
Course title: MECHATRONIC SYSTEMS IN VEHICLES

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: Oleksandr Vrublevskiy / Department of Vehicles and Machinery Exploitation, aleksander.wroblewski@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: presentation of didactic stands, introduction to the Simcenter Amesim software, simulating combustion engine actuators (wastegate actuator, throttle actuator system, variable geometry turbine actuator system, EGR actuator system), measurement and analysis of signals in control systems, testing of fuel supply systems, testing the braking system control, testing pressure, temperature, air flow and oxygen sensors, testing the shaft position sensors of induction and hall sensors

LECTURES: Introduction to the automotive mechatronics, vehicle system architecture, electronic control unit, digital modules in the control unit, basic principles of automotive networking, network topology, control mechanisms, classification of bus systems (CAN, LIN, MOST, FlexRay), automotive sensors, sensor measuring principles, electric actuators, electrohydraulic actuators, electronic transmission control (AST), ABS, traction control system, electronic stability program, overview of common rail systems, vehicle security systems, fault diagnostics

Learning purpose: Prepare students to testing, design and service mechatronic systems of vehicle

On completion of the study programme the graduate will gain:

Knowledge: Knowledge about mechatronic systems of vehicle.

Skills: Ability to testing, design and service automotive systems based on mechatronics.

Social Competencies: Ability to work in the team, awareness of responsibility for the mechatronic systems in vehicle.

Basic literature: Automotive Mechatronics, Automotive Networking, Driving Stability Systems, Electronics. Reif, K. (Ed.). Springer international Publishing, 2015., pp. 549. Automotive Mechatronics: Operational and Practical Issues. B.T. Fijalkowski (Ed.), Springer Heidelberg Dordrecht London New York, 2011, pp. 612. THE MECHATRONICS HANDBOOK. Robert H. Bishop (ed.), CRC PRESS, 2002, pp. 1230.

Supplementary literature: Automotive Preset Library
Pico%20Technology/PicoScope6%20Automotive/auto/hta/en/index.htm

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 61

Student's independent work: 64