

**Curriculum at LAB University of Applied Sciences
2020-2021**

**Bachelor of Engineering, Information and Communications
Technology, Lahti**

Code	Name	1 y	2 y	3 y	4 y	ECTS total
TETVT20K-1019 CORE COMPETENCE						195
TETVT20K-1020 Common Core Competence						15
AY00BT88	Developing professional competence 1	1				1
AY00BT89	Developing professional competence 2	1				1
AY00BT90	Developing professional competence 3		1			1
A300CF90	Orientation to Sustainability Thinking		2			2
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
TETVT20K-1021 Professional Core Competence						180
TETVT20K-1022 Common Professional Core Competence						75
TETVT20K-1023 Basic studies in mathematics and physics						15
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
TETVT20K-1024 Digitalization						15
AT00BT72	Basics of Digitalization	5				5
AT00BT73	STEM of ICT	5				5
AT00BT74	IoT Basics		5			5
TETVT20K-1025 Basic of ICT						15
AT00BT75	Basics of Programming	5				5
AT00BT76	Basics of WWW design	5				5
AT00BT77	Telecommunications and security basics	5				5
TETVT20K-1026 ICT and applications						15
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

TETVT20K-1027 RDI and entrepreneurship				15	
AT00BY44	Research Seminar		5		5
AT00BY45	Entrepreneurship and Innovation		5		5
AT00BY46	Working Skills		5		5
TETVT20K-1028 Profiling Professional Core Competence				60	
TETVT20K-1057 Web and game technologies				15	
AT00BX89	Web and Game technologies basics		5		5
AT00BX90	Web and Game design		5		5
AT00BX91	Application of web and game technologies		5		5
TETVT20K-1058 IoT and embedded systems				15	
AT00BX92	IoT and embedded systems basics		5		5
AT00BY05	IoT and embedded systems design		5		5
AT00BY06	Applications of IoT and embedded systems		5		5
TETVT20K-1059 Software engineering				15	
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
TETVT20K-1060 Tele communication				15	
AT00BY11	LAN basics and security		5		5
AT00BY12	Network monitoring and redundancy		5		5
AT00BY13	Client-driven data networks		5		5
TETVT20K-1061 Media technology				15	
AT00BY14	Modelling		5		5
AT00BY15	Game design basics		5		5
AT00BY16	Audiovisual technologies		5		5
TETVT20K-1062 Digital technology				15	
AT00BY17	Embedded computers		5		5
AT00BY18	Electronics		5		5
AT00BY19	Digital technologies workshop		5		5
TETVT20K-1063 Web services				15	
AT00BY20	Javascript platforms		4		4
AT00BY21	Server technologies		4		4
AT00BY22	Frameworks		3		3
AT00BY23	Cloud computing		4		4
TETVT20K-1064 Mobile and game programming				15	
AT00BY24	Hybrid mobile programming		5		5
AT00BY25	Native mobile programming		5		5
AT00BY26	Advanced game programming		5		5
TETVT20K-1065 Visual design				15	

AT00BY27	User Interfaces and usability			5		5
AT00BY28	Web game environments			5		5
AT00BY29	Graphics communication			5		5
TETVT20K-1066 Game technology						15
AT00BY30	Game modelling			5		5
AT00BY26	Advanced game programming			5		5
AT00BY32	New technologies			5		5
TETVT20K-1067 Data centers and server systems						15
AT00BY33	Virtualization and Cloud services			5		5
AT00BY34	Servers and services			5		5
AT00BY35	Implementation of the service			5		5
TETVT20K-1068 Embedded programming						15
AT00BY36	Basics of embedded programming			5		5
AT00BY37	Distributed Systems			5		5
AT00BY38	Applications of IoT			5		5
TETVT20K-1069 IoT systems and solutions						15
AT00BY50	IoT development environments and systems			5		5
AT00BY51	IoT communication systems and monitoring			5		5
AT00BY52	IoT service client project			5		5
TETVT20K-1070 Embedded devices						15
AT00BY39	IoT devices			5		5
AT00BY40	IoT and data transfer			5		5
AT00BY41	IoT Workshop			5		5
TETVT20K-1029 Practical Training						30
HA00BU59	Practical Training 1	1,5	3	3	3	10
HA00BU60	Practical Training 2		2	4	4	10
HA00BU61	Practical Training 3			3,5	6,5	10
TETVT20K-1030 Thesis						15
AO00BU62	Thesis planning			2,5	2,5	5
AO00BU63	Thesis project				5	5
AO00BU64	Thesis report				5	5
TETVT20K-1056 COMPLEMENTARY COMPETENCE						45
TETVT20K-1076 From data to machine learning						15
AT00BY42	Data analysis and visualization			10		10
AT00BY43	Machine Learning			5		5
TETVT20K-1078 Web-programming						15
AT00BY20	Javascript platforms			4		4
AT00BY21	Server technologies			4		4
AT00BY53	Providing a web service			7		7

TETVT20K-1019 CORE COMPETENCE: 195 ECTS

TETVT20K-1020 Common Core Competence: 15 ECTS

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

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

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.

