VIDZEMES
AUGSTSKOLA

FACULTY OF ENGINEERING
STUDY COURSE DESCRIPTION

Course Title:	**Internet of Things (IoT) and sensor networks**
Course code (LAIS):	*The course will be registered in the study administration system after accreditation*
Study programme:	**Information technologies**
Level of Study programme:	☒ 1st level professional higher education ☒ Professional Bachelor ☐ Professional Master ☐ Academic Master ☐ PhD level
Type of Study programme:	☒ Compulsory course (Part A) ☐ Professional specialization courses (Part B, compulsory) ☐ Professional specialization optional courses (Part B, optional) ☐ Elective courses (Part C)

Course Workload:	**Credits**	**ECTS**	**Academic hours**	**Contact hours**	**Independent work hours**
	2	3	80	32	48

Course Author/ Tutor:	**Razvan Bogdan** Guest lecturer, assoc.prof. e-mail: razvan.bogdan@va.lv Consultation: according to the schedule for each semester
Study Form:	Full time studies
Study year, semester:	2nd year, 3rd semester
Language:	English
Prerequisites for the Course:	Programming Languages, Digital Logic
Course Summary:	This course aims at offering the necessary knowledge regarding the designing and implementation of IoT devices
Assessment:	Exam
Requirements for Credits:	1.Successful completion of Lab work assignments 2. Passed theoretical tests. 3. Successful completion of project work assignment
Abiding by the Academic Ethics	Students must abide by the academic and research ethics, Vidzeme University of Applied Sciences Ethics Regulations, incl.: – study papers must be independently developed; – the study work should reference all statements, ideas and data used that have been authored by someone else; – appropriate data acquisition methods should be used in the acquisition of data, the research ethics must be respected, empirical data must be collected independently and cannot be distorted or falsified; – the examination must be carried out by the student independently, without the use of supporting materials and/or consultations with other students, unless the lecturer states otherwise. In the event of non-compliance with the academic and research ethics, punishment is imposed in accordance with the ViA Ethics Regulations and the study course must be re-taken, unless the punishment is exmatriculation.

Learning Outcomes; the evaluation methods and criteria	**Learning Outcomes**	**The evaluation methods and criteria**
	Knowledge	
	Components of IoT applications	Discussion and Moodle test
	IoT architectures	Discussion and Essay
	Designing, managing the life cycle, integrating and managing the integrity of hardware, software and communication systems in IoT applications	Team (2 students) project

Typical problems that arise in the design of IoT systems	Practical work
Skills	
Developing system architecture for IoT applications	Team practical work
Programming boards for IoT applications	Practical hands-on lab
Configuring and integrating mobile apps used in IoT applications	Practical hands-on lab
Competency	
Knowing the definition and characteristics of an IoT system	Discussion and Essay
Knowing the structure and functioning of an IoT system	Discussion and team project (2 students)
Knowing the programming intricacies of IoT systems	Practical hands-on lab

Course Compulsory literature:	Introduction to the Internet of Things, Textbook, issued by Erasmus+ Program of the European Union An Introduction to Internet of Things : Connecting Devices, Edge Gateway, and Cloud with Applications, Rahul Dubey
Course additional literature:	
Course confirmation date:	08.12.2022
Date of course description update:	

Study Course Plan:

Date	Theme	Academic hours		Study Form/ Organization of independent work of students and task description
		Contact hours	Independent work hours	
The date is specified before the implementation of the course				
Lecture 1	What is IoT; components of IoT product	**3**	**3**	Lecture. Tests
Lecture 2	Applications of IoT; business model canvas (Lean canvas); IoT in Mechatronics	**3**	**3**	Lecture. Practical work. Tests
Lecture 3	Architecture of IoT; edge computing	**2**	**2**	Lecture. Several topics covering practical work .Tests
Lecture 4	IoT technologies, sensors	**3**	**3**	Lecture. Presentations. Tests
Lecture 5	Electronics for the IoT	**1**	**1**	Lecture
Lecture 6	IoT technologies. Arduino.	**12**	**18**	Lecture. Lab work
Lacture 7	IoT Technologies. Raspberry PI, NodeMCU	**3**	**3**	Lecture. Several topics covering practical work
Lecture 8	IoT Communication technologies. Controlling devices over the internet. Introduction to Blynk app	**3**	**3**	Lecture. Several topics covering practical work. Tests
Lecture 9	ThingSpeak Tutorial; IoT project example; SmartPlant	**2**	**2**	Lecture
	Exam		**9**	
	Hours total:	**32**	**48**	