

| <b>STUDY MODULE DESCRIPTION FORM</b>   |   |   |
|--|---|---|
| Name of the module/subject<br><b>Mechatronics in Transportation</b>  |   | Code<br><b>1010612221010642251</b>  |
| Field of study<br><b>Transport</b>   | Profile of study (general academic, practical)<br><b>(brak)</b> | Year /Semester<br><b>1 / 2</b>  |
| Elective path/specialty<br><b>Road Transport</b>   | Subject offered in:<br><b>Polish</b>                            | Course (compulsory, elective)<br><b>obligatory</b>  |
| Cycle of study:<br><b>Second-cycle studies</b>   | Form of study (full-time, part-time)<br><b>full-time</b>        |   |
| No. of hours<br>Lecture: <b>2</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>  |   | No. of credits<br><b>2</b>  |
| Status of the course in the study program (Basic, major, other)<br><b>(brak)</b>   |   | (university-wide, from another field)<br><b>(brak)</b>  |
| Education areas and fields of science and art  |   | ECTS distribution (number and %)  |
| <b>Responsible for subject / lecturer:</b><br>Msc eng Piotr Perz<br>email: piotr.perz@put.poznan.pl<br>tel. 61 224 4514<br>Working Machines and Transportation<br>Piotrowo 3, 60-965 Poznań  |   | <b>Responsible for subject / lecturer:</b><br>Msc eng Jan Górecki<br>email: jan.gorecki@put.poznan.pl<br>tel. 61 665 2053<br>Working Machines and Transportation<br>Piotrowo 3, 60-965 Poznań |
| <b>Prerequisites in terms of knowledge, skills and social competencies:</b>  |   |   |
| 1  | <b>Knowledge</b>  | Knowledge of the component systems of vehicles, their construction, performance and principles of operation.  |
| 2  | <b>Skills</b>   | The selection of sensors, actuators and measurement systems in vehicles   |
| 3  | <b>Social competencies</b>                                      | It has a sense of responsibility for decisions made in the design process.  |
| <b>Assumptions and objectives of the course:</b><br>Getting to the construction, operation, mechatronic systems in transport.  |   |   |
| <b>Study outcomes and reference to the educational results for a field of study</b>  |   |   |
| <b>Knowledge:</b>  |   |   |
| 1. Knowledge of control systems in vehicles, their construction, parameters and principles of operation - [K2A_W14]  |   |   |
| 2. Knowledge of control systems for automated warehouse systems - [K2A_W15]  |   |   |
| <b>Skills:</b>   |   |   |
| 1. The selection of sensors, actuators and measuring systems - [K2A_U15]   |   |   |
| 2. Diagnosing faults occurring in mechatronic systems - [K2A_U14]  |   |   |
| <b>Social competencies:</b>  |   |   |
| 1. Understand the need for lifelong learning; able to inspire and organize the learning process of others - [K2A_K04]  |   |   |
| 2. Is aware of and understands the importance and impact of non-technical aspects of mechanical engineering activities and its impact on the environment and responsibility for decisions - [K2A_K02]                                    |   |   |
| 3. Is aware of its social and mechanical engineer and understands the need for and ability to deliver opinions and knowledge of the art technology in the field of mechanical engineering, especially through the mass media - [K2A_K08] |   |   |
| <b>Assessment methods of study outcomes</b>  |   |   |
| written test   |   |   |
| <b>Course description</b>  |   |   |

|   |                             |             |
|---|-----------------------------|-------------|
| Principle of operation and construction of the systems responsible for maintaining the temperature in the vehicle (heating, air conditioning). Electronic engine controls. Electronic control of the clutch. Automatic speed control (cruise control). Application and data bus protocols to transfer information and commands between mechanical components and drivers. Block Diagram of systems. The types of data networks for use in vehicles. Buses used in vehicles: CAN, LIN, MOST, FlexRay. Construction and operation of automated storage systems. Construction of stacker cranes with power and control. Construction of cargo handling systems. Automated parking systems. |                             |             |
| <b>Basic bibliography:</b>  |                             |             |
| <b>Additional bibliography:</b>   |                             |             |
| <b>Result of average student's workload</b>   |                             |             |
| <b>Activity</b>   | <b>Time (working hours)</b> |             |
| 1. Participation in the lecture   | 30                          |             |
| 2. Fixing the lecture   | 10                          |             |
| 3. Consultation regarding the content of the lecture  | 4                           |             |
| 4. Exam Preparation   | 4                           |             |
| 5. Participation in the exam  | 2                           |             |
| <b>Student's workload</b>   |                             |             |
| <b>Source of workload</b>   | <b>hours</b>                | <b>ECTS</b> |
| Total workload  | 50                          | 2           |
| Contact hours   | 36                          | 1           |
| Practical activities  | 0                           | 0           |