TETVT20K-1021 Professional Core Competence: 180 ECTS

TETVT20K-1022 Common Professional Core Competence: 75 ECTS

TETVT20K-1023 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

TETVT20K-1024 Digitalization: 15 ECTS

AT00BT72 Basics of Digitalization: 5 ECTS

AT00BT73 STEM of ICT: 5 ECTS

AT00BT74 IoT Basics: 5 ECTS

TETVT20K-1025 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

TETVT20K-1026 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

TETVT20K-1027 RDI and entrepreneurship: 15 ECTS

AT00BY44 Research Seminar: 5 ECTS

AT00BY45 Entrepreneurship and Innovation: 5 ECTS

AT00BY46 Working Skills: 5 ECTS

TETVT20K-1028 Profiling Professional Core Competence: 60 ECTS

TETVT20K-1057 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

TETVT20K-1058 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

TETVT20K-1059 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

TETVT20K-1060 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

TETVT20K-1061 Media technology: 15 ECTS

AT00BY14 Modelling: 5 ECTS

AT00BY15 Game design basics: 5 ECTS

AT00BY16 Audiovisual technologies: 5 ECTS

TETVT20K-1062 Digital technology: 15 ECTS

AT00BY17 Embedded computers: 5 ECTS

AT00BY18 Electronics: 5 ECTS

AT00BY19 Digital technologies workshop: 5 ECTS

TETVT20K-1063 Web services: 15 ECTS

AT00BY20 Javascript platforms: 4 ECTS

AT00BY21 Server technologies: 4 ECTS

AT00BY22 Frameworks: 3 ECTS

AT00BY23 Cloud computing: 4 ECTS

TETVT20K-1064 Mobile and game programming: 15 ECTS

AT00BY24 Hybrid mobile programming: 5 ECTS

AT00BY25 Native mobile programming: 5 ECTS

AT00BY26 Advanced game programming: 5 ECTS

TETVT20K-1065 Visual design: 15 ECTS

AT00BY27 User Interfaces and usability: 5 ECTS

AT00BY28 Web game environments: 5 ECTS

AT00BY29 Graphics communication: 5 ECTS

TETVT20K-1066 Game technology: 15 ECTS

AT00BY30 Game modelling: 5 ECTS

AT00BY26 Advanced game programming: 5 ECTS

AT00BY32 New technologies: 5 ECTS

TETVT20K-1067 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

TETVT20K-1068 Embedded programming: 15 ECTS

AT00BY36 Basics of embedded programming: 5 ECTS

AT00BY37 Distributed Systems: 5 ECTS

AT00BY38 Applications of IoT: 5 ECTS

TETVT20K-1069 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

TETVT20K-1070 Embedded devices: 15 ECTS

AT00BY39 IoT devices: 5 ECTS

AT00BY40 IoT and data transfer: 5 ECTS

AT00BY41 IoT Workshop: 5 ECTS

TETVT20K-1029 Practical Training: 30 ECTS

HA00BU59 Practical Training 1: 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

HA00BU60 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 into the work done in practical training

HA00BU61 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 into the work done in practical training

TETVT20K-1030 Thesis: 15 ECTS

AO00BU62 Thesis planning: 5 ECTS

AO00BU63 Thesis project: 5 ECTS

AO00BU64 Thesis report: 5 ECTS

TETVT20K-1056 COMPLEMENTARY COMPETENCE: 45 ECTS

TETVT20K-1076 From data to machine learning: 15 ECTS

AT00BY42 Data analysis and visualization: 10 ECTS

AT00BY43 Machine Learning: 5 ECTS

TETVT20K-1078 Web-programming: 15 ECTS

AT00BY20 Javascript platforms: 4 ECTS

AT00BY21 Server technologies: 4 ECTS

AT00BY53 Providing a web service: 7 ECTS