SYLLABUS

Name: *Software Development Methodologies (InfAAu-IOT>SM2SDM19)*
Name in Polish:
Name in English: *Software Development Methodologies*

Information on course:
Course offered by department: Faculty of Automatic Control, Electronics and Computer Science
Course for department: Silesian University of Technology

Default type of course examination report:

ZAL

Language:

English

Course homepage:

https://platforma2.polsl.pl/rau2/course/view.php?id=1007

Short description:

The objective of the course is to deliver to the students latest and up to date knowledge on modern software development methodologies within Internet of Things world, including Cloud Computing, artificial intelligence, machine learning, and visualization. The theoretical and practical approach with various hardware platforms, programming languages and integrated development environments will be presented.

Description:

ECTS: 1
Total workload: 30 hours (30 contact hours)
Forms of contact hours:
Lecture 15h
Project 15h
Students' own work: reading literature or multimedia materials, developing a solution or performing practical exercises, preparation for tests, preparation of reports, preparation for classes, elaboration of measurement results

Lectures and projects can be provided by international teachers, visiting professors, and within a block system.

Projects will be focused on one of the following areas:
1) Presentation of modern integrated development environments: Visual Studio Code, PlatformIO, ESP-IDF, TI Code Composer Studio.
2) Presentation of modern Cloud Computing platforms or data analysis tools.
3) Software development methodologies: Spring, Agile

Bibliography:

[1] A. Kapitonov, D. Dobriborsci, I. Pantiukhin, V. Chernov, R. Sell, R. Puks, M. Kingsepp, A. Nikitenko, K. Berkolds, A. Vagale, R. Rumba, Piotr Czekalski, Krzysztof Tokarz, Oleg Antemijczuk, Jarosław Paduch, R. Sell, S. Distefano, R. Dautov, R. Di Pietro, A. Longo Minnolo. „Introduction to the IoT", 2019, http://iot-open.eu/download/io1-introduction-to-the-iot/
[2] "ITU Internet Reports 2005: The Internet of Things." http://www.itu.int/osg/spu/publications/internetofthings/
[3] "Special Report: The Internet of Things", in "the institute", IEEE 2014, http://theinstitute.ieee.org/static/special-report-the-internet-of-things
[4] "Towards a definition of the Internet of Things (IoT)", IEEE 2015
[5] Standard for an Architectural Framework for the Internet of Things (IoT) http://grouper.ieee.org/groups/2413/
[6] Ovidiu Vermesan, Peter Friess (eds.): Digitizing the Industry, Internet of Things Connecting the Physical, Digital and Virtual Worlds, River Publishers Series in Communications, 2016
[7] Vision and Challenges for Realising the Internet of Things, CERP-IoT 2010, http://www.internet-of-things-research.eu/pdf/IoT_Clusterbook_March_2010.pdf
[8] Salim Elbouanani, My Ahmed El Kiram, Omar Achbarou: "Introduction To The Internet Of Things Security. Standardization and research challenges", 2015 11th International Conference on Information Assurance and Security (IAS), IEEE 2015
[9] Video and reading materials available at distance learning platform: course IOTOPEN2x: IoT Networking and Fog Layer Devices
[10] Video and reading materials available at distance learning platform: course IOTOPEN3x: Data Management, Data Security and Robot Operating System as a Common Tool for IoT
[11] Mike Geig: "Sams Teach Yourself Unity 2018 Game Development in 24 Hours", Pearson Education, 2018
[12] Jeremy Gibson Bond: "Introduction to Game Design, Prototyping, and Development", Addison-Wesley Professional; 2 edition, 2017

Learning outcomes:

Knowledge: a student knows and understands
tools, approaches and environments for developing software, data analysis models and data structures (test or oral talk) - K2A_W07

the role of GPU acceleration in computational sciences and data analysis with AI/ML (test or oral talk) - K2A_W14

Skills: a student can
select appropriate technology and programming environment for specific problems (project report) - K2A_U11

review the existing methods and algorithms in terms of meeting particular business goals and develop own methods for the given problem (project report) - K2A_U12

Social competencies: student is prepared to
develop advanced software, deploy it, review the technical documentation and upgrade the existing knowledge (project report) - K2A_K01

Assessment methods and assessment criteria:

Lecture
Written test with open questions or multiple choice questions, or a series of short quizzes after lectures, or an oral exam possible (defined by the invited teacher).
Passing criteria: minimum 60% of correct answers

Projects
Documented project work
Passing criteria: providing and presenting the project work in accordance with the specified requirements of the project task and delivery of program codes and a report.

Semester completion requires:
a) Attendance to all project meetings.
b) Preparation and sending via electronic media all project reports.
c) All reports must be positively graded.
d) The final grade is the average grade from all reports.

Lectures and project meetings attendance is obligatory as they interfer each other and are provided in shorter blocks of intensive teaching.

The syllabus is valid from academic year 2025/26 and its content cannot be changed during the semester.

Course credits in various terms:

Informatics, full-time master degree studies 3 sem. (InfAAu-SM3)

Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	1	2020/2021-Z	