University of Gdańsk

# Subject card

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|---|---|---|---|
| Subject name and code | Fundamentals of automatics - lecture, PG_00131477 | | |
| Field of study | Marine Hydrography | | |
| Date of commencement of studies | October 2024 | Academic year of realisation of subject | 2025/2026 |
| Education level | Bachelor's studies | Subject group | Obligatory subject group in the field of study |
| Mode of study | full-time studies | Mode of delivery | at the university |
| Year of study | 2 | Language of instruction | Polish<br>polish |
| Semester of study | 3 | ECTS credits | 1.0 |
| Learning profile | practical | Assessment form | credit |
| Conducting unit | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | prof. dr hab. inż. Bogdan Żak | |
| | Teachers | prof. dr hab. inż. Bogdan Żak | |

**Lesson types**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 10.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10 |

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 | 10 | 2.0 | 13.0 | 25 |

**Subject objectives**

To impart knowledge about the construction and principle of operation of automatic control systems.To learn methods of description of automatic control systems, to master methods of analysis of linear automatic control systems and methods of stability testing.To develop the ability to determine the dynamic characteristics of linear systems and determine on their basis the dynamic properties of the object, and to analyze automatic control systems.

<table>
<tr><td>Learning outcomes</td><td>
<table>
<tr><th>Course outcome</th><th>Subject outcome</th><th>Method of verification</th></tr>
<tr><td>[HML3-W03] directions of development and the latest discoveries in the field of scientific disciplines forming the theoretical basis appropriate to the field of study</td><td>Knows:<br>Structures and operating principles of automatic control systems;<br>Methods of describing linear automatic control systems and methods of their analysis.</td><td>[SW4] test/exam - oral or written</td></tr>
<tr><td>[HML3-W12] basic processes taking place in the life cycle of devices, facilities and technical systems</td><td>Knows:<br>Structures and operating principles of automatic control systems;<br>Transmittance models of basic dynamic objects;<br>Methods of description and analysis of linear automatic control systems.</td><td>[SW4] test/exam - oral or written</td></tr>
<tr><td>[HML3-W01] selected facts, phenomena and processes, as well as methods and theories concerning them, explaining the complex relationships between them, constituting basic general knowledge in the field of scientific disciplines forming the theoretical foundations specific to the field of study</td><td>Knows:<br>Structures and operating principles of automatic control systems;<br>Methods of analysis of linear automatic control systems.</td><td>[SW4] test/exam - oral or written</td></tr>
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<tr><td>Subject contents</td><td>Basic concepts of automation. Classification of UARs. Mathematical description of UARs. Dynamic characteristics. Basic dynamic members of automatic control systems. Stability of linear automatic control systems. Block diagrams in automation. Quality of linear automatic control systems.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>test</td><td>51.0%</td><td>100.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. BEŃSKI J., KICIŃSKI W., ŻAK B.: Automatics. Part III. Laboratory exercises. AMW, Gdynia 1990.<br>2. KACZOREK T.: Fundamentals of control theory. WNT, Warsaw 2005.<br>3. KITOWSKI Z.: Automatics. Accounting exercises. AMW, Gdynia 1989.</td></tr>
<tr><td>Supplementary literature</td><td>OGATA K.: Modern Control Engineering. Wiley and Sons, 2013.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Types of dynamic characteristics of UARs; Criteria and conditions for stability of UARs; Criteria for quality of regulation; Classification of UARs, What is the linearization of systems, Basic dynamic members of UARs and their characteristics.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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