



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Internet of Things, services and applications [S2TIIZM1E>IRUiZ]

Course

Field of study

Information Technology for Smart and Sustainable Mobility

Year/Semester

2/4

Area of study (specialization)

–

Profile of study

general academic

Level of study

second-cycle

Course offered in

English

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

32

Laboratory classes

16

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

3,00

Coordinators

Lecturers

Prerequisites

Knowledge: Fundamentals of telecommunications and radio communication principles. Skills: Basic programming or scripting (e.g., Python, C/C++, or network simulation tools) Problem-solving and systems thinking

Course objective

To provide the key concepts in terms of network planning and interoperability for service provision in the Internet context.

Course-related learning outcomes

Knowledge:

The student has advanced, detailed knowledge of selected issues related to the application of IT tools in transport systems, in particular understands the principles of radio communication, selected standardization activities, service technologies, and the concept of the Internet of Things.

The student has knowledge of development trends and the most significant recent achievements in the field of transport and IT systems, especially those related to the use of ICT technologies in transport.

Skills:

The student is able to use analytical, simulation, and experimental methods to formulate and solve engineering tasks and basic research problems

The student is able - when formulating and solving engineering tasks - to integrate knowledge from various areas of transport and computer science, and to apply a systems approach that also takes non-technical aspects into account

The student is able to assess the suitability of methods and tools used to solve an engineering task involving the construction or evaluation of an IT system or its components, including recognizing the limitations of these methods and tools

Social competences:

The student is prepared to critically assess their knowledge and understands that in transport engineering and computer science, knowledge and skills quickly become outdated

The student understands the importance of using the latest knowledge in transport engineering to solve research and practical problems

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written exam

Practical work

Programme content

Principles of radio communications. Standardization activity. Services technologies. Internet of Things concept. Internet of Things supporting mobility.

Course topics

- Principles of radio communications
- Cellular networks and the path towards 6G
- Some standardization activity: IEEE 802.15.4, LoRaWAN, NBIoT
- Services technologies: Access (HTTP, MQTT, etc.) and federation, etc.
- IoT supporting mobility
 - o Vehicular Communications (V2V, V2X)
 - o Cooperative Intelligent Transport Systems
 - o Autonomous Mobility
 - o Mobility as-a-Service

Teaching methods

The course is conducted remotely (online) in a synchronous format. Classes may also be held in person.

Bibliography

Basic:

Architecting the Internet of Things, Editors: Dieter Uckelmann, Mark Harrison, Florian Michahelles · Publisher: Springer Berlin, Heidelberg 2011, · eBook

Additional:

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Breakdown of average student's workload

	Hours	ECTS
Total workload	78	3,00
Classes requiring direct contact with the teacher	48	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00