

## Degree Certificate

No. [REDACTED]

Technology, Communication and Transport

[REDACTED]

[REDACTED]

has completed the degree of

Tekniikan ammattikorkeakoulututkinto, Bachelor of Engineering (240 cr)

in the Degree Programme in Information Technology

professional major smart iot systems

in accordance with the Act of Parliament on Universities of Applied Sciences (932/2014).

The degree entitles the holder to use the Ministry of Education and Culture authorised title of

Insinööri (AMK), Bachelor of Engineering

The achieved credits are assessed in the supplement.

Espoo 20 January 2025



Riitta Konkola  
President

This document is signed electronically.

|                |                                            |                      |        |
|----------------|--------------------------------------------|----------------------|--------|
| Student        |                                            | Graduated 20.01.2025 |        |
| Programme      | Degree Programme in Information Technology | Credits              | 240 cr |
| Specialisation | Professional Major Smart IoT Systems       | Completed            | 245 cr |

| Studies                                                      | Credits      | Assessment          |
|--------------------------------------------------------------|--------------|---------------------|
| <b>Orientation to Information Technology</b>                 | <b>60 cr</b> |                     |
| Orientation                                                  | 15 cr        | 5 Excellent         |
| Mobiles                                                      | 15 cr        | 3 Good              |
| Smart Devices                                                | 15 cr        | 4 Very good         |
| Linux and Networks                                           | 15 cr        | 4 Very good         |
| <b>Fundamental Professional Studies</b>                      | <b>30 cr</b> |                     |
| <b>Basics of Smart IoT Systems</b>                           | <b>30 cr</b> |                     |
| C Programming in IoT Devices                                 | 5 cr         | 3 Good              |
| Switching, Routing and Wireless Essentials                   | 5 cr         | 5 Excellent         |
| Engineering Mathematics                                      | 5 cr         | 2 Very satisfactory |
| Object-Oriented Programming in IoT Devices                   | 5 cr         | 3 Good              |
| Enterprise Networking, Security and Automation               | 5 cr         | 4 Very good         |
| Probability and Statistics                                   | 5 cr         | 4 Very good         |
| <b>Advanced Professional Studies</b>                         | <b>55 cr</b> |                     |
| <b>Smart IoT Systems</b>                                     | <b>55 cr</b> |                     |
| IoT Connecting Things                                        | 5 cr         | 2 Very satisfactory |
| Mathematics and Physics for IoT                              | 5 cr         | 3 Good              |
| Linux Servers and Databases                                  | 5 cr         | 4 Very good         |
| IoT Devices and Wireless Communication                       | 5 cr         | 2 Very satisfactory |
| Sensor Physics                                               | 5 cr         | 3 Good              |
| <b>IoT and Networks</b>                                      | <b>30 cr</b> |                     |
| Virtualization and Cloud Computing                           | 5 cr         | 5 Excellent         |
| IoT Security                                                 | 5 cr         | 5 Excellent         |
| Advanced Routing and Switching in Modern Enterprise Networks | 10 cr        | 4 Very good         |
| IT Security                                                  | 5 cr         | 5 Excellent         |
| Windows Servers                                              | 5 cr         | 5 Excellent         |
| <b>Innovation Studies</b>                                    | <b>15 cr</b> |                     |
| Multidisciplinary Innovation Project                         | 10 cr        | H Pass              |
| Methodological Studies                                       | 5 cr         | H Pass              |
| <b>Language Studies</b>                                      | <b>10 cr</b> |                     |
| Finnish 1                                                    | 5 cr k1      | H Pass              |
| Finnish 2                                                    | 5 cr k1      | H Pass              |
| <b>Elective Studies</b>                                      | <b>30 cr</b> |                     |
| Ethical Hacking                                              | 5 cr         | H Pass              |
| Amazon Web Services                                          | 5 cr         | 5 Excellent         |
| Amazon Cloud Foundation                                      | 5 cr         | 5 Excellent         |
| Microsoft Azure Administrator                                | 5 cr         | H Pass              |
| Microsoft Certified: Azure Administrator Associate           | 5 cr         | H Pass              |
| Designing and Implementing Microsoft DevOps Solutions        | 5 cr         | H Pass              |
| <b>Work Placement</b>                                        | <b>30 cr</b> |                     |
| Work Placement 1                                             | 15 cr        | H Pass              |
| Work Placement 2                                             | 15 cr        | H Pass              |
| <b>Bachelor's Thesis</b>                                     | <b>15 cr</b> |                     |
| Planning of the Thesis Work                                  | 5 cr         | 3 Good              |
| Execution of the Thesis Work                                 | 5 cr         | 3 Good              |

