



Subject card

| | | | | | | | |
|---|--|--|---|-------------------------------------|--|------------------------|-----|
| Subject name and code | SPECIAL GEODETIC MEASUREMENTS A, PG_00044850 | | | | | | |
| Field of study | Geodesy and Cartography | | | | | | |
| Date of commencement of studies | October 2021 | Academic year of realisation of subject | | | 2023/2024 | | |
| Education level | first-cycle studies | Subject group | | | Optional subject group 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 | 3 | Language of instruction | | | Polish | | |
| Semester of study | 5 | ECTS credits | | | 6.0 | | |
| Learning profile | general academic profile | Assessment form | | | assessment | | |
| Conducting unit | Department of Geodesy -> Faculty of Civil and Environmental Engineering | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr inż. Marek Zienkiewicz | | | | |
| | Teachers | | dr inż. Marek Zienkiewicz | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 30.0 | 15.0 | 15.0 | 0.0 | 0.0 | 60 |
| | 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 | 60 | | 9.0 | | 81.0 | 150 |
| Subject objectives | Teaching students issues related to the deformation analysis of geodetic network. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | | Method of verification | |
| | [K6_W11] understands the concepts and has in-depth knowledge in the field of geodetic building monitoring, extended with basic knowledge in the field of statics and dynamics of engineering structures | | [K6_W11] Performs geodetic measurements and carries out appropriate calculations related to geodetic monitoring of buildings, | | | | |
| | [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 | | [K6_W07] The student performs calculations by using the least squares method, | | | | |

| Subject contents | <p>Lecture topics</p> <ol style="list-style-type: none"> 1. Development of geodetic observations by using the least squares method, 2. Free adjustment of geodetic networks, 3. Geodetic measurements of displacements - introduction to the issue, 4. Designing of a control network, 5. Selected measurement methods used in determining displacements, 6. Selected issues in the field of the reliability theory of geodetic networks, 7. Adjustment of geodetic networks in constrained datums, 8. Initial adjustment of observations, 9. Identification of stable reference points, 10. Estimation of displacements of controlled points, 11. Assessment of the significance of the designated displacements, 12. Modern methods of deformation analysis of geodetic network - introduction to the issue, 13. The method of the global congruency test (GCT), 14. Weighted iterative S-transformation method, 15. Geometric interpretation of determined displacements. <p>Laboratory topics</p> <p>Performing geodetic calculations regarding:</p> <ul style="list-style-type: none"> - adjustment of geodetic observations by using the least squares method, - free adjustment of observations by using the least squares method, - preliminary development of geodetic observations in the context of diagnostics and the location of potential outliers, - identification of stable reference points by using the Fredericton approach, - calculation of displacements of controlled points with an assessment of the significance of the determinations made. <p>Exercise topics</p> <p>Performing the deformation analysis of the angular-linear network designed in the area of the water dam in Montsalvenes (Switzerland).</p> | | | | | | | | | | | | | | |
|--|---|-------------------------------|--|--------------------------|---|-------------------------------|--------------------------------------|--|------|--|----------------------------------|------|------------|-------|--------|
| Prerequisites and co-requisites | Independent use of traditional and modern geodetic instruments, ability to work in a team, mastered basics of matrix calculus and methods of developing of geodetic observations. | | | | | | | | | | | | | | |
| Assessment methods and criteria | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Subject passing criteria</th> <th style="width: 30%;">Passing threshold</th> <th style="width: 30%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Laboratories. Passing all exercises.</td> <td>100.0%</td> <td>0.0%</td> </tr> <tr> <td>Exercise. Correct execution of the geodetic project.</td> <td>100.0%</td> <td>0.0%</td> </tr> <tr> <td>Final exam</td> <td>60.0%</td> <td>100.0%</td> </tr> </tbody> </table> | | | Subject passing criteria | Passing threshold | Percentage of the final grade | Laboratories. Passing all exercises. | 100.0% | 0.0% | Exercise. Correct execution of the geodetic project. | 100.0% | 0.0% | Final exam | 60.0% | 100.0% |
| Subject passing criteria | Passing threshold | Percentage of the final grade | | | | | | | | | | | | | |
| Laboratories. Passing all exercises. | 100.0% | 0.0% | | | | | | | | | | | | | |
| Exercise. Correct execution of the geodetic project. | 100.0% | 0.0% | | | | | | | | | | | | | |
| Final exam | 60.0% | 100.0% | | | | | | | | | | | | | |
| Recommended reading | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Basic literature</td> <td colspan="2" data-bbox="799 1189 1489 1473"> <p>Wiśniewski Z. 2016. Rachunek wyrównawczy w geodezji z przykładami,</p> <p>Wiśniewski Z. 2013. Zaawansowane metody opracowania obserwacji geodezyjnych z przykładami,</p> <p>Prószyński W., Kwaśniak M. 2015. Podstawy geodezyjnego wyznaczania przemieszczeń</p> </td> </tr> <tr> <td>Supplementary literature</td> <td colspan="2" data-bbox="799 1480 1489 1742"> <p>Koch K.R. 1999. Parameter estimation and hypothesis testing in linear models,</p> <p>Caspary W. F. 2000. Concepts of network and deformation analysis</p> <p>Prószyński W., Kwaśniak M. 2002. Niezawodność sieci geodezyjnych</p> </td> </tr> <tr> <td>eResources addresses</td> <td colspan="2" data-bbox="799 1749 1489 1780">Adresy na platformie eNauczanie:</td> </tr> </table> | | | Basic literature | <p>Wiśniewski Z. 2016. Rachunek wyrównawczy w geodezji z przykładami,</p> <p>Wiśniewski Z. 2013. Zaawansowane metody opracowania obserwacji geodezyjnych z przykładami,</p> <p>Prószyński W., Kwaśniak M. 2015. Podstawy geodezyjnego wyznaczania przemieszczeń</p> | | Supplementary literature | <p>Koch K.R. 1999. Parameter estimation and hypothesis testing in linear models,</p> <p>Caspary W. F. 2000. Concepts of network and deformation analysis</p> <p>Prószyński W., Kwaśniak M. 2002. Niezawodność sieci geodezyjnych</p> | | eResources addresses | Adresy na platformie eNauczanie: | | | | |
| Basic literature | <p>Wiśniewski Z. 2016. Rachunek wyrównawczy w geodezji z przykładami,</p> <p>Wiśniewski Z. 2013. Zaawansowane metody opracowania obserwacji geodezyjnych z przykładami,</p> <p>Prószyński W., Kwaśniak M. 2015. Podstawy geodezyjnego wyznaczania przemieszczeń</p> | | | | | | | | | | | | | | |
| Supplementary literature | <p>Koch K.R. 1999. Parameter estimation and hypothesis testing in linear models,</p> <p>Caspary W. F. 2000. Concepts of network and deformation analysis</p> <p>Prószyński W., Kwaśniak M. 2002. Niezawodność sieci geodezyjnych</p> | | | | | | | | | | | | | | |
| eResources addresses | Adresy na platformie eNauczanie: | | | | | | | | | | | | | | |
| Example issues/ example questions/ tasks being completed | <ol style="list-style-type: none"> 1. The geodetic control network design, 2. Testing of the stability of potential reference points, 3. Determination of displacements of controlled points, 4. Diagnostics of observational material and localization of potential outliers. | | | | | | | | | | | | | | |
| Work placement | Not applicable | | | | | | | | | | | | | | |