



## Subject card

|   |  |  |                                     |            |  |   |     |
|---|--|--|-------------------------------------|------------|--|---|-----|
| Subject name and code                       | Radio Network Laboratory, PG_00064100  |  |                                     |            |  |   |     |
| Field of study                              | Electronics and Telecommunications   |  |                                     |            |  |   |     |
| Date of commencement of studies             | February 2027  | Academic year of realisation of subject  |                                     |            |  | 2027/2028   |     |
| 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                               | 2  | Language of instruction  |                                     |            |  | Polish  |     |
| Semester of study                           | 3  | ECTS credits   |                                     |            |  | 1.0   |     |
| Learning profile                            | general academic profile   | Assessment form  |                                     |            |  | assessment  |     |
| Conducting unit                             | Department of Radiocommunication Systems and Networks -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology   |  |                                     |            |  |   |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor   | dr inż. Piotr Rajchowski   |                                     |            |  |   |     |
|   | Teachers   | dr inż. Piotr Rajchowski   |                                     |            |  |   |     |
| Lesson types                                | Lesson type  | Lecture  | Tutorial                            | Laboratory | Project  | Seminar   | SUM |
|   | Number of study hours  | 0.0  | 0.0                                 | 15.0       | 0.0  | 0.0   | 15  |
|   | 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  | 15   | 2.0                                 | 8.0        | 25   |   |     |
| Subject objectives                          | Gaining practical knowledge and skills related to realizing measurements of modern wireless networks (e.g. with cellular structure) and general purpose devices using a radio interface. Tasks realized during the course correspond to engineering and scientific practices used in the business environment.   |  |                                     |            |  |   |     |
| Learning outcomes                           | Course outcome   | Subject outcome  |                                     |            | Method of verification   |   |     |
|   | [K7_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of advanced technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment  | Student has learned how to interpret measurement data, is able to assess the credibility of measurements basing on the analysis of results and environmental parameters. Student is able to formulate recommendations based on the obtained results. |                                     |            | [SU2] Assessment of ability to analyse information<br>[SU5] Assessment of ability to present the results of task             |   |     |
|   | [K7_U12] is able, to an increased extent, to analyze the operation of components and systems related to the field of study, as well as to measure their parameters and study their technical characteristics, and to plan and carry out experiments related to the field of study, including computer simulations, interpret the obtained results and draw conclusions | Student is able to use laboratory and field measurement equipment to measure the parameters of wireless networks and radio communication devices. Student is able to prepare measurement scenarios using specialistic tools.                         |                                     |            | [SU4] Assessment of ability to use methods and tools<br>[SU3] Assessment of ability to use knowledge gained from the subject |   |     |

| Subject contents   | <p>Course content – laboratory<br/>Learning of practical measurement methods.</p> <p>Development of measurement scenarios for modern wireless networks (including 5G).</p> <p>Measurements of parameters of modern wireless networks in laboratory and field conditions.</p> <p>Measurements of radio components.</p> <p>Analysis and interpretation of measurement results.</p> <p>Preparation of a report basing on the performed measurements.</p>   |                               |  |                          |   |                               |                                    |                |       |                                     |       |       |
|--|---|-------------------------------|--|--------------------------|---|-------------------------------|------------------------------------|----------------|-------|-------------------------------------|-------|-------|
| Prerequisites and co-requisites                                | Basic knowledge related to usage of measurement equipment (e.g. spectrum analyzer), knowledge about environment for analyzing and presenting measurement data (e.g. Matlab.)  |                               |  |                          |   |                               |                                    |                |       |                                     |       |       |
| Assessment methods and criteria                                | <table border="1" data-bbox="448 647 1487 752"> <thead> <tr> <th data-bbox="448 647 794 680">Subject passing criteria</th> <th data-bbox="794 647 1141 680">Passing threshold</th> <th data-bbox="1141 647 1487 680">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 680 794 714">Short report in middle of semester</td> <td data-bbox="794 680 1141 714">50.0%</td> <td data-bbox="1141 680 1487 714">50.0%</td> </tr> <tr> <td data-bbox="448 714 794 752">Full report at the end of semester.</td> <td data-bbox="794 714 1141 752">50.0%</td> <td data-bbox="1141 714 1487 752">50.0%</td> </tr> </tbody> </table>   |                               |  | Subject passing criteria | Passing threshold   | Percentage of the final grade | Short report in middle of semester | 50.0%          | 50.0% | Full report at the end of semester. | 50.0% | 50.0% |
| Subject passing criteria                                       | Passing threshold   | Percentage of the final grade |  |                          |   |                               |                                    |                |       |                                     |       |       |
| Short report in middle of semester                             | 50.0%   | 50.0%                         |  |                          |   |                               |                                    |                |       |                                     |       |       |
| Full report at the end of semester.                            | 50.0%   | 50.0%                         |  |                          |   |                               |                                    |                |       |                                     |       |       |
| Recommended reading  | <table border="1" data-bbox="448 759 1487 1088"> <tbody> <tr> <td data-bbox="448 759 794 1021">Basic literature</td> <td colspan="2" data-bbox="794 759 1487 1021"> <p>Anritsu Corporation, 5G Measurements Knowledge Hub, 2024</p> <p>Meik Kottkamp i inni, 5G New Radio, Rohde&amp;Schwarz, 2019</p> <p>Mathworks, Test and Measurement: 5G NR waveform generation, visualization, and transmitter performance analysis, 2024</p> </td> </tr> <tr> <td data-bbox="448 1021 794 1055">Supplementary literature</td> <td colspan="2" data-bbox="794 1021 1487 1055">not applicable</td> </tr> <tr> <td data-bbox="448 1055 794 1088">eResources addresses</td> <td colspan="2" data-bbox="794 1055 1487 1088"></td> </tr> </tbody> </table> |                               |  | Basic literature         | <p>Anritsu Corporation, 5G Measurements Knowledge Hub, 2024</p> <p>Meik Kottkamp i inni, 5G New Radio, Rohde&amp;Schwarz, 2019</p> <p>Mathworks, Test and Measurement: 5G NR waveform generation, visualization, and transmitter performance analysis, 2024</p> |                               | Supplementary literature           | not applicable |       | eResources addresses                |       |       |
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| Supplementary literature                                       | not applicable  |                               |  |                          |   |                               |                                    |                |       |                                     |       |       |
| eResources addresses   |   |                               |  |                          |   |                               |                                    |                |       |                                     |       |       |
| Example issues/<br>example questions/<br>tasks being completed | not applicable  |                               |  |                          |   |                               |                                    |                |       |                                     |       |       |
| Practical activites within the subject                         | Not applicable  |                               |  |                          |   |                               |                                    |                |       |                                     |       |       |

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