|                |                                              |                         |
|----------------|----------------------------------------------|-------------------------|
| Student        | ████████████████████<br>██████████<br>██████ | Graduated 20.01.2025    |
| Programme      | Degree Programme in Information Technology   | Credits <b>240 cr</b>   |
| Specialisation | Professional Major Smart IoT Systems         | Completed <b>245 cr</b> |

| Studies                                   | Credits | Assessment |
|-------------------------------------------|---------|------------|
| Reporting of the Thesis and Maturity Test | 5 cr    | 3 Good     |

| Thesis               | Assessment | Assessment date |
|----------------------|------------|-----------------|
| ████████████████████ | █          | ████████        |

**Compensated studies**

k1 = Finnish language and communication skills, 10.6.2016, Aikuisten maahanmuuttajien kotoutumiskoulutus, Galimatias Concept

The language of the degree programme was English. The graduate has taken the maturity test included in the final year project in English. The graduate has acquired such oral and written English skills that are necessary for practising their profession and for further professional development (Decree 1129/2014, 7 §). The graduate's school education was completed in a language other than Finnish or Swedish, or abroad. Therefore, they were exempted from the requirement of Finnish or Swedish as specified in Decree (1129/2014, 7 § and Act 424/2003, amended by 693/2016, 6 §).

## Tutkintotodistus

Nro [REDACTED]

Tekniikan ja liikenteen ala

[REDACTED]

[REDACTED]

on suorittanut ammattikorkeakouluopinnoista annetun lain (932/2014) mukaisen

tekniikan ammattikorkeakoulututkinnon (240 op)

Degree Programme in Information Technology tutkinto-ohjelmassa

amatillisenä pääaineena älykkäät iot-järjestelmät

Tutkinto oikeuttaa käyttämään opetus- ja kulttuuriministeriön vahvistamaa tutkintonimikettä

Insinööri (AMK)

Suoritetut opinnot arvosanoineen ilmenevät tämän todistuksen liitteestä.

Espoossa 20. tammikuuta 2025



Riitta Konkola  
rehtori

Tämä todistus on allekirjoitettu sähköisesti.

|            |                                                    |                        |        |
|------------|----------------------------------------------------|------------------------|--------|
| Opiskelija |                                                    | Valmistunut 20.01.2025 |        |
| Ohjelma    | Degree Programme in Information Technology         | Laajuus                | 240 op |
| Suunta     | Ammatillisena pääaineena älykkäät IoT-järjestelmät | Suoritettu             | 245 op |

