventilation systems. They clean terminal devices, various air distribution systems, convectors, chilled beams and grease ducts. They disinfect air conditioning systems, perform servicing tasks during cleaning work, and carry out routine sheet metal work.

Jobs: Building maintenance technology enterprises, property maintenance companies, state and municipal construction offices, process and other industries, own enterprise.
Further Qualification for District Heating Fitters
Holders of a Further Qualification for District Heating Fitters operate, service and repair district heating centres, networks and customer equipment. They may work in the construction, operation, and maintenance tasks of a heat plant, district heat networks, and heat distribution centres of buildings. **Jobs:** HVAC enterprises, municipal construction services, own enterprise.

Further Qualification for Property Maintenance Operatives
Holders of a Further Qualification for Property Maintenance Operatives may work in tasks related to the management, maintenance and repair of buildings. These tasks include servicing and repairing heating equipment, water and sewage systems of buildings, individual water supply fittings, and most common ventilation systems and ventilation machinery. They also manage routine paintwork and surface repairs of a building, as well as perform adjustments, services, and repairs that ensure the functioning of doors, windows and locks. **Jobs:** Building maintenance technology enterprises, property maintenance companies, state and municipal construction offices, own enterprise.

Further Qualification in Refrigeration Fitting
Holders of a Further Qualification in Refrigeration Fitting independently and appropriately install, set up, and adjust refrigeration plants, and repair and service refrigeration equipment. They can work in installation, adjustment, operation, trouble-shooting, repair, and service tasks of refrigeration equipment.
Jobs: enterprises selling and servicing refrigeration equipment, own enterprise.

Further Qualification for Heating Equipment Fitters
Holders of a Further Qualification for Heating Equipment Fitters assemble, install, connect, and service oil, gas and pellet heating systems and heat pump heating systems used in single-family houses. They may work in installation, repair and servicing tasks of heat production and distribution systems for buildings.

Jobs: Enterprises selling and servicing refrigeration equipment, own enterprise.

Further Qualification for Pipefitters
Holders of a Further Qualification for Pipefitters install plumbing and heating systems and equipment and measure, adjust, service and repair HVAC equipment. Determined by their area of specialisation, they carry out pipefitting work, servicing and repairs of fire-extinguishing, oil heating and pneumatic systems. They work in demanding installation, service and repair tasks in the field.

Jobs: Building maintenance technology enterprises, property maintenance companies, state and municipal construction services, process and other industries, own enterprise.

Further Qualification in Technical Insulation
Holders of a Further Qualification in Technical Installation fit and support insulations and coatings. Determined by their selections, their competence may be specialised in industrial installation or building maintenance insulation. They may also specialise in cold insulation, fire-proof insulation, sound insulation, ship insulation and high-temperature insulation.

Jobs: building maintenance technology enterprises, process and other industries, own enterprise.

Further Qualification for Construction Sheet Metal Workers
Holders of a Further Qualification for Construction Sheet Metal Workers engage in tasks related to the manufacture and installation of sheet metal components for buildings. They dimension components for felt and tile roofs as well as profile and seam metal roofs, manufacture roof structures, and carry out installation work on roofs. They produce and install structures for profile metal, beam, and cassette walls.

Jobs: Enterprises in the sheet metal field, own enterprise.

SPECIALIST QUALIFICATIONS

Specialist Qualification in Infrastructure Construction
Holders of a Specialist Qualification in Infrastructure Construction may work in demanding professional tasks in the infrastructure construction sector. In gang supervision tasks, they conclude contracts and get together the required labour. Their tasks also include planning the work order and assignment of jobs. Those having selected the infrastructure surveying module are competent in preparing survey plans for a site and carrying out surveys using various instruments. Those having selected the specialisation in bulk goods and oversized transports know how to load and operate an articulated vehicle. Those having selected the specialisation in excavation and blasting work have the competence to act as blasting site managers in residential areas.
Jobs: infrastructure construction sites, international construction projects, state and municipal construction services, own enterprise.

