

## Curriculum at LAB University of Applied Sciences 2023-2024

### Master of Engineering, from IoT to AI 23S, online studies

Code	Name	1 y	2 y	ECTS total
<b>TLTIYITT23SV-1001 Core competence</b>				<b>20</b>
TE00BR03	IoT	5		5
YY00CB89	Data Analyzation and Visualization	5		5
YY00CC67	Machine Learning	5		5
YT00CF50	Introduction to artificial intelligence	5		5
<b>TLTIYITT23SV-1002 Complementary competence</b>				<b>10</b>
YT00CF51	Virtualization and servers as data pipeline tools	5		5
YT00CV18	Digital Twins as a part of data pipeline	5		5
<b>TLTIYITT23SV-1003 Thesis</b>				<b>30</b>
YO00BU70	Thesis Planning	10		10
YO00BU71	Thesis Project and Reporting	20		20

#### TLTIYITT23SV-1001 Core competence: 20 ECTS

##### TE00BR03 IoT: 5 ECTS

###### Learning outcomes

The student is able to

- understand the contribution of IoT to the significant increase in the amount of data, understand the nature of sensor data and know the basic principles of data processing at the sensor level
- understand the basic structure of IoT devices
- store measurement results in a database and understand the usability of time series databases
- transfer the measurement results to the cloud service using the standard IoT protocol
- describe the structures of different IoT network architectures and their integration into larger information systems
- take into account the specific security risks of IoT technologies

##### YY00CB89 Data Analyzation and Visualization: 5 ECTS

###### Learning outcomes

The student is able to

- examine the properties of the data in terms of further processing
- utilize mathematical methods in data analysis
- utilize a modern statistical tool
- visualize data and analysis in a way that utilizes further processing
- produce a reproducible research

## **YY00CC67 Machine Learning: 5 ECTS**

### **Learning outcomes**

The student is able to

- take advantage of both supervised and unsupervised machine learning in a functional way
- implement the training of the machine learning model
- utilize data-driven decision making
- compare hardware, software and development environments with different applications utilizing machine learning

## **YT00CF50 Introduction to artificial intelligence: 5 ECTS**

### **Learning outcomes**

The student is able to

- identify the key features of neural networks and deep learning
- study hyperparameters, activation functions, and neural network topology
- handle hidden layers as well as predict using existing data
- take into account usage of resources and the ethical aspects of artificial intelligence

## **TLTIYITT23SV-1002 Complementary competence: 10 ECTS**

## **YT00CF51 Virtualization and servers as data pipeline tools: 5 ECTS**

### **Learning outcomes**

The student knows

- the basics of using the command line in the development and production environment of digital services
- how to compare and leverage virtualization as part of resource-efficient design and implementation of digital services
- how to design and implement a digital service using virtualization and cloud services on a selected platform
- how to discuss and justify the choice of virtualization and cloud services as a platform for digital services.

## **YT00CV18 Digital Twins as a part of data pipeline: 5 ECTS**

### **Learning outcomes**

Student is able to

- identify digital twin operation principles and application areas
- identify game-like activities and possibilities in the digital twin operational environment
- identify game engine possibilities in the digital twins' presentation layer
- implement simple digital twin using modern game engine

## **TLTIYITT23SV-1003 Thesis: 30 ECTS**

**YO00BU70 Thesis Planning: 10 ECTS****Learning outcomes**

The student is able to

- describe the objectives and core contents of their thesis
- plan and describe the stages of the thesis process
- take into account the possible research permit and copyright issues.

**YO00BU71 Thesis Project and Reporting: 20 ECTS****Learning outcomes**

The student is able to

- implement the thesis on the basis of an approved thesis plan
- present the results or output of their thesis
- report on their thesis in writing in accordance with the thesis guidelines of LAB University of Applied Sciences
- as a maturity test, write a blog post, a press release or an article.