

## Subject card

|                                             |                                                                                                                                                                                                                   |                                                          |                                                                                                                                                                                                                                     |                                     |                                                                                                                                                |            |     |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | , PG_00155263                                                                                                                                                                                                     |                                                          |                                                                                                                                                                                                                                     |                                     |                                                                                                                                                |            |     |
| Field of study                              | Informatics                                                                                                                                                                                                       |                                                          |                                                                                                                                                                                                                                     |                                     |                                                                                                                                                |            |     |
| Date of commencement of studies             | October 2025                                                                                                                                                                                                      |                                                          | Academic year of realisation of subject                                                                                                                                                                                             |                                     | 2025/2026                                                                                                                                      |            |     |
| Education level                             | Master's studies                                                                                                                                                                                                  |                                                          | Subject group                                                                                                                                                                                                                       |                                     | Obligatory subject group in the field of study<br>Optional subject group<br>Subject group related to scientific research in the field of study |            |     |
| Mode of study                               | part-time studies                                                                                                                                                                                                 |                                                          | Mode of delivery                                                                                                                                                                                                                    |                                     | at the university                                                                                                                              |            |     |
| Year of study                               | 1                                                                                                                                                                                                                 |                                                          | Language of instruction                                                                                                                                                                                                             |                                     | Polish                                                                                                                                         |            |     |
| Semester of study                           | 2                                                                                                                                                                                                                 |                                                          | ECTS credits                                                                                                                                                                                                                        |                                     | 7.0                                                                                                                                            |            |     |
| Learning profile                            | academic                                                                                                                                                                                                          |                                                          | Assessment form                                                                                                                                                                                                                     |                                     | exam                                                                                                                                           |            |     |
| Conducting unit                             |                                                                                                                                                                                                                   |                                                          |                                                                                                                                                                                                                                     |                                     |                                                                                                                                                |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                |                                                          | dr Andrzej Borzyszkowski                                                                                                                                                                                                            |                                     |                                                                                                                                                |            |     |
|                                             | Teachers                                                                                                                                                                                                          |                                                          | dr Andrzej Borzyszkowski                                                                                                                                                                                                            |                                     |                                                                                                                                                |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                       | Lecture                                                  | Tutorial                                                                                                                                                                                                                            | Laboratory                          | Project                                                                                                                                        | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                             | 20.0                                                     | 0.0                                                                                                                                                                                                                                 | 20.0                                | 0.0                                                                                                                                            | 0.0        | 40  |
|                                             | 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                                                                                                                                                                                             | 40                                                       |                                                                                                                                                                                                                                     | 0.0                                 |                                                                                                                                                | 0.0        | 40  |
| Subject objectives                          | Familiarization of students with<br><br>Petri nets as a tool to model concurrent processes<br><br>selected programming tools for the practical use of Petri nets                                                  |                                                          |                                                                                                                                                                                                                                     |                                     |                                                                                                                                                |            |     |
| Learning outcomes                           | Course outcome                                                                                                                                                                                                    |                                                          | Subject outcome                                                                                                                                                                                                                     |                                     | Method of verification                                                                                                                         |            |     |
|                                             | [INFMU2_W01] has in-depth knowledge of the branches of mathematics necessary for the study of computer science; has a good understanding of the role and importance of the construction of mathematical reasoning |                                                          | knows the definitions of a Petri net, a condition-event net, a place-transition net, an occurrence net<br><br>knows the tools supporting the use of Petri nets: PIPE2<br><br>knows the possible fields of application of Petri nets |                                     | [SW4] test/exam - oral or written<br>[SW5] implementation of a problem task                                                                    |            |     |
|                                             | [INFMU2_U01] can apply mathematical knowledge to formulate, analyze and solve tasks related to computer science                                                                                                   |                                                          | is able to build a Petri net to model various elements of programming systems<br><br>is able to express meaningful properties of an information system in terms of Petri nets                                                       |                                     | [SU4] test/exam - oral or written<br>[SU5] implementation of a problem task                                                                    |            |     |

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|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Subject contents                                               | <ul style="list-style-type: none"><li>• foundations of Petri Net Theory</li><li>• condition-event and place-transition nets</li><li>• Occurrence nets</li><li>• properties of Petri nets</li><li>• applications of Petri nets</li><li>• relation to automata theory</li></ul> <p>Familiarization with English terminology</p> |                                                                                                                                                                                                                                                                                                              |                               |
| Prerequisites and co-requisites                                | none                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                              |                               |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                                      | Passing threshold                                                                                                                                                                                                                                                                                            | Percentage of the final grade |
|                                                                | final exam                                                                                                                                                                                                                                                                                                                    | 51.0%                                                                                                                                                                                                                                                                                                        | 40.0%                         |
|                                                                | test                                                                                                                                                                                                                                                                                                                          | 51.0%                                                                                                                                                                                                                                                                                                        | 60.0%                         |
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                              | Andrzej Borzyszkowski, materials for the course available on the website.                                                                                                                                                                                                                                    |                               |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                      | 1. Peter Starke, Sieci Petriego, PWN, 1987<br>2. Petri Nets World: Online Services for the International Petri Nets Community ( <a href="http://www2.informatik.uni-hamburg.de/TGI/PetriNets/">www2.informatik.uni-hamburg.de/TGI/PetriNets/</a> )<br>3. Wolfgang Reisig, Understanding Petri Nets, Springer |                               |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                              |                               |
| Example issues/<br>example questions/<br>tasks being completed | What is the difference between deadlock freedom and liveness in Petri nets? Provide an example.<br><br>What is a place invariant? What is the application of this concept?<br><br>What Petri net equivalences do you know?                                                                                                    |                                                                                                                                                                                                                                                                                                              |                               |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                              |                               |

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