

## **DESCRIPTIONS OF ELECTIVE COURSES**

Field of study	Computer Science
Level	first-cycle studies
Students admitted in the academic year	2024/2025
Semester in which the courses are selected	<b>4</b>
Semester in which the courses are conducted	<b>5</b>

Elective courses enable the acquisition of knowledge and development of skills important to the field of study but considering the student's individual interests.

This semester you can choose some elective courses, and the selected courses will be taken in the summer semester.

The course can be implemented if there is enough willing students (no less than 66% of students making their choice).

This semester, you will make your choice using a survey that will be available from April 20th (the survey will be active for one week). Students who do not make a choice will be administratively added to the courses that will be implemented.

**In the summer semester of the 2025/26 academic year, students choose 2 courses out of 4 offered.**

### **LAN AND WLAN OPERATION**

Learning content:

- Ethernet switch configuration. Security basics
- Router configuration basics and security settings
- Creating VLANs
- Routing between VLANs
- Troubleshooting routing problems
- Link aggregation technologies
- DHCPv4 and DHCPv6 configuration. Troubleshooting
- WLAN configuration

### **INTERNET OF THINGS**

Learning content:

- The Internet of Things in today's world. Sensors, actuators, and microcontrollers.
- Building models of IoT systems. Connecting things to the network. Cloud computing
- Industrial IoT applications. IoT systems in the real world. Creating solutions for IoT.
- Control circuit diagrams and their design. Building a simple circuit using an Arduino controller.
- Using Python language in IoT systems. Developing and modifying a circuit: photoresistor, flex sensor, servo.

- Configuring Raspberry Pi. Planning smart IoT systems using web services APIs.
- Designing IoT solutions

## **GAME ENGINES AND PROGRAMMING TECHNOLOGIES**

Learning content:

- Learning about the operating environment of the selected graphics engine
- Development of a game concept
- Creating assets for the engine, using the asset store
- Stage construction
- Script programming
- Techniques for creating animations in a game engine
- Collision detection
- Use of the physical engine
- Testing the game

## **CASE TOOLS METHODOLOGY**

Learning content:

- Introduction to visual modeling. Model management basics. Preparing the project structure with CASE Tool.
- Preparing inception deck for software project. Elevator pitch, product box, not-in list and project glossary.
- Business modeling with CASE Tools. Modeling business aspects with standard UML notation - UML Business Modeling Profile.
- Business modeling with CASE Tools. Business modeling with BPMN notation.
- Domain modeling with UML. Identifying business objects, finding and modeling relationships between objects.
- Requirements modeling. Business, stakeholders and solution requirements. Defining relationships between requirements
- Requirements modeling with use cases - part 1. Dividing system into subsystems. Developing simple use case diagrams.
- Requirements modeling with use cases - part 2. Extending use case diagrams with include and extend relationships.
- Requirements modeling with use cases - part 3. Developing use case scenarios. Happy day scenarios and alternative scenarios. Adding triggers, pre- and post conditions. Specifying additional requirements.
- Agile requirements modeling. Using user stories in requirement specification
- System architecture modeling with CASE Tools
- Preparing data model. Modeling ERD diagrams with CASE Tools. SQL (DDL) scripts generation.
- Model based code generation with CASE Tools.
- Managing software projects with CASE Tools.