| Opinnot                                                     | Laajuus      | Arviointi             |
|-------------------------------------------------------------|--------------|-----------------------|
| <b>Orientaatio tieto- ja viestintätekniikkaan</b>           | <b>60 op</b> |                       |
| Orientaatio                                                 | 15 op        | 5 Kiitettävä          |
| Mobiililaitteet                                             | 15 op        | 3 Hyvä                |
| Älykkäät laitteet                                           | 15 op        | 4 Erittäin hyvä       |
| Linux ja tietoverkot                                        | 15 op        | 4 Erittäin hyvä       |
| <b>Suuntaavat ammattiopinnot</b>                            | <b>30 op</b> |                       |
| <b>Älykkäiden IoT-järjestelmien perusteet</b>               | <b>30 op</b> |                       |
| IoT-laitteiden C-ohjelmointi                                | 5 op         | 3 Hyvä                |
| Reitityksen, kytkennän ja langattomien verkkojen perusteet  | 5 op         | 5 Kiitettävä          |
| Insinöörimatematiikka                                       | 5 op         | 2 Erittäin tyydyttävä |
| IoT-laitteiden olio-ohjelmointi                             | 5 op         | 3 Hyvä                |
| Yritysverkkojen konfigurointi, tietoturva ja automaatio     | 5 op         | 4 Erittäin hyvä       |
| Todennäköisyys ja tilastomatematiikka                       | 5 op         | 4 Erittäin hyvä       |
| <b>Syventävät ammattiopinnot</b>                            | <b>55 op</b> |                       |
| <b>Älykkäät IoT-järjestelmät</b>                            | <b>55 op</b> |                       |
| IoT-laitteiden liitännät                                    | 5 op         | 2 Erittäin tyydyttävä |
| IoT:n matematiikka ja fysiikka                              | 5 op         | 3 Hyvä                |
| Linux-palvelimet ja tietokannat                             | 5 op         | 4 Erittäin hyvä       |
| IoT-laitteet ja langaton tiedonsiirto                       | 5 op         | 2 Erittäin tyydyttävä |
| Anturifysiikka                                              | 5 op         | 3 Hyvä                |
| <b>IoT ja tietoverkot</b>                                   | <b>30 op</b> |                       |
| Virtualisointi ja pilvipalvelut                             | 5 op         | 5 Kiitettävä          |
| IoT tietoturva                                              | 5 op         | 5 Kiitettävä          |
| Kehittynyt reititys ja kytkentä moderneissa yritysverkoissa | 10 op        | 4 Erittäin hyvä       |
| Tekninen tietoturva                                         | 5 op         | 5 Kiitettävä          |
| Windows-palvelimet                                          | 5 op         | 5 Kiitettävä          |
| <b>Innovaatio-opinnot</b>                                   | <b>15 op</b> |                       |
| Monialainen innovaatioprojekti                              | 10 op        | H Hyväksytty          |
| Menetelmäopinnot                                            | 5 op         | H Hyväksytty          |
| <b>Kieliopinnot</b>                                         | <b>10 op</b> |                       |
| Suomi 1                                                     | 5 op k1      | H Hyväksytty          |
| Suomi 2                                                     | 5 op k1      | H Hyväksytty          |
| <b>Valinnaiset ja vapaasti valittavat opinnot</b>           | <b>30 op</b> |                       |
| Eettinen hakkerointi                                        | 5 op         | H Hyväksytty          |
| Amazon Web Services                                         | 5 op         | 5 Kiitettävä          |
| Amazon-pilvipalvelun perusteet                              | 5 op         | 5 Kiitettävä          |
| Microsoft Azure Administrator                               | 5 op         | H Hyväksytty          |
| Microsoft Certified: Azure Administrator Associate          | 5 op         | H Hyväksytty          |
| Designing and Implementing Microsoft DevOps Solutions       | 5 op         | H Hyväksytty          |
| <b>Harjoittelu</b>                                          | <b>30 op</b> |                       |
| Harjoittelu 1                                               | 15 op        | H Hyväksytty          |
| Harjoittelu 2                                               | 15 op        | H Hyväksytty          |
| <b>Opinnäytetyö</b>                                         | <b>15 op</b> |                       |
| Opinnäytetyön suunnittelu                                   | 5 op         | 3 Hyvä                |
| Opinnäytetyön toteutus                                      | 5 op         | 3 Hyvä                |
| Opinnäytetyön raportointi ja kypsyyinäyte                   | 5 op         | 3 Hyvä                |





|                |                                            |                      |        |
|----------------|--------------------------------------------|----------------------|--------|
| Student        |                                            | Graduated 20.01.2025 |        |
| Programme      | Degree Programme in Information Technology | Credits              | 240 cr |
| Specialisation | Professional Major Smart IoT Systems       | Completed            | 245 cr |

