GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

| | | | |
|---|---|---|---|
| Subject name and code | Microeconomic Mechanisms in Computer Communications, PG_00048057 | | |
| Field of study | Informatics | | |
| Date of commencement of studies | February 2025 | Academic year of realisation of subject | 2024/2025 |
| Education level | second-cycle studies | Subject group | Optional subject group<br>Specialty 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 | 1 | Language of instruction | Polish |
| Semester of study | 1 | ECTS credits | 3.0 |
| Learning profile | general academic profile | Assessment form | exam |
| Conducting unit | Department of Computer Communications -> Faculty of Electronics, Telecommunications and Informatics | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr hab. inż. Jerzy Konorski | |
| | Teachers | dr hab. inż. Jerzy Konorski | |

**Lesson types and methods of instruction**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 15.0 | 0.0 | 0.0 | 0.0 | 15.0 | 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 | 6.0 | 39.0 | 75 |

**Subject objectives**

Outline of computer networks analysis in the noncooperative paradigm.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K7_U08] while identifying and formulating engineering tasks specifications and solving these tasks, can: - apply analytical, simulation and experimental methods, - notice their systemic and non-technical aspects, - make a preliminary economic assessment of suggested solutions and engineering work | Student can solve simple games modelling noncooperative behavior of network components. | [SU4] Assessment of ability to use methods and tools |
| [K7_W101] is able to make an in-depth identification of key objects and phenomena related to the field of study, as well as theories that describe them and applicable analytical and design methods | Student identifies conflicts of interests among parties of network communication processes, and associates with them suitable elements of the game theory apparatus. | [SW1] Assessment of factual knowledge |
| [K7_W03] knows and understands, to an increased 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 understands the description of noncooperative behavior of network elements and its implications for prediction of the network operating point. | [SW2] Assessment of knowledge contained in presentation<br>[SW1] Assessment of factual knowledge |
| [K7_W01] knows and understands, to an increased extent, mathematics to the extent necessary to formulate and solve complex issues related to the field of study | Student understands relevant notions and methods of noncooperative game theory that are necessary to analyze networking environments in the noncooperative paradigm | [SW1] Assessment of factual knowledge |

<table>
<tr><td>Subject contents</td><td colspan="3">1. Introduction to the course, assessment items 2. Network technologies versus types of network services, microeconomic design paradigm 3. Principles of creation of a traffic contract 4. Overprovisioning as an alternative to congestion control 5. Design of communication mechanisms for cooperative and noncooperative environments 6. Pricing mechanisms as economic and technological tools 7. Protocols of fair information exchange at the user-to-network interface 8. Structure and parameter negotiation in traffic contracts 9. Examples of static and dynamic contracts 10. Microeconomic models of selected network mechanisms and services 11. Use of mechanism design to control network performance 12. Realization of selected incentive compatible mechanisms in computer communication networks 13. Strategic equilibrium: determination and comparison with globally optimal network operation 14. Principles of design of reputation mechanisms in wireless networks</td></tr>
<tr><td>Prerequisites and co-requisites</td><td colspan="3"></td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><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>50.0%</td></tr>
<tr><td>presentation of selected material</td><td>50.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">C. Courcoubetis, R. Weber: Pricing communication networks, J. Wiley 2003 (fragments)<br><br>E. Rasmusen: Games and information, Blackwell 2001 (ch. 1-6)</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">No requirements</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3"></td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
</table>

Document generated electronically. Does not require a seal or signature.