



Subject card

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| Subject name and code | Mechatronic design, PG_00033865 | | | | | | |
| Field of study | Nanotechnology | | | | | | |
| Date of commencement of studies | October 2021 | Academic year of realisation of subject | | | 2023/2024 | | |
| Education level | first-cycle studies | Subject group | | | Optional subject group Subject group related to scientific research in the field of study | | |
| Mode of study | Full-time studies | Mode of delivery | | | at the university | | |
| Year of study | 3 | Language of instruction | | | Polish | | |
| Semester of study | 5 | ECTS credits | | | 2.0 | | |
| Learning profile | general academic profile | Assessment form | | | assessment | | |
| Conducting unit | Zakład Mechatroniki -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | prof. dr hab. inż. Krzysztof Kaliński | | | | | |
| | Teachers | dr inż. Natalia Stawicka-Morawska prof. dr hab. inż. Krzysztof Kaliński | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 0.0 | 15.0 | 0.0 | 30 |
| | 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 | 30 | 1.0 | | 19.0 | 50 | |
| Subject objectives | Acquiring basic knowledge and skills in scope of modelling of mechatronic systems and mechatronic design. | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | Method of verification | | |
| | K6_W09 | Student recognizes methods designing the structure of mechatronic systems and observed signals. Student defines team tasks of mechatronic design. | | | [SW1] Assessment of factual knowledge | | |
| | K6_U04 | The student identifies phenomena related to functioning of mechatronic systems | | | [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools | | |
| | K6_U07 | The student demonstrates mastery of mechatronic design methods of stationary systems and their economics use. | | | [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject | | |
| Subject contents | LECTURES. Basic definitions and terms of mechatronics. Modelling in mechatronics. Models of mechatronic systems components. Analogies between physical environments. Dynamic equations in generalised coordinates. Transfer function. Static characteristics. The problems of mechatronic design. Means of the mechatronic projects performance. Modelling of multi-body systems. Eigenvibrations of the finite-degree-of-freedom systems. Multidimensional control systems. LABORATORY. Identification of mechatronic component in the projects. Propositions of mechatronic solutions and concept of their performance. | | | | | | |

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| Prerequisites and co-requisites | <p>Mechanics of solids and fluids.</p> <p>Introduction to electronics and electrical engineering.</p> | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Passing colloquium | 50.0% | 50.0% |
| | Project | 100.0% | 50.0% |
| Recommended reading | Basic literature | <ol style="list-style-type: none"> 1. Gawrysiak M.: Mechatronics and mechatronic design. Białystok: The Publication of BUT 1997 (accessible in internet). 2. Heimann B., Gerth W., Popp K.: Mechatronics. Components methods examples. Warszawa: Scientific Publication PWN 2001. 3. Mechatronic design. Chosen problems. (Ed. T. Uhl). Kraków: Chair of Robotics and Mechatronics AGH, every year since 2006 4. Cannon R. H.: Dynamics of physical systems. Warszawa: WNT 1973. | |
| | Supplementary literature | <ol style="list-style-type: none"> 1. Kaczorek T.: Control and systems theory. Warszawa: Scientific Publication PWN 1993. 2. Kaliński K.: A surveillance of dynamic processes in mechanical systems. Gdańsk: The Publication of GUT 2012. 3. Grzeżożek W., Adamiec-Wójcik I., Wojciech S.: Computer modelling of the car vehicles dynamics. Kraków: The T. Kościuszko Cracow University of Technology 2003. | |
| | eResources addresses | <p>Adresy na platformie eNauczenie:</p> <p>Projektowanie mechatroniczne, W, Nano, Ist, sem. 05, zima, 2023/24, (PG_00033865) - Moodle ID: 33596 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=33596</p> | |
| Example issues/ example questions/ tasks being completed | <ol style="list-style-type: none"> 1. Development of functional systems design. The tasks of mechatronic design. 2. The dissipating energy components of mechatronic systems. 3. 2-wheeled mobile robot as example of original mechatronic device. 4. Example of mechatronic design on a basis about the only systems knowledge. 5. Modelling of multi-body systems. Dynamic equations. | | |
| Work placement | Not applicable | | |