SYLLABUS

Name: ***Software Development Methodologies (InfAAu-IOT>SM3SDM19)***
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 course emphasizes the practical use of modern software development methodologies within the IoT domain. Students design and implement their own IoT software projects using agile practices, design patterns, and SOLID principles. Projects include hardware integration, cloud communication, and data visualization, with emphasis on code quality and teamwork.

Description:

The course emphasizes the practical use of modern software development methodologies within the IoT domain. Students propose and develop their own project ideas, applying agile practices, design patterns, and SOLID principles to create complete and well-structured software solutions. The projects involve hands-on integration with hardware platforms, covering areas such as data acquisition from sensors, cloud-based communication, and data visualization.
Key focus areas include code quality, modular and maintainable design, effective project management, and the use of collaborative development environments (e.g., Git). The course simulates a real-world development workflow to foster both technical problem-solving and teamwork skills.

ECTS: 1
Total Hours: 25 (15 contact hours / 10 student's own work hours)
Student's Own Work: Implementation of the project and preparation of comprehensive project documentation.

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:

W1 # The student knows design patterns used in object-oriented languages. (project report) # K2A_W07
W2 # The student knows methods for developing software in accordance with the SOLID principles. (project report) # K2A_W14
U1 # The student has the ability to assess code quality and can propose modifications to improve it. (project report) # K2A_U11
U2 # The student can apply appropriate design patterns to solve specific programming problems. (project report) # K2A_U12
K1 # The student understands the fundamental challenges of developing complex applications. (project report) # K2A_K01

Assessment methods and assessment criteria:

- report on the realization and implementation of the design task;
- checking the skills of creating project documentation;

The syllabus is valid for the academic year 2025/2026, and its content will not be subject to change during the semester.

Practical placement:

Not applicable

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	