

**Curriculum at LAB University of Applied Sciences  
2019-2020**

**Bachelor of Engineering, Information and Communications  
Technology, part-time studies, online studies, Lahti**

Code	Name	1 y	2 y	3 y	4 y	ECTS total
<b>TETVT19SV-1018 CORE COMPETENCE</b>						<b>195</b>
<b>TETVT19SV-1019 Common Core Competence</b>						<b>15</b>
A300CF90	Orientation to Sustainability Thinking		2			2
AY00BT88	Developing professional competence 1	1				1
AY00BT89	Developing professional competence 2	1				1
AY00BT90	Developing professional competence 3		1			1
KS00BT59	Expert Communication Skills	4				4
KE00BT61	English for Work	4				4
KR00BU42	Swedish for work, spoken		1			1
KR00BU43	Swedish for work, written		1			1
<b>TETVT19SV-1020 Professional Core Competence</b>						<b>180</b>
<b>TETVT19SV-1039 Common Professional Core Competence</b>						<b>75</b>
<b>TETVT19SV-1036 Basic studies in mathematics and physics</b>						<b>15</b>
AT00BT67	Basic studies in mathematics	3				3
AT00BT68	Mathematics in Technology 1	3				3
AT00BT69	Mathematics in Technology 2		3			3
AT00BT70	Basic studies in physics	3				3
AT00BT71	Physics in Information Technologies	3				3
<b>TETVT19SV-1037 Digitalization</b>						<b>15</b>
AT00BT72	Basics of Digitalization	5				5
AT00BT73	STEM of ICT	5				5
AT00BT74	IoT Basics		5			5
<b>TETVT19SV-1038 Basic of ICT</b>						<b>15</b>
AT00BT75	Basics of Programming	5				5
AT00BT76	Basics of WWW design	5				5
AT00BT77	Telecommunications and security basics	5				5
<b>TETVT19SV-1041 ICT and applications</b>						<b>15</b>
AT00BT78	Objects and databases	5				5
AT00BT79	Web and interactivity	3				3
AT00BT80	Server and workstation virtualization	4				4
AT00BT81	Basics of Project work	3				3

<b>TETVT19SV-1042 RDI and entrepreneurship</b>					<b>15</b>
AT00BY44	Research Seminar		5		5
AT00BY45	Entrepreneurship and Innovation		5		5
AT00BY46	Working Skills		5		5
<b>TETVT19SV-1040 Profiling Professional Core Competence</b>					<b>60</b>
<b>TETVT19SV-1043 Web and game technologies</b>					<b>15</b>
AT00BX89	Web and Game technologies basics		5		5
AT00BX90	Web and Game design		5		5
AT00BX91	Application of web and game technologies		5		5
<b>TETVT19SV-1044 IoT and embedded systems</b>					<b>15</b>
AT00BX92	IoT and embedded systems basics		5		5
AT00BY05	IoT and embedded systems design		5		5
AT00BY06	Applications of IoT and embedded systems				0
<b>TETVT19SV-1045 Software engineering</b>					<b>15</b>
AT00BY07	Software engineering and architecture		5		5
AT00BY08	Data structures and algorithms		3		3
AT00BY09	Programming languages		4		4
AT00BY10	Software maintenance and testing		3		3
<b>TETVT19SV-1046 Tele communication</b>					<b>15</b>
AT00BY11	LAN basics and security		5		5
AT00BY12	Network monitoring and redundancy		5		5
AT00BY13	Client-driven data networks		5		5
<b>TETVT19SV-1047 Media technology</b>					<b>15</b>
AT00BY14	Modelling		5		5
AT00BY15	Game design basics		5		5
AT00BY16	Audiovisual technologies		5		5
<b>TETVT19SV-1048 Digital technology</b>					<b>15</b>
AT00BY17	Embedded computers		5		5
AT00BY18	Electronics		5		5
AT00BY19	Digital technologies workshop		5		5
<b>TETVT19SV-1049 Web services</b>					<b>15</b>
AT00BY20	Javascript platforms		4		4
AT00BY21	Server technologies		4		4
AT00BY22	Frameworks		3		3
AT00BY23	Cloud computing		4		4
<b>TETVT19SV-1050 Mobile and game programming</b>					<b>15</b>
AT00BY24	Hybrid mobile programming		5		5
AT00BY25	Native mobile programming		5		5
AT00BY26	Advanced game programming		5		5
<b>TETVT19SV-1051 Visual design</b>					<b>0</b>