Specialist Qualification for Construction Site Managers
This qualification is intended for those who have a technician’s, engineer’s, or M.Sc. (Eng.) qualification and experience in site supervision tasks or other similar competence. Qualification holders work at sites in demanding supervisory tasks and direct work implementation. At ordinary sites, qualification holders also act as responsible site managers. They assume responsibility for completing the construction work in accordance with schedules, cost targets and quality requirements. They also provide the requisites for safe working and ensure the preparation and implementation of various purchasing and work contracts as required by targets.

Jobs: building construction, infrastructure construction, or renovation sites, own enterprise.

Specialist Qualification for Ventilation Pipefitters
Qualification holders work in various demanding tasks in the ventilation sector. Their tasks include installations of ventilation ducts, machinery room ventilation ducts and associated equipment, manufacturing and assembling duct components, and examining and repairing ventilation system faults. The requirements of this qualification will be revised in 2011.

Jobs: Building maintenance technology enterprises, property maintenance companies, state and municipal construction services, own enterprise.

Specialist Qualification for District Heating Fitters
Qualification holders may work in demanding professional assignments as well as work induction and supervisory tasks in the installation, servicing and repairs of district heating plants and systems as well as customer equipment.

Jobs: Energy production plants, enterprises in the sector, own enterprise.

Specialist Qualification for Building Construction
Holders of this qualification may work in construction site tasks determined by the qualification modules of their choice and take on supervisory tasks at the site. The requirements of this qualification will be revised towards the end of 2010.

Jobs: building construction or renovation sites, own enterprise.

Specialist Qualification for Property Maintenance Operatives
Holders of this qualification work in various demanding property maintenance tasks, including seasonal service and maintenance jobs as well as servicing and repairs of heating equipment, water and sewage systems, water supply fittings and ventilation systems.

Jobs: property maintenance enterprises, own enterprise.
Specialist Qualification in Refrigeration Fitting
Qualification holders may work in various demanding project management, planning and supervisory tasks in the sector. Their tasks may include drawing up a refrigeration plan including the required documents, cost estimates, schedules and resources. Qualification holders are competent in the safe handling of refrigerants, connecting and replacing electrical equipment, and working in compliance with laws and regulations applicable to the sector.

Jobs: enterprises selling and servicing refrigeration equipment, own enterprise.

Specialist Qualification for Pipefitters
Holders of this qualification may work in various demanding HVAC sector tasks, including installations, servicing and repairs of hot water district heating networks, equipment and fittings and plumbing in residential buildings. They plan and direct activities in their work.

Jobs: Building maintenance technology enterprises, property maintenance companies, state and municipal construction services, own enterprise.

Specialist Qualification for Construction Sheet Metal Workers
Qualification holders may work in demanding tasks and in a supervisory role in the manufacturing and installation of sheet metal components for buildings. They measure components for felt, tile, profile and seam metal roofs, manufacture roof structures, and carry out installations on roofs. They dimension and produce drainage water systems, lathing, and roof safety products. They produce and install structures for profile metal, beam and cassette walls.

Jobs: Enterprises in the sheet metal field, own enterprise.
Vocational Qualification in Electrical and Automation Engineering
Holders of a Vocational Qualification in Electrical and Automation Engineering have the competence needed in installation, service and maintenance tasks of the electrical and automation sector. Determined by their specialisation area, Electricians carry out electrical and building automation installations associated with electrical building technology, or tasks related to installation, servicing and maintenance of the power supply network. Automation Assemblers carry out installation and maintenance tasks associated with process or manufacturing automation.

Titles:
- Electrician
- Automation Assembler

Electricians (study programme/competence area in Electrical and Automation Engineering) carry out electrical installations in residential, business, office, industrial or public buildings and tasks associated with their operation, service and maintenance in compliance with applicable standards and regulations. They may also carry out tasks related to the installation, operation, service and maintenance of the power supply network in compliance with applicable standards and regulations. Jobs: electrical installation enterprises, companies maintaining power networks, electrical plants.