| Studies                                                      | Credits      | Assessment          |
|--------------------------------------------------------------|--------------|---------------------|
| <b>Orientation to Information Technology</b>                 | <b>60 cr</b> |                     |
| Orientation                                                  | 15 cr        | 5 Excellent         |
| Mobiles                                                      | 15 cr        | 3 Good              |
| Smart Devices                                                | 15 cr        | 4 Very good         |
| Linux and Networks                                           | 15 cr        | 4 Very good         |
| <b>Fundamental Professional Studies</b>                      | <b>30 cr</b> |                     |
| <b>Basics of Smart IoT Systems</b>                           | <b>30 cr</b> |                     |
| C Programming in IoT Devices                                 | 5 cr         | 3 Good              |
| Switching, Routing and Wireless Essentials                   | 5 cr         | 5 Excellent         |
| Engineering Mathematics                                      | 5 cr         | 2 Very satisfactory |
| Object-Oriented Programming in IoT Devices                   | 5 cr         | 3 Good              |
| Enterprise Networking, Security and Automation               | 5 cr         | 4 Very good         |
| Probability and Statistics                                   | 5 cr         | 4 Very good         |
| <b>Advanced Professional Studies</b>                         | <b>55 cr</b> |                     |
| <b>Smart IoT Systems</b>                                     | <b>55 cr</b> |                     |
| IoT Connecting Things                                        | 5 cr         | 2 Very satisfactory |
| Mathematics and Physics for IoT                              | 5 cr         | 3 Good              |
| Linux Servers and Databases                                  | 5 cr         | 4 Very good         |
| IoT Devices and Wireless Communication                       | 5 cr         | 2 Very satisfactory |
| Sensor Physics                                               | 5 cr         | 3 Good              |
| <b>IoT and Networks</b>                                      | <b>30 cr</b> |                     |
| Virtualization and Cloud Computing                           | 5 cr         | 5 Excellent         |
| IoT Security                                                 | 5 cr         | 5 Excellent         |
| Advanced Routing and Switching in Modern Enterprise Networks | 10 cr        | 4 Very good         |
| IT Security                                                  | 5 cr         | 5 Excellent         |
| Windows Servers                                              | 5 cr         | 5 Excellent         |
| <b>Innovation Studies</b>                                    | <b>15 cr</b> |                     |
| Multidisciplinary Innovation Project                         | 10 cr        | H Pass              |
| Methodological Studies                                       | 5 cr         | H Pass              |
| <b>Language Studies</b>                                      | <b>10 cr</b> |                     |
| Finnish 1                                                    | 5 cr k1      | H Pass              |
| Finnish 2                                                    | 5 cr k1      | H Pass              |
| <b>Elective Studies</b>                                      | <b>30 cr</b> |                     |
| Ethical Hacking                                              | 5 cr         | H Pass              |
| Amazon Web Services                                          | 5 cr         | 5 Excellent         |
| Amazon Cloud Foundation                                      | 5 cr         | 5 Excellent         |
| Microsoft Azure Administrator                                | 5 cr         | H Pass              |
| Microsoft Certified: Azure Administrator Associate           | 5 cr         | H Pass              |
| Designing and Implementing Microsoft DevOps Solutions        | 5 cr         | H Pass              |
| <b>Work Placement</b>                                        | <b>30 cr</b> |                     |
| Work Placement 1                                             | 15 cr        | H Pass              |
| Work Placement 2                                             | 15 cr        | H Pass              |
| <b>Bachelor's Thesis</b>                                     | <b>15 cr</b> |                     |
| Planning of the Thesis Work                                  | 5 cr         | 3 Good              |
| Execution of the Thesis Work                                 | 5 cr         | 3 Good              |

|                       |                                              |                                |
|-----------------------|----------------------------------------------|--------------------------------|
| <b>Student</b>        | ████████████████████<br>██████████<br>██████ | Graduated 20.01.2025           |
| <b>Programme</b>      | Degree Programme in Information Technology   | <b>Credits</b> <b>240 cr</b>   |
| <b>Specialisation</b> | Professional Major Smart IoT Systems         | <b>Completed</b> <b>245 cr</b> |

|                                           |                |                   |
|-------------------------------------------|----------------|-------------------|
| <b>Studies</b>                            | <b>Credits</b> | <b>Assessment</b> |
| Reporting of the Thesis and Maturity Test | 5 cr           | 3 Good            |

|                      |                   |                        |
|----------------------|-------------------|------------------------|
| <b>Thesis</b>        | <b>Assessment</b> | <b>Assessment date</b> |
| ████████████████████ | █                 | ██████████             |

**Compensated studies**

k1 = Finnish language and communication skills, 10.6.2016, Aikuisten maahanmuuttajien kotoutumiskoulutus, Galimatias Concept

The language of the degree programme was English. The graduate has taken the maturity test included in the final year project in English. The graduate has acquired such oral and written English skills that are necessary for practising their profession and for further professional development (Decree 1129/2014, 7 §). The graduate's school education was completed in a language other than Finnish or Swedish, or abroad. Therefore, they were exempted from the requirement of Finnish or Swedish as specified in Decree (1129/2014, 7 § and Act 424/2003, amended by 693/2016, 6 §).