AT00BY27	User Interfaces and usability			5		5
AT00BY28	Web game environments			5		5
AT00BY29	Graphics communication			5		5
<b>TETVT19SV-1052 Game technology</b>						<b>15</b>
AT00BY30	Game modelling			5		5
AT00BY26	Advanced game programming			5		5
AT00BY32	New technologies			5		5
<b>TETVT19SV-1053 Data centers and server systems</b>						<b>15</b>
AT00BY33	Virtualization and Cloud services			5		5
AT00BY34	Servers and services			5		5
AT00BY35	Implementation of the service			5		5
<b>TETVT19SV-1054 Embedded programming</b>						<b>15</b>
AT00BY36	Basics of embedded programming				5	5
AT00BY37	Distributed Systems				5	5
AT00BY38	Applications of IoT				5	5
<b>TETVT19SV-1059 IoT systems and solutions</b>						<b>15</b>
AT00BY50	IoT development environments and systems			5		5
AT00BY51	IoT communication systems and monitoring			5		5
AT00BY52	IoT service client project			5		5
<b>TETVT19SV-1055 Embedded devices</b>						<b>15</b>
AT00BY39	IoT devices			5		5
AT00BY40	IoT and data transfer			5		5
AT00BY41	IoT Workshop			5		5
<b>TETVT19SV-1033 Practical Training</b>						<b>30</b>
LA00BO03	Practical Training	1,5	3	3	3	10
LA00BO04	Practical Training 2		2	4	4	10
LA00BO05	Practical Training 3			3,5	6,5	10
<b>TETVT19SV-1034 Thesis</b>						<b>15</b>
LA00BN99	Thesis planning			2,5	2,5	5
LA00BO00	Thesis research and writing				5	5
LA00BO01	Thesis publication				5	5
<b>TETVT19SV-1035 COMPLEMENTARY COMPETENCE</b>						<b>45</b>
<b>TETVT19SV-1062 From data to machine learning</b>						<b>15</b>
AT00BY42	Data analysis and visualization			10		10
AT00BY43	Machine Learning			5		5
<b>TETVT19SV-1065 Web-programming</b>						<b>15</b>
AT00BY20	Javascript platforms				4	4
AT00BY21	Server technologies				4	4
AT00BY53	Providing a web service				7	7

## **TETVT19SV-1018 CORE COMPETENCE: 195 ECTS**

## **TETVT19SV-1019 Common Core Competence: 15 ECTS**

### **A300CF90 Orientation to Sustainability Thinking: 2 ECTS**

#### **Learning outcomes**

Identify and define central concepts and frameworks related to sustainability. Recognize the interconnectedness of economic, social and environmental sustainability issues. Understand and develop own individual role in driving sustainability.

#### **Evaluation criterias**

##### **Level 1**

Pass-Fail

### **AY00BT88 Developing professional competence 1: 1 ECTS**

#### **Learning outcomes**

The student is able to

- plan their own learning and cooperate in situations related to their own field of studies
- recognize their own competence and the needs to develop them further and to plan their career path observing them
- act as a group member
- operate in the learning environments of LAB University of Applied Sciences
- picture their own field of studies and its future skills
- give feedback on tuition and services and thus participate in the development of education

### **AY00BT89 Developing professional competence 2: 1 ECTS**

#### **Learning outcomes**

The student is able to

- utilize various learning opportunities in curriculum
- recognize and aim their own competences to be in level with the future career requirements
- create a study plan that supports the future career goal
- give feedback on tuition and services and thus participate in the development of education

### **AY00BT90 Developing professional competence 3: 1 ECTS**

#### **Learning outcomes**

The student is able to

- identify themselves as a learner and develop their own learning skills
- evaluate innovative or alternative future competences required in their own field
- recognize and aim their own competences to be in level with the future career requirements
- masters the professional concepts of their own field and is able to point out their competencies during job recruitment processes
- give feedback on tuition and services and thus participate in the development of education

## **KS00BT59 Expert Communication Skills: 4 ECTS**

### **Learning outcomes**

Proficiency level: C2

The student masters Finnish language as a mother tongue in all professional spoken and written communication situations.

## **KE00BT61 English for Work: 4 ECTS**

### **Learning outcomes**

The student is able to

- communicate clearly and effectively in different generic and field-specific workplace situations both orally and in writing
- find, evaluate and use information effectively
- function collaboratively in international working environments.

## **KR00BU42 Swedish for work, spoken: 1 ECTS**

### **Learning outcomes**

Proficiency level: B1-B2.1

The student is able to

- convey and validate arguments
- use vital field-specific vocabulary
- communicate essential matters about their education, work experience and tasks
- present their field-specific operational environment
- communicate in various working life situations in Swedish

The student completes the Public Administration Language Test in Swedish.

## **KR00BU43 Swedish for work, written: 1 ECTS**

### **Learning outcomes**

Proficiency level: B1-B2.1

The student is able to

- use vital field-specific vocabulary
- communicate essential matters about their education, work experience and tasks
- understand and produce various short texts related to studies and working life
- acquire information on their field in Swedish
- use online dictionaries

The student completes the Public Administration Language Test in Swedish.

