



## Subject card

|   |   |  |   |                                     |  |            |     |
|---|---|--|---|-------------------------------------|--|------------|-----|
| Subject name and code                       | Photogrammetry , PG_00044805  |  |   |                                     |  |            |     |
| Field of study                              | Geodesy and Cartography   |  |   |                                     |  |            |     |
| Date of commencement of studies             | October 2020  |  | Academic year of realisation of subject |                                     | 2021/2022  |            |     |
| Education level                             | first-cycle studies   |  | Subject group                           |                                     | Obligatory subject group in the field of study<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                            |                                     | 4.0  |            |     |
| Learning profile                            | general academic profile  |  | Assessment form                         |                                     | exam   |            |     |
| Conducting unit                             | Department of Geodesy -> Faculty of Civil and Environmental Engineering   |  |   |                                     |  |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  | dr inż. Katarzyna Bobkowska             |                                     |  |            |     |
|   | Teachers  |  |   |                                     |  |            |     |
| Lesson types and methods of instruction     | Lesson type   | Lecture  | Tutorial                                | Laboratory                          | Project  | Seminar    | SUM |
|   | Number of study hours   | 30.0   | 0.0                                     | 15.0                                | 15.0   | 0.0        | 60  |
|   | E-learning hours included: 0.0  |  |   |                                     |  |            |     |
|   | Adresy na platformie eNauczanie:  |  |   |                                     |  |            |     |
| 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   | 60   |   | 9.0                                 |  | 31.0       | 100 |
| Subject objectives                          | Preparing the student for the development and analysis of photogrammetric products by introducing theoretical issues and practical work related to the modern techniques and methods of photogrammetry. |  |   |                                     |  |            |     |

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| Learning outcomes               | Course outcome   | Subject outcome   | Method of verification  |
|                                 | [K6_W07] has a well-established knowledge and understands concepts in the field of engineering geodesy including the use of calculations and measurements methods carried out with the use of geodetic instruments and photogrammetric and remote sensing technologies related to geodetic support for investment, surveying and inventory measurements and photogrammetry with remote sensing   | The student knows photogrammetric methods and technologies (types of cameras/sensors), an example of software used to process data. The student knows the methods of measuring photopoints using classic geodetic equipment. The student understands the differences between the use of classical geodetic methods and photogrammetry for the purpose of measuring the geometry of objects. | [SW1] Assessment of factual knowledge<br>[SW3] Assessment of knowledge contained in written work and projects |
|                                 | [K6_U14] can apply the necessary skills to conduct independent work in the field of topographic surveys along with the elaborating of results, geodetic investment service, surveying and inventory measurement, photogrammetry and remote sensing, and making the maps and elaborations for legal purposes including delimitation and subdivision of real estate  | Student is able to plan and acquire data and to develop them using photogrammetry methods.  | [SU1] Assessment of task fulfilment   |
|                                 | [K6_U08] can use modern measurement technologies to solve common tasks in 3D modeling  | The student is able to make a 3D model of an object using (data acquisition, processing, model development, analysis) along with its interpretation. Knows the limitations of 3D modeling methods using photogrammetric techniques.   | [SU1] Assessment of task fulfilment   |
|                                 | [K6_U12] can perform topographic-bathymetric maps of ports, wharf and coastal areas, and can interpret marine charts and maps of coastal regions   | The student is able to measure the coordinates of points (2D and 3D) on the basis of photogrammetry products.   | [SU4] Assessment of ability to use methods and tools  |
| Subject contents                | <p>1. Definition and history of photogrammetry.2. Advantages and disadvantages of using photogrammetric techniques and methods.3. Principles of central and orthogonal projection.4. Geometric principles used when developing the photogrammetric task.5. Cameras used in photogrammetry.6. Stereoscopic vision.7. Development of orthophotomap.8. Development of the 3D model9. Application of photogrammetry in other fields.10. Analysis of photogrammetry products.</p> |   |   |
| Prerequisites and co-requisites |  |   |   |
| Assessment methods and criteria | Subject passing criteria   | Passing threshold   | Percentage of the final grade   |
|                                 | Test   | 60.0%   | 40.0%   |
|                                 | Examination  | 60.0%   | 20.0%   |
|                                 | Project  | 60.0%   | 20.0%   |
|                                 | Laboratory   | 60.0%   | 20.0%   |
| Recommended reading             | Basic literature   | <p>1.Kurczyński Z., Preuss P.: Podstawy fotogrametrii, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2003,</p> <p>2.Kurczyński Z.: Lotnicze i satelitarne obrazowanie Ziemi; Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006,</p> <p>3. Kurczyński Z., Fotogrametria, PWN, Warszawa 2014,</p>  |   |
|                                 | Supplementary literature   | 1. Bernasik J.: Wykłady z fotogrametrii i teledetekcji.   |   |
|                                 | eResources addresses   |   |   |

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| <p>Example issues/<br/>example questions/<br/>tasks being completed</p> | <p>1. Repeat the definition of photogrammetry.2. Briefly discuss the history of photogrammetry.3. Characterize the principles of the perspective and orthogonal projection.4. Briefly characterize the digital image.5. List and discuss cameras used in photogrammetry.6. Describe the procedure for developing an orthophotomap.7. Give examples of the use of photogrammetry in other fields.8. Discuss the geometrical principles to be used in the development of a photogrammetric task.9. Make a fly project.</p> |
| <p>Work placement</p>   | <p>Not applicable</p>  |