Automation Assemblers carry out tasks related to the installation, operation, maintenance and servicing of industrial electrical machinery and equipment as well as automation systems in compliance with applicable standards and regulations.

Jobs: process and automation industries.
**Further Qualifications**

**Further Qualification for Automation Assemblers**
Determined by their specialisation area, qualification holders carry out automation sector installations, repairs and maintenance related to process, manufacturing, or building automation. They master troubleshooting and are able to utilise troubleshooting and maintenance system software. They commission systems together with operators and give operator training. They master installation period occupational and electrical safety and are able to inspect their work to ensure that the end result of an automation installation is functional, safe and appropriate, allowing the process work reliably. They have a valid certificate for Electrical Safety Code Examination 3.

**Jobs**: process and automation industries.

**Further Qualification in the Electronics and Power Industry**
Holders of this qualification master one manufacturing technology module (manufacturing of electronic products, printed circuit board assemblies, printed circuit boards, components, electrical products, electrical machinery or cables and conductors) and one production process management module (production management systems, quality inspection and testing, basic statistical concepts, cleanroom technology and culture or materials administration functions and logistics).

**Jobs**: enterprises manufacturing electronic and electrical engineering products.

**Further Qualification for Rail Traffic Safety Device Fitters**
Holders of this qualification carry out and inspect electrical work related to safety device installations. They take into consideration electrical and rail transport safety while work is in progress, as well as regulations, standards and guidelines applicable to their work. They are familiar with safe operating modes of train control devices, and install and service devices following instructions. They also master four of the following modules: train control, cabling, level crossing equipment, power supply equipment, blocking, hump equipment and remote control devices. They are familiar with the systems, structures and operation of the module of their choice. They carry out troubleshooting, service and maintenance tasks and document their work. They are able to use a computer and the required software in different systems.

**Jobs**: enterprises carrying out and servicing rail traffic safety device installations.

**Further Qualification for Household Appliance Fitters**
Holders of this qualification guide customers in selecting and using appliances, taking any valid regulations and recommendations as well as consumer protection legislation into consideration in their activities. They have a valid certificate for Electrical Safety Code Examination 3. They master the field of specialisation of their choice – the installation, repairs and maintenance of household appliances (washing, refrigeration, heating and small appliances) or institutional appliances (institutional dishwashers, heating equipment, refrigeration equipment and washing machines) and carry out the required safety measurements.
Jobs: enterprises engaging in installations and servicing of household and/or institutional appliances, own enterprise.

Further Qualification for Electricians
Qualification holders carry out electrical and device installations of buildings determined by the modules of their choice, such as communication and information network systems, security systems and sound and image systems, taking into consideration occupational and electrical safety while the work is in progress. They inspect their own work to ensure that the final result of an electrical installation is safe and appropriate for the end user. They are able to progress in their work in observance with the project schedule, taking other vocational groups into consideration. They have a valid certification for Electrical Safety Code Examination 2.

Jobs: electrical installation companies, own enterprise, industries.

Further Qualification for Power Plant Mechanics
Holders of this qualification ensure occupational and electrical safety while they work. They comply with structural and testing regulations in standards and regulations concerning high tension overhead lines. They are able to read maps, structural drawings and working diagrams. They select installation materials and draw up cost, schedule and material calculations. They complete installations ensuring that the end result is as economical and usable as possible for the electricity user, power distribution system and the customer. They take the requirements imposed by the environment into account in their work. They have a valid certification for Electrical Safety Code Examination 2.
Jobs: electricity plants, companies maintaining power networks.