The purpose of the Diploma Supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications (diplomas, degrees, certificates, etc.) It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It is free from any value judgements, equivalence statements or suggestions about recognition. This Diploma Supplement model was developed by the European Commission, Council of Europe and UNESCO.

## 1 INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION

- |     |                               |                               |
|-----|-------------------------------|-------------------------------|
| 1.1 | Family name(s)                | [REDACTED]                    |
| 1.2 | Given name(s)                 | [REDACTED]                    |
| 1.3 | Date of birth                 | [REDACTED]                    |
| 1.4 | Student identification number | OID: [REDACTED]<br>[REDACTED] |

## 2 INFORMATION IDENTIFYING THE QUALIFICATION

- |     |                                                      |                                                                                                                                             |
|-----|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1 | Name of qualification and title conferred            | Tekniikan ammattikorkeakoulututkinto / Bachelor of Engineering<br><br>Insinööri (AMK), Bachelor of Engineering                              |
| 2.2 | Main field(s) of study for the qualification         | Information and Communication Technologies (ICTs)<br>Degree Programme in Information Technology<br><br>Professional Major Smart IoT Systems |
| 2.3 | Name and status of awarding institution              | Metropolia Ammattikorkeakoulu (Metropolia University of Applied Sciences), state recognised university of applied sciences.                 |
| 2.4 | Name and status of institution administering studies | Not applicable                                                                                                                              |
| 2.5 | Language(s) of instruction/examination               | English                                                                                                                                     |

### 3 INFORMATION ON THE LEVEL OF THE QUALIFICATION

- |     |                                                     |                                                                                                                      |
|-----|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| 3.1 | Level of qualification                              | See 8.<br>First-cycle higher education degree (bachelor level)                                                       |
| 3.2 | Official duration of programme in credits and years | The degree consists of 240 credits (4 years of full time study). Finnish credits are fully compatible with the ECTS. |
| 3.3 | Access requirement(s)                               | See 8.<br>There is numerus clausus, i.e. restricted entry, to all fields of study.                                   |

#### 4 INFORMATION ON THE CONTENTS AND RESULTS GAINED

- |     |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.1 | Mode of study               | Full-time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 4.2 | Programme learning outcomes | <p>See Transcript of Records.</p> <p>Structure of studies leading to a first-cycle university of applied sciences degree:</p> <p>The studies consist of core, professional, elective studies, work placement, Bachelor's Thesis and the maturity test.</p> <p>The general aim of studies leading to a first-cycle university of applied sciences degree is to provide the student with:</p> <ol style="list-style-type: none"> <li>1) extensive practical basic skills and knowledge and theoretical foundations of these to provide proficiency to operate in expert positions in the field</li> <li>2) prerequisites for keeping up with and promoting developments in the field</li> <li>3) a capability for continuous learning</li> <li>4) sufficient communication and language skills</li> </ol> |

5) a capability to engage in international activities within the field.

4.3 Programme details (e.g. modules or units studied, and individual grades/marks/credits obtained) See transcript of records

4.4 Grading scheme and, if available, grade distribution guidance  
5 = Excellent  
4 = Very good  
3 = Good  
2 = Very Satisfactory  
1 = Satisfactory  
H = Pass

4.5 Overall classification of the qualification Not applicable

## 5 INFORMATION ON THE FUNCTION OF THE QUALIFICATION

5.1 Access to further study Eligible for second-cycle higher education studies. The admissions decisions are made in the receiving higher education institution.

5.2 Access to a regulated profession The degree falls under the Article 11 of the Directive 2005/36/EC of the European Parliament and of the Council on the recognition of professional qualifications, level d or e (d= lower university degree, Bachelor's degree, e= Master's degree, licentiate degree, doctoral degree).