## **TETVT19SV-1020 Professional Core Competence: 180 ECTS**

**TETVT19SV-1039 Common Professional Core Competence: 75 ECTS**

**TETVT19SV-1036 Basic studies in mathematics and physics: 15 ECTS**

**AT00BT67 Basic studies in mathematics: 3 ECTS**

**Learning outcomes**

Student is able to

- calculate and simulate mathematical expressions
- solve geometric and trigonometric problems

**AT00BT68 Mathematics in Technology 1: 3 ECTS**

**Learning outcomes**

Student is able to:

- recognise different polynomial equations and polynomial graph
- solve inequalities
- solve simultaneous equations with the software
- solve basic space vectors
- utilise space vectors
- solve exponential and logarithm functions

**AT00BT69 Mathematics in Technology 2: 3 ECTS**

**Learning outcomes**

Student is able to

- solve challenging functions
- solve basic derivation functions and utilise derivation in practice
- solve integrated polynomial functions and utilise integration in practice
- solve trigonometrical problems

**AT00BT70 Basic studies in physics: 3 ECTS**

**Learning outcomes**

Student is able to

- understand the purpose of the physics in technology
- describe and utilize the SI-unit system and implement
- solve mathematical problems in kinematics, mechanics and thermodynamics
- utilize vectors