Further Qualification for Power Plant Operators
Holders of this qualification work in power plant operation tasks. They are familiar with the most common process equipment and the operation of power plant processes. They know how to operate the power plant's electrical and automation equipment and its computer hardware, and they have the competence to act appropriately in case of faults. They master the principles of process measurements and act in compliance with occupational safety, pressure vessel, electrical safety and chemicals legislation.
Qualification holders have the training required by Decree 891/1999 for an Assistant Engineer's certificate and class A and B Engine Attendant's certificate. Another requirement for being issued a certificate of competency is having the work experience detailed in Decree 891/1999. A holder of this certificate may work as an operation supervisor or operation staff supervisor in a steam or hot water boiler plant. They may also single-handedly assume responsibility for tasks related to boiler function and operation.
Jobs: thermal and power plants.
SPECIALIST QUALIFICATIONS

Specialist Qualification for Automation Assemblers
Holders of this qualification master the structures, logistic programming, bus technology, user interfaces, electrical motors and motor drives, power distribution systems, electrical engineering and mechanical installations of automation systems. They carry out electrical work in compliance with regulations and observe occupational and end-user safety. They have a valid certificate for Electrical Safety Code Examination 2. They master the commissioning and servicing tasks of automation systems, including measurements and documentation, or work supervision (schedules, personnel resources, risks, costs, accountability, quality assurance, concluding contracts, management, production control). They are able to induct, train, and guide employees in their work. They also master one of the following modules: manufacturing, process or building automation, or CNC technology.
Jobs: industries, maintenance enterprises.

Specialist Qualification for Power Plant Mechanics
Holders of this qualification have the vocational skills needed for independent work, team work and team leading. They carry out construction, measurement, protection and operation tasks and various connection and fault repair assignments. They master project management in their work (administration of regulations and files, tender calculation, site kick-off, completing the work and site handover). They observe the safety and supervision requirements that are part of their work. They are also able act as supervisors. They may additionally engage in power network planning tasks or customer service. They have a valid certificate for Electrical Safety Code Examination 1.
Jobs: companies maintaining power networks.

Specialist Qualification for Electricians
Holders of this qualification have the vocational skills needed for independent work, team work and team leading. They are adept in planning and carrying out electrical installations, tender preparation, cost monitoring, commissioning and inspection and documentation tasks related to buildings, in addition to which they master three more restricted areas (communication and information networks, security and fire safety systems, image and sound systems, building automation systems, electrical motor drives, manufacturing and process automation, programmable logic controllers, UPS distribution systems and backup power systems, ship engine, deck and interior outfitting systems). They are competent in project management and are also able to act as supervisors. They have a valid certificate for Electrical Safety Code Examination 1.
Jobs: electrical installation enterprises, industries.
OTHER EDUCATION IN TECHNOLOGY AND TRANSPORT

VOCATIONAL QUALIFICATIONS

Vocational Qualification in Watchmaking and Micromechanics
Holders of this qualification make, repair and service watches and micromechanical devices. They locate faults in watches and micromechanical devices visually and by measurements and repair them. They plan their work based on work drawings and instructions and are competent in small-scale development of their own working methods and tools as well as product development. They make small and dimensionally accurate watch and micromechanical device components and tools needed in their work.

Titles:
- Watchmaker
- Micromechanic

Watchmakers (study programme/competence area in Watchmaking) specialise in repairs of watches, gauges and similar precision instruments and the manufacture of their components. Jobs: Watchmaker’s and goldsmith’s shops, own enterprise.
**Micromechanics** (study programme/competence area in Micromechanics) specialise in working in product development groups of the precision instrument industry, manufacture of prototypes or small runs and the manufacture of other unique items made by hand.

**Jobs:** workshops manufacturing precision mechanical products, the electronics industry.

**Vocational Qualification in Safety and Security**
Qualification holders may work in different types of security tasks, rescue services, planning, installation and maintenance tasks of security protection, goods transport, reception and porter’s services or security checks. They are able to draw up basic threat or risk analyses associated with company security and drafts for preventive security plans, and they work together with central official and other organisations in the sector.

**Jobs:** security sector companies, security guarding of service organisations and industries, public authorities.

**Title:**
- Security Officer

**FURTHER QUALIFICATIONS**

**Further Qualification in Stonecutting**
Holders of this qualification are familiar with the stone industry and understand their own work and field of specialisation as part of the entire sector. They are competent in using and servicing the machines and tools needed in work performances. The specialisation areas are quarrying, processing and installation.