## 6 ADDITIONAL INFORMATION

6.1 Additional information Not applicable

6.2 Further information sources  
Metropolia Ammattikorkeakoulu (Metropolia University of Applied Sciences),  
Student and Admission Services  
PL 4000  
FI - 00079 Metropolia  
Tel. +358 9 7424 5000  
Fax +358 9 7424 5005  
www.metropolia.fi  
  
www.minedu.fi, The Ministry of Education and Culture  
www.oph.fi/recognition, www.oph.fi/qualificationsframework  
The Finnish National Agency for Education, the ENIC: European Network of  
Information Centres in the European Region and the NARIC: National  
Academic Recognition Information Centres in the European Union and the  
National Coordination Point for the European Qualifications Framework (EQF)  
www.karvi.fi, The Finnish Education Evaluation Centre

## 7 CERTIFICATION OF THE SUPPLEMENT

7.1 Date 20.01.2025

7.2 Signature The document is electronically signed by the President of Metropolia University of Applied Sciences and the document is only valid in its original electronic form

7.3 Capacity with the accompanying electronic signature.

7.4 Official stamp or seal

## 8 INFORMATION ON THE NATIONAL HIGHER EDUCATION SYSTEM

The description of the higher education system has been prepared by the Finnish National Agency for Education.

The Finnish education system consists of pre-primary and basic education, general and vocational education and higher education. The compulsory schooling consists of one-year pre-primary education for 6-year-olds and nine-year basic education for children aged 7-16.

Post-compulsory education consists of general and vocational upper secondary education that lead to the national Matriculation Examination (ylioppilastutkinto/studentexamen), vocational upper secondary qualification (ammattillinen perustutkinto/yrkesinriktad grundexamen), further vocational qualification (ammattitutkinto, yrkesexamen) and specialist vocational qualification (erikoisammattitutkinto/specialyrkesexamen).

Higher education system in Finland

The Finnish higher education system comprises universities (yliopisto/universitet) and universities of applied sciences (ammattikorkeakoulu, AMK/yrkeshögskola, YH). The universities engage both in education and research and have the right to award doctorates. The universities of applied sciences are multi-field institutions of professional higher education. Universities of applied sciences engage in applied research and development.

First and second cycle higher education studies are measured in credits (opintopiste/studiepoäng). Study courses are quantified according to the work load required. One year of full-time study is equivalent to 1600 hours of student work on average and is defined as 60 credits. The credit system complies with the European Credit Transfer and Accumulation System (ECTS).

Higher education qualifications in Finland are referenced at levels 6, 7 and 8 both in the National Qualifications Framework as well as in the European Qualifications Framework.

#### University degrees

The Government Decree on University Degrees and Specialisation Studies (794/2004 including amendments) defines the objectives, extent and overall structure of degrees. The universities decide on the detailed contents and structure of the degrees they award. They also decide on their curricula and forms of instruction.

#### First-cycle university degree

The first cycle university degree consists of at least 180 credits (three years of full-time study). The degree is called kandidaatti/kandidat in all fields of study except for Law (oikeusnotaari/rättsnotarie) and Pharmacy (farmaseutti/farmaceut). The determined English translation for all of these degrees is Bachelor's degree, the most common degree titles being Bachelor of Arts and Bachelor of Science.

Studies leading to the degree provide the student with: (1) knowledge of the fundamentals of the major and minor subjects or corresponding study entities or studies included in the degree programme and the prerequisites for following developments in the field, (2) knowledge and skills needed for scientific thinking and the use of scientific methods or knowledge and skills needed for artistic work, (3) knowledge and skills needed for studies leading to a higher university degree and for life-long learning, (4) a capacity for applying the acquired knowledge and skills to work and in international co-operation, and (5) adequate language and communication skills for working in one's own field and for international work and co-operation.

Studies leading to the degree may include: basic and intermediate studies; language and communication studies, interdisciplinary programmes, and other studies and work practice for professional development. The degree includes a Bachelor's thesis (6 – 10 credits).

#### The Second-cycle university degree

The second cycle university degree consists of at least 120 credits (two years of full-time study). The degree is usually called maisteri/magister. Other second cycle degree titles are diplomi-insinööriin tutkinto/diplomingenjöröexamen (Technology), proviisorin tutkinto /provisorexamen (Pharmacy), arkkitehdin tutkinto/arkitektexamen (Architecture) and maisema-arkkitehdin tutkinto/ landskapsarkitektexamen (Landscape Architecture). The determined English translation for all these degrees is Master's degree, the most common degree titles being Master of Arts and Master of Science. The second cycle university degree title in the fields of Medicine, Veterinary Medicine and Dentistry is lisensiaatti/licentiat, the English title being Licentiate. The admission requirement for the second cycle university degree is a first cycle degree.

