

Course title: Mechatronics in intelligent building

ECTS credit allocation (and other scores): 5

Semester: spring

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 60

Course coordinator/ Department and e-mail: Szymon Racewicz, Department of Mechatronics,
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Type of classes: classes and lectures

Substantive content

CLASSES: Presentation of didactic stands, discussion of health and safety rules, introduction to the ETS5 software, programming of light control features (time functions, dimming, central functions), programming of shutters and blinds control features (slats control), programming of the KNX display (user pages, weather page, status feedback information), programming of temperature control features, programming of KNX light scenes, testing of PIR detector, testing of smoke detector, programming and testing of integrated presence and dusk sensor.

LECTURES: Introduction to intelligent buildings, introduction to the KNX system, history of the KNX standard and KONNEX association, communication in the KNX system (Twisted Pair, Powerline, KNX Radio Frequency, KNX over IP), topology of the KNX system, telegram in the KNX system, Data Point Types (DPT) overview, construction and operation of the KNX devices, electrical installation of the KNX system, other communication standards used in intelligent buildings, alarm systems (PIR detector, ultrasonic detector, microwave detector), fire systems (smoke detector, flame detector, temperature detector).

Learning purpose: Prepare students to design, implement and service modern installations in intelligent buildings.

On completion of the study programme the graduate will gain:

Knowledge: Knowledge about KNX system and other modern installations in intelligent buildings.

Skills: Ability to design, implement and service installation based on the KNX system.

Social Competencies: Ability to work in a team, awareness of responsibility for the implemented installation.

Basic literature: Backer J., Merz H., Moser V., Hansemann T., Greefe L., Hübner C., Building Automation: Communication Systems with EIB/KNX, LON and BACnet, Springer International Publishing, 2018. Wen J. T., Intelligent Building Control Systems, Springer International Publishing, 2018. Dastbaz M., Gorse C., Moncaster A., Building information modelling, building performance, design and smart construction, Springer International Publishing, 2017.

Supplementary literature: Zaigham M., The Internet of Things in the Industrial Sector: Security and Device Connectivity, Smart Environments, and Industry 4.0, Springer International Publishing, 2019.

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 45

Student's independent work: 80