



Subject card

|   |   |  |                             |                                     |  |            |     |
|---|---|--|-----------------------------|-------------------------------------|--|------------|-----|
| Subject name and code                       | Optoelectronic Devices and Systems, PG_00048689   |  |                             |                                     |  |            |     |
| Field of study                              | Electronics and Telecommunications  |  |                             |                                     |  |            |     |
| Date of commencement of studies             | February 2023   | Academic year of realisation of subject                  |                             |                                     | 2023/2024  |            |     |
| Education level                             | second-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                               | 1   | Language of instruction                                  |                             |                                     | Polish   |            |     |
| Semester of study                           | 2   | ECTS credits   |                             |                                     | 1.0  |            |     |
| Learning profile                            | general academic profile  | Assessment form  |                             |                                     | assessment   |            |     |
| Conducting unit                             | Department of Metrology and Optoelectronics -> Faculty of Electronics, Telecommunications and Informatics                       |  |                             |                                     |  |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  | dr inż. Katarzyna Karpienko |                                     |  |            |     |
|   | Teachers  |  | dr inż. Katarzyna Karpienko |                                     |  |            |     |
| 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  | 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                          | Students are acquiring knowledge and skills to analyze, design, construction and testing of optoelectronic devices and systems. |  |                             |                                     |  |            |     |

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| Learning outcomes  | Course outcome   | Subject outcome   | Method of verification                             |
|  | [K7_U06] can analyse the operation of components, circuits and systems related to the field of study; measure their parameters; examine technical specifications; interpret obtained results and draw conclusions  | can analyse the operation of optical wavefront sensors, adaptive optics systems, ellipsometric systems, microinterferometers and optical fiber gyroscopes; can analyse the operation of optical components specific to those systems;   | [SU2] Assessment of ability to analyse information |
|  | [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.   | knows and understands construction and the operation of optical wavefront sensors, adaptive optics systems, ellipsometric systems, microinterferometers and optical fiber gyroscopes; knows and understands construction and the operation of optical components specific to those systems; | [SW1] Assessment of factual knowledge              |
|  | [K7_U03] can design, according to required specifications, and make a complex 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                            | selects optical wavefront sensors following the requirements; designs systems using optical fiber gyroscopes, low-coherence interferometers and microinterferometers;   | [SU2] Assessment of ability to analyse information |
| [K7_W06] Knows and understands, to an increased extent, the basic processes taking place in the life cycle of devices, facilities and technical systems. | knows and understands factors, phenomena and processes influencing accuracy, resolution and drift in optoelectronic circuits.  | [SW1] Assessment of factual knowledge   |  |
| Subject contents   | <ol style="list-style-type: none"> <li>1. Optoelectronic systems and their applications,</li> <li>2. Optical and Fiberoptic gyroscopes,</li> <li>3. Optical wavefront sensors and their applications,</li> <li>4. Systems using microinterferometers,</li> <li>5. Ellipsometric and polarimetric systems</li> <li>6. Systems using low-coherence interferometry</li> <li>7. Systems using adaptive optics</li> </ol> |   |  |
| Prerequisites and co-requisites  | No requirements  |   |  |
| Assessment methods and criteria  | Subject passing criteria   | Passing threshold   | Percentage of the final grade                      |
|  | colloquium   | 55.0%   | 100.0%   |
| Recommended reading  | Basic literature   | K.J. Gasvik: Optical Metrology<br><br>P.K.Rastogi: Optical Measurement Techniques and Applications<br><br>T.Yoshizawa Handbook of optical metrology   |  |
|  | Supplementary literature   | A set of publications   |  |
|  | eResources addresses   | Adresy na platformie eNauczenie:<br>Urządzenia i Systemy Optoelektroniczne 2023/2024 - Moodle ID: 29418<br><a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=29418">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=29418</a>  |  |
| Example issues/<br>example questions/<br>tasks being completed   |  |   |  |
| Work placement   | Not applicable   |   |  |