In the fields of Medicine and Dentistry the university may arrange the education leading to the second cycle university degree without including a first cycle university degree in the education. In Medicine, the degree consists of 360 credits (six years of full-time study) and in Dentistry the degree consists of 330 credits (five and a half years of full-time study).

Studies leading to the second cycle university degree provide the student with: (1) good overall knowledge of the major subject or a corresponding entity and conversance with the fundamentals of the minor subject or good knowledge of the advanced studies included in the degree programme; (2) knowledge and skills needed to apply scientific knowledge and scientific methods or knowledge and skills needed for independent and demanding artistic work; (3) knowledge and skills needed for independently operating as an expert and developer of the field and for international co-operation; (4) knowledge and skills needed for scientific or artistic postgraduate education and for life-long learning; and (5) good language and communication skills for working in one's own field and for international work and co-operation.

The studies leading to the second cycle university degree may include: basic and intermediate studies and advanced studies, language and communication studies; interdisciplinary studies, other studies, and internship improving expertise. The degree includes a Master's thesis (20 – 40 credits).

#### Doctoral degrees

The aim of doctoral studies is to provide student with an in-depth knowledge of their field of research and capabilities to produce novel scientific knowledge independently.

The degree of lisensiaatti/licentiat (Licentiate) may be taken before the Doctor's degree and in general it takes two

years of full-time study to complete.

The Doctor's degree takes approximately four years to complete after a second cycle degree and two years when completed after a Licentiate's degree. A student who has been admitted to studies leading to Doctor's degree must complete a given amount of studies, show independent and critical thinking in their field of research and write a Doctor's dissertation and defend it in public.

#### University of applied Sciences degrees

The universities of applied sciences Act (932/2014 including amendments) defines the objectives, extent and overall structure of universities of applied sciences degrees. The universities of applied sciences decide on the detailed contents and structure of the degrees they award. They also decide on their curricula and forms of instruction.

#### First-cycle university of applied sciences degrees

The first cycle university of applied sciences degree consists of 180, 210, 240 or 270 credits (three to four and a half years of full-time study) depending on the field of study. The first cycle university of applied sciences degree is called *ammattikorkeakoulututkinto/yrkeshögskoleexamen*. The determined English translation for the degree is Bachelor's degree. The degree titles indicate the field of study, e.g. Bachelor of Engineering and Bachelor of Health Care.

Studies leading to the degree provide the student with: (1) broad overall knowledge and skills with relevant theoretical background for working as expert of the field, (2) knowledge and skills needed for following and advancing developments in the field, (3) knowledge and skills needed for professional development and life-long learning, and (4) adequate language and communication skills for working in one's own field and for international work and co-operation.

The first-cycle university of applied sciences degree comprises basic and professional studies, elective studies, a practical training period and a final project.

#### The second cycle university of applied sciences degrees

The second cycle university of applied sciences degree consists of 60 or 90 credits (a year or a year and a half of full-time study). The Master of Police Services degree consists of 120 credits. The degree is called *ylempi ammattikorkeakoulututkinto/högre yrkeshögskoleexamen*. The determined English translation for the degree is Master's degree. The degree titles indicate the field of study, e.g. Master of Culture and Arts or Master of Business Administration.

Studies leading to the degree provide the student with: (1) broad and advanced knowledge and skills for developing the professional field as well as the theoretical skills for working in demanding expert and leadership positions in the field, (2) profound understanding of the field, its relation to working life and society at large as well as the knowledge and skills needed for following and analysing both theoretical and professional developments in the field, (3) capacity for life-long learning and continuous development of one's own expertise, and (4) good language and communication skills for working in one's own field and for international work and co-operation.

The second cycle university of applied sciences degree comprises advanced professional studies, elective studies, and a final project.

#### Professional specialisation programmes

Universities and universities of applied sciences offer professional specialisation programmes for those who have completed a degree and have already entered working life. Professional specialisation programmes aim to promote professional development and specialisation by means of providing education based on the research.

Provisions on the joint objectives and minimum scope of professional specialisation programmes are issued by government decree. The minimum scope of professional specialisation studies is 30 credits.