



## Subject card

|   |   |  |  |                                     |  |            |     |
|---|---|--|--|-------------------------------------|--|------------|-----|
| Subject name and code                       | Mechatronics, PG_00060466   |  |  |                                     |  |            |     |
| Field of study                              | Mechanical and Naval Engineering  |  |  |                                     |  |            |     |
| Date of commencement of studies             | October 2024  | Academic year of realisation of subject                  |  |                                     | 2026/2027  |            |     |
| Education level                             | first-cycle studies   | Subject group  |  |                                     | Obligatory subject group in the field of study<br>Subject group related to scientific research in the field of study |            |     |
| Mode of study                               | Part-time studies   | Mode of delivery   |  |                                     | at the university  |            |     |
| Year of study                               | 3   | Language of instruction                                  |  |                                     | Polish   |            |     |
| Semester of study                           | 5   | ECTS credits   |  |                                     | 4.0  |            |     |
| Learning profile                            | general academic profile  | Assessment form  |  |                                     | assessment   |            |     |
| Conducting unit                             | Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology  |  |  |                                     |  |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  | dr hab. inż. Piotr Mioduszewski  |                                     |  |            |     |
|   | Teachers  |  |  |                                     |  |            |     |
| Lesson types and methods of instruction     | Lesson type   | Lecture  | Tutorial   | Laboratory                          | Project  | Seminar    | SUM |
|   | Number of study hours   | 9.0  | 0.0  | 18.0                                | 0.0  | 0.0        | 27  |
|   | E-learning hours included: 0.0  |  |  |                                     |  |            |     |
| Learning activity and number of study hours | Learning activity   | Participation in didactic classes included in study plan |  | Participation in consultation hours |  | Self-study | SUM |
|   | Number of study hours   | 27   |  | 6.0                                 |  | 67.0       | 100 |
| Subject objectives                          | Familiarizing students with issues related to the construction and operation of mechatronic systems using examples of systems available in modern vehicles  |  |  |                                     |  |            |     |
| Learning outcomes                           | Course outcome  |  | Subject outcome  |                                     | Method of verification   |            |     |
|   | [K6_U05] is able to plant an experiment within the range of measuring the basic operating parameters of mechanical devices using a specialized equipment, interpret the results and reach the correct conclusions   |  | The student is able to perform diagnostics of mechatronic systems used in vehicles.  |                                     | [SU2] Assessment of ability to analyse information<br>[SU4] Assessment of ability to use methods and tools           |            |     |
|   | [K6_W10] possesses knowledge on electronics and electrical engineering  |  | The student knows the structure of mechatronic systems and explains the principles of operation of these systems.                          |                                     | [SW1] Assessment of factual knowledge  |            |     |
|   | [K6_W06] possesses knowledge on automatics and robotics of mechanical systems   |  | The student applies his general knowledge in the field of automation and robotics in the operation and maintenance of mechatronic systems. |                                     | [SW1] Assessment of factual knowledge  |            |     |
| Subject contents                            | Controller area network, communication systems in vehicles. Sensors and controllers used in vehicles. Active and passive safety systems in vehicles (braking, traction control, skidding). Vehicle lighting systems (intelligent headlights). Driving and travelling comfort systems (line assist, park assist, adaptive cruise control, information, navigation, vehicle theft protection). Active vehicle suspension systems. Modern steering systems. Automatic gearboxes. |  |  |                                     |  |            |     |
| Prerequisites and co-requisites             |   |  |  |                                     |  |            |     |
| Assessment methods and criteria             | Subject passing criteria  |  | Passing threshold  |                                     | Percentage of the final grade  |            |     |
|   | Test  |  | 55.0%  |                                     | 70.0%  |            |     |
|   | Performing laboratory tasks   |  | 75.0%  |                                     | 30.0%  |            |     |

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| Recommended reading  | Basic literature                   | Bosch Automotive Handbook 6th Edition, Bentley Publishers, USA, 2005<br><br>The Mechatronics Handbook By Robert H. Bishop, CRC Press, 2002.<br><br>Current articles on solutions for mechatronic systems in vehicles. |
|  | Supplementary literature           | Mechatronics and the Design of Intelligent Machines and Systems By David A. Bradley, CRC Press, 2000  |
|  | eResources addresses               | Adresy na platformie eNauczanie:  |
| Example issues/<br>example questions/<br>tasks being completed | They will be given during lectures |   |
| Work placement   | Not applicable                     |   |