GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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| Subject name and code | Intelligent Robots, PG_00047699 | | |
| Field of study | Automatic Control, Cybernetics and Robotics | | |
| Date of commencement of studies | October 2022 | Academic year of realisation of subject | 2024/2025 |
| Education level | first-cycle studies | Subject group | Optional subject group<br>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 | 6 | ECTS credits | 3.0 |
| Learning profile | general academic profile | Assessment form | exam |
| Conducting unit | Department of Decision Systems and Robotics -> Faculty of Electronics, Telecommunications and Informatics | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr hab. inż. Michał Czubenko | |
| | Teachers | mgr inż. Jan Glinko<br>mgr inż. Marek Grzegorek<br>dr hab. inż. Michał Czubenko | |

| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|---|
| | Number of study hours | 15.0 | 0.0 | 15.0 | 15.0 | 0.0 | 45 |
| | 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 | 45 | 3.0 | 27.0 | 75 |

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| Subject objectives | The aim of the subject is to teach students about robot navigation, algorithms of path planning and the problems of SLAM. |

Learning outcomes

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment | student learned how mobile robots can be used to perform the selected tasks | [SU1] Assessment of task fulfilment |
| [K6_W03] knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum | student got familiar with the issues on robot control | [SW1] Assessment of factual knowledge |
| [K6_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions | student got familiar with algorithms for navigation of intelligent robots | [SU1] Assessment of task fulfilment |

<table>
<tr><td>Subject contents</td><td colspan="2">The content of the subject includes problems of robot navigation, patch planning algorithms. It concerns SLAM problem for a single robot as well as a group of robots. For this matter the group strategies for robots, formation making and group cooperation are discussed. This includes intelligent methods (e.g. decision trees, fuzzy logic, map interactions) and their usage in intelligent robots.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td colspan="2"></td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Exam</td><td>50.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>E. Bekir, Introduction to Modern Navigation Systems, World Scientific Publishing Co 2007</td></tr>
<tr><td>Supplementary literature</td><td>D. Cook, Intermediate Robot Building (Technology in Action), Apress 2009</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:<br>Roboty inteligentne [lato 2025] - Moodle ID: 45077<br>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=45077</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2"></td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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