**Jobs:** enterprises that quarry, process and install stone.

**Further Qualification in Maintenance**
Depending on their choices, qualification holders engage in some of the following maintenance tasks: they carry out installation, troubleshooting and repair work of automation and electrical devices and systems. They perform lubrication maintenance and install, service and repair hydraulic and pneumatic systems and proportional and servo systems. They install, service and maintain pumps, valves, pipe systems and other process equipment as well as power transmissions and bearing applications. They engage in assembly, installation and repair welding and make simple components using ordinary working methods. They are competent in anti-corrosion protection and carry out condition monitoring measurements.

**Jobs:** industries, service sector enterprises.

**Further Qualification for Locksmiths**
Holders of this qualification assess a customer’s security needs and present security service possibilities and options to the customer. They are familiar with and understand the most recent legislation, decrees and regulations applicable to their field. They master structural protection, they are familiar with the uses of mechanical locks and locking devices as well as electromechanical locks, and they select locks and fittings for the requirements of the site. They carry out installations and services of the most common turning, fire and overhead door and gate mechanisms. They install and service bus bars. They are able to install two of the following: video surveillance systems, alarm systems, and access control systems.

Locksmiths are security services suppliers referred to in the Private Security Service Act (282/2002), and locking device and system installations carried out by them are security
protection tasks that require police approval. A security officer identity card is needed to work in vocations in this field and in the practical job assignments needed to acquire vocational competence.

**Jobs:** security sector and locksmith enterprises, own enterprise.

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**Further Qualification for Chimneysweeps**

Qualification holders are competent in sweeping fireplaces and flues. They are familiar with the regulations, guidelines and recommendations in their sector. They observe service needs at sites, are familiar with repair techniques, and manage maintenance tasks. They advise and guide customers in matters of operation, service and planning related to combustion, fireplaces and flues, and to shortcomings and risks affecting fire safety. They recognise ordinary faults in ventilation systems and are able to service these systems.

**Jobs:** chimney sweeping enterprises, municipalities, own enterprise.

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**Further Qualification in Rolling Stock Maintenance**

Qualification holders master the maintenance, maintenance systems and preventive maintenance of the stock type of their choice. They assess faults, carry out minor repairs, services and general overhauls, and draw up documents related to their work. They measure and test equipment and systems in their area of responsibility and know how to interpret the results. They work in compliance with electrical and fire safety regulations.

**Jobs:** depots and workshops.

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**Further Qualification for Security Guards**

Holders of this qualification work in guard services and take into consideration risks associated with their work and the customer service nature of their vocation. They are familiar with legislation applicable to their tasks. They are competent in acting appropriately in situations involving accidents, problems and threats, and they assist in fire and rescue operations. They know how to use security and communications systems. They also master two of the following areas: reception services, local guard services, district guard services and emergency operations, store security, public order, transport security, personal security, security checks, and fire-fighting.

**Jobs:** Security sector enterprises, companies, public organisations.

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**Further Qualification in Waste and Recycling Management**

Holders of this qualification plan waste management, give advice in waste management issues, or are engaged in administrative tasks of environmental management. They may also sort, process, transport or receive waste, take care of sink and sewer management and maintenance of on-site waste water treatment plants, or engage in industrial cleaning. As part of these tasks, they handle, store or transport chemicals.

**Jobs:** plants sorting and processing waste, composting plants, waste treatment centres, sites or plants for rehabilitating contaminated soils, enterprises offering environmental management and sink and sewer maintenance services, enterprises providing industrial cleaning services, enterprises offering maintenance services for on-site waste water treatment systems, public administration, own enterprise.
SPECIALIST QUALIFICATIONS

Specialist Qualification in Maintenance
Qualification holders master two of the following competence areas: supervision (knowledge in planning and implementing short-term activities in their area of responsibility), condition monitoring (knowledge in taking measurements, analysing their results and suggesting measures), process equipment (knowledge in dimensioning and selecting as well as installing, repairing and servicing process equipment), and automation (knowledge in dimensioning and selecting as well as installing, repairing and servicing automation equipment). Additionally, they master several of the listed competence areas, or alternatively such areas as installation, troubleshooting and repair of electrical equipment and systems, or installation, servicing and maintenance of power transmission equipment and bearing applications.