**AT00BT71 Physics in Information Technologies: 3 ECTS**

**TETVT19SV-1037 Digitalization: 15 ECTS**

**AT00BT72 Basics of Digitalization: 5 ECTS**

**AT00BT73 STEM of ICT: 5 ECTS**

**AT00BT74 IoT Basics: 5 ECTS**

**TETVT19SV-1038 Basic of ICT: 15 ECTS**

**AT00BT75 Basics of Programming: 5 ECTS**

**AT00BT76 Basics of WWW design: 5 ECTS**

**AT00BT77 Telecommunications and security basics: 5 ECTS**

**TETVT19SV-1041 ICT and applications: 15 ECTS**

**AT00BT78 Objects and databases: 5 ECTS**

**AT00BT79 Web and interactivity: 3 ECTS**

**AT00BT80 Server and workstation virtualization: 4 ECTS**

**AT00BT81 Basics of Project work: 3 ECTS**

**TETVT19SV-1042 RDI and entrepreneurship: 15 ECTS**

**AT00BY44 Research Seminar: 5 ECTS**

**AT00BY45 Entrepreneurship and Innovation: 5 ECTS**

**AT00BY46 Working Skills: 5 ECTS**

**TETVT19SV-1040 Profiling Professional Core Competence: 60 ECTS**

**TETVT19SV-1043 Web and game technologies: 15 ECTS**

**AT00BX89 Web and Game technologies basics: 5 ECTS**

**AT00BX90 Web and Game design: 5 ECTS**

**AT00BX91 Application of web and game technologies: 5 ECTS**

**TETVT19SV-1044 IoT and embedded systems: 15 ECTS**

**AT00BX92 IoT and embedded systems basics: 5 ECTS**

**AT00BY05 IoT and embedded systems design: 5 ECTS**

**AT00BY06 Applications of IoT and embedded systems: 5 ECTS**

**TETVT19SV-1045 Software engineering: 15 ECTS**

**AT00BY07 Software engineering and architecture: 5 ECTS**

**AT00BY08 Data structures and algorithms: 3 ECTS**

**AT00BY09 Programming languages: 4 ECTS**

**AT00BY10 Software maintenance and testing: 3 ECTS**

**TETVT19SV-1046 Tele communication: 15 ECTS**

**AT00BY11 LAN basics and security: 5 ECTS**

**AT00BY12 Network monitoring and redundancy: 5 ECTS**

**AT00BY13 Client-driven data networks: 5 ECTS**

**TETVT19SV-1047 Media technology: 15 ECTS**

**AT00BY14 Modelling: 5 ECTS**

**AT00BY15 Game design basics: 5 ECTS**

**AT00BY16 Audiovisual technologies: 5 ECTS**

**TETVT19SV-1048 Digital technology: 15 ECTS**

**AT00BY17 Embedded computers: 5 ECTS**

**AT00BY18 Electronics: 5 ECTS**



**AT00BY19 Digital technologies workshop: 5 ECTS**

**TETVT19SV-1049 Web services: 15 ECTS**

**AT00BY20 Javascript platforms: 4 ECTS**

**AT00BY21 Server technologies: 4 ECTS**

**AT00BY22 Frameworks: 3 ECTS**

**AT00BY23 Cloud computing: 4 ECTS**

**TETVT19SV-1050 Mobile and game programming: 15 ECTS**

**AT00BY24 Hybrid mobile programming: 5 ECTS**

**AT00BY25 Native mobile programming: 5 ECTS**

**AT00BY26 Advanced game programming: 5 ECTS**

**TETVT19SV-1051 Visual design: 0 ECTS**

**AT00BY27 User Interfaces and usability: 5 ECTS**

**AT00BY28 Web game environments: 5 ECTS**

**AT00BY29 Graphics communication: 5 ECTS**

**TETVT19SV-1052 Game technology: 15 ECTS**

**AT00BY30 Game modelling: 5 ECTS**

**AT00BY26 Advanced game programming: 5 ECTS**

**AT00BY32 New technologies: 5 ECTS**

**TETVT19SV-1053 Data centers and server systems: 15 ECTS**

**AT00BY33 Virtualization and Cloud services: 5 ECTS**

**AT00BY34 Servers and services: 5 ECTS**

**AT00BY35 Implementation of the service: 5 ECTS**

**TETVT19SV-1054 Embedded programming: 15 ECTS**

**AT00BY36 Basics of embedded programming: 5 ECTS**

**AT00BY37 Distributed Systems: 5 ECTS**

**AT00BY38 Applications of IoT: 5 ECTS**

**TETVT19SV-1059 IoT systems and solutions: 15 ECTS**

**AT00BY50 IoT development environments and systems: 5 ECTS**

**AT00BY51 IoT communication systems and monitoring: 5 ECTS**

**AT00BY52 IoT service client project: 5 ECTS**

**TETVT19SV-1055 Embedded devices: 15 ECTS**

**AT00BY39 IoT devices: 5 ECTS**

**AT00BY40 IoT and data transfer: 5 ECTS**

**AT00BY41 IoT Workshop: 5 ECTS**

**TETVT19SV-1033 Practical Training: 30 ECTS**

**LA00BO03 Practical Training: 10 ECTS**

**Learning outcomes**

The student is able to

- describe work-related phenomena and use related concepts
- act in a productive way, following the practices of the workplace and the ethical principles of the profession
- use the techniques, work methods, models and processes that they have learnt
- act in a customer-oriented way in interactive situations in the workplace and in the cooperation network
- evaluate and develop their own competence in the work done in practical training

## **LA00BO04 Practical Training 2: 10 ECTS**

### **Learning outcomes**

The student is able to

- describe work-related phenomena and use related concepts
- act in a productive way, following the practices of the workplace and the ethical principles of the profession
- use the techniques, work methods, models and processes that they have learnt
- act in a customer-oriented way in interactive situations in the workplace and in the cooperation network
- evaluate and develop their own competence in the work done in practical training

## **LA00BO05 Practical Training 3: 10 ECTS**

### **Learning outcomes**

The student is able to

- describe work-related phenomena and use related concepts
- act in a productive way, following the practices of the workplace and the ethical principles of the profession
- use the techniques, work methods, models and processes that they have learnt
- act in a customer-oriented way in interactive situations in the workplace and in the cooperation network
- evaluate and develop their own competence in the work done in practical training

## **TETVT19SV-1034 Thesis: 15 ECTS**

## **LA00BN99 Thesis planning: 5 ECTS**

### **Learning outcomes**

The student is able to

- apply the acquired theoretical knowledge to the problems and phenomena of the working life
- solve problems, organise and perceive wholes
- work interactively, tenaciously and systematically
- work according to the practices of their own line of trade
- gather information and evaluate sources critically - report their work orally, in writing and visually

## **LA00BO00 Thesis research and writing: 5 ECTS**

### **Learning outcomes**

The student is able to

- apply the acquired theoretical knowledge to the problems and phenomena of the working life
- solve problems, organise and perceive wholes
- work interactively, tenaciously and systematically
- work according to the practices of their own line of trade
- gather information and evaluate sources critically - report their work orally, in writing and visually

## **LA00BO01 Thesis publication: 5 ECTS**

**Learning outcomes**

The student is able to

- apply the acquired theoretical knowledge to the problems and phenomena of the working life
- solve problems, organise and perceive wholes
- work interactively, tenaciously and systematically
- work according to the practices of their own line of trade
- gather information and evaluate sources critically - report their work orally, in writing and visually

**TETVT19SV-1035 COMPLEMENTARY COMPETENCE: 45 ECTS**

**TETVT19SV-1062 From data to machine learning: 15 ECTS**

**AT00BY42 Data analysis and visualization: 10 ECTS**

**AT00BY43 Machine Learning: 5 ECTS**

**TETVT19SV-1065 Web-programming: 15 ECTS**

**AT00BY20 Javascript platforms: 4 ECTS**

**AT00BY21 Server technologies: 4 ECTS**

**AT00BY53 Providing a web service: 7 ECTS**