Jobs: industries, service sector enterprises.

Specialist Qualification for Locksmiths
Qualification holders analyse and assess crime risks in association with protection of property and are able to choose correct risk management and protection methods. They analyse the customer's security needs and offer a system that is suitable in terms of costs and customer needs. They draw up security contract tenders, conduct commercial negotiations, manage and fulfil a security contract, hand the job over to the customer, provide user guidance, meet their warranty period responsibilities and calculate contract profitability. In the planning and installation, they apply the security standards and guidelines of their vocational field. Locksmiths are security services suppliers.
referred to in the Private Security Service Act (282/2002). Locking device and system installations they carry out are security protection tasks that require police approval. A security officer identity card is needed to work in the vocations of this field and in the practical job assignments needed to acquire the vocational competence. Jobs: security sector and locksmith enterprises, own enterprise.

Specialist Qualification for Chimney Sweeps
Holders of this qualification sweep fireplaces, heating system boilers and flues efficiently, appropriately and tidily. They advise and guide customers in matters of operation, service and planning related to combustion, fireplaces and flues, and to shortcomings and risks affecting fire safety. They act as experts in their sector in fire safety inspections and preliminary inspections of buildings. They recognise ordinary faults in ventilation systems and are able to service these systems. They master customer service and the marketing of services they provide and are able to develop their service products in response to demand. They have good knowledge and skills in planning the activities of a chimney sweeping enterprise, business management and direction. Jobs: chimney sweeping enterprises, municipalities, own enterprise.

Specialist Qualification in Technology
Holders of this qualification independently manage the daily activities and staff of their area of responsibility, ensuring that the activities are economical and efficient. They manage customer relationships and take customer needs and requirements into account. They plan and implement short-term processes in their area of responsibility. They also plan, implement, assess and develop activities in an area of their choice over the longer term (process management, human resources management, customer service management, entrepreneurship). Jobs: technology sector companies.

Specialist Qualification in Product Development
Professionals in product development prepare and carry out product development work and master the methods supporting it. They are familiar with measures related to protecting a product and know how to report the results of a product development project. In this vocation, the product to be developed is often a combination of a service and a physical product. As a rule, the work is carried out as a team effort. Jobs: product development departments of companies, own enterprise.
Specialist Qualification for Security Officers
Qualification holders analyse the customer’s security needs and are able to draw up a risk assessment. They draw up draft security plans of various levels and guide the organisation in issues relevant to planning. They assess the cost-benefit ratio of different security solutions. In their work, they comply with the legislation applicable to private security and the private security sector and other legislation that essentially regulates the sector. They also master two of the following areas: basics of security business operations and a guard’s work, security management, security technology, information security, international security operations, and entrepreneurship.
Under Section 20 of the Private Security Services Act (282/2002), a person may be approved as the manager of a security company if he or she has completed the following modules as part of the Specialist Qualification for Security Officers: security legislation, basics of security business operation and guard work, and one optional module. They also meet the other criteria imposed on them by the legislation.
**Jobs:** security companies, enterprises.

Specialist Qualification in Waste and Recycling Management
Qualification holders work as supervisors in environmental management, water supply or environmental education tasks, or develop activities at their own workplace.
**Jobs:** environmental management sector companies, water supply plants, waste processing centres.
OPPORTUNITIES FOR FURTHER STUDY

Vocational qualifications and further and specialist qualifications give the student a general eligibility for further studies at universities of applied sciences and universities. A natural path for further studies is a bachelor’s degree (Engineering) in the field of technology and transport from a university of applied sciences. At universities, students can take a bachelor’s or master’s degrees in technology and engineering. Pedagogical studies for a vocational teacher give eligibility for further education in the tasks of a vocational teacher.

For more information, visit:
www.oph.fi
www.koulutusnetti.fi
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