Subject card

| Subject name and code | Architectural geometry, PG_00052771 |  |  |  |  |  |  |
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| Field of study | Architecture |  |  |  |  |  |  |
| Date of commencement of studies | October 2021 |  | Academic year of realisation of subject |  |  | 2021/2022 |  |
| Education level | first-cycle studies |  | Subject group |  |  | Obligatory subject group 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 |  |  | 3.0 |  |
| Learning profile | general academic profile |  | Assessment form |  |  | exam |  |
| Conducting unit | Faculty of Architecture |  |  |  |  |  |  |
| Name and surname of lecturer (lecturers) | Subject supervisor |  | dr inż. arch. Anna Wancław |  |  |  |  |
|  | Teachers |  | dr inż. arch. Anna Wancław mgr inż. arch. Kacper Radziszewski mgr inż. arch. Michał Malewczyk |  |  |  |  |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Projec | t Seminar | SUM |
|  | Number of study hours | 15.0 | 0.0 | 0.0 | 15.0 | 0.0 | 30 |
|  | E-learning hours included: 0.0 |  |  |  |  |  |  |
|  | Adresy na platformie eNauczanie: <br> Geometria dla architekta 2021/2022-Moodle ID: 21692 <br> https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21692 |  |  |  |  |  |  |
| 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 | 30 |  | 6.0 |  | 39.0 | 75 |
| Subject objectives | The development of spatial vision and the ability to apply it in the architectural design, skills in using axonometric drawing and perspective. |  |  |  |  |  |  |
| Learning outcomes | Course outcome |  | Subject outcome |  |  | Method of verification |  |
|  | [K6_W01] knows and understands construction problems, building and engineering issues related to building design; principles, solutions, constructions and building materials used in simple engineering tasks in the field of architectural and urban design |  | Correctly constructs and reads spatial objects (including curves and surfaces) in different types of projections, also using popular digital programs; with their help solves simple spatial problems. |  |  | [SW1] Assessment of factual knowledge |  |
|  | [K6_U04] is able to use analytical methods to formulate and solve project tasks |  | He is able to present the effects of work attractively, also using popular digital programs. |  |  | [SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject |  |


| Subject contents | lectures: |
| :---: | :---: |
|  | 1. One-point perspective, circle in perspecrive |
|  | 2. Orthogonal perspective. Shadows in prespective |
|  | 3. Settings in digital perspective |
|  | 4. Regular and semi-regular polyhedrons and geodesic domes. |
|  | 5. Curves and their properties. Properties of digital curves. |
|  | 6. Surfaces and their properties. Surface classification. Construction of the surface. Piercing points. |
|  | 7, 8. Stage II surfaces and their cross-sections. Conical curves. Affinity relationship elipse with circle |
|  | 9. Straight and screw surfaces. Digitally surfaces. Methods of creation. Curves and "offset" surfaces |
|  | 10, 11. Intersection of surface. The vault. |
|  | 12. Computer modifications and surface transformations. Models and surface developments. |
|  | 13, 14. Sufraces in architecture. |
|  | 15. Review of issues. Preparation for the exam |
|  | design: |
|  | 1. Horizontal projection - basic constructions, drawing |
|  | 2. Horizontal projection - a road project in the terrain (laboratory) |
|  | 3. One point perspective, the circle and shadow |
|  | 4,5. Vertical perspective with shadow, homework - settings of digital perspective |
|  | 6, 7. (laboratory). Regular and semi-regular polyhedrons and geodesic domes |
|  | 8. TEST - roofs and shadow, horizontal projection, perspective. |
|  | 9. Construction of sufrace, piercing points |
|  | 10, 11. (laboratory) Ruled surfaces. |
|  | 12. conical cross-sections |
|  | 13. Intersection of surfaces |
|  | 14, 15 (laboratory) Surfaces - selected issues |


| Prerequisites and co-requisites |  |  |  |
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| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
|  | Quality of drawings | 100.0\% | 33.0\% |
|  | Final exam | 51.0\% | 34.0\% |
|  | Test | 51.0\% | 33.0\% |
| Recommended reading | Basic literature | H. Pottmann, A. Asperl, M. Hofer, A. Kilian, Architectural geometry, Bentley Institute Press 2007 |  |
|  |  | Przyłucka K., Helenowska-P http://www.pg.gda.pl/~mhele <br> Helenowska-Peschke M., W http://pbc.gda.pl/dlibra/docco <br> Helenowska-Peschke M., W pbc.gda.pl/dlibra/docconten | M. Wykłady z geometrii wykreślnej dex.html <br> A., Zadania z geometrii wykreślnej. $i d=2597$ <br> A., Konstrukcje cieni, http:// 66 |
|  | Supplementary literature | Górska R., Geometria wykreślna, Kraków 2015 |  |
|  |  | Otto F.E., Geometria wykreślna, |  |
|  |  | Jankowski W.,Geometria wykreślna, |  |
|  |  | Grochowski B., Geometria wykreślna z perspektywą stosowana, |  |
|  |  | Bruzda J., Szkice Perspektywiczne w architekturze, Warszawa, 1971 |  |
|  |  | Romaszkiewicz-Białas T., Perspektywa praktyczna dla architektów, Wrocław, 1991 |  |
|  | eResources addresses | Geometria dla architekta 2021/2022 - Moodle ID: 21692 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21692 |  |
| Example issues/ example questions/ tasks being completed | 1. Constructs the perspetcive of a given plans of the objects and its shadow according to a given light ray. |  |  |
|  | 2. According to the given light ray construct the own shadow of a sphere and the shadw cast on the plane of the projection of the sphere |  |  |
|  | 3. According to the given light ray construct the common cast shadow of a sphere and torus |  |  |
|  | 4. According to the given light ray construct the shadow of the complex surface (surface combined from torus and hemisphere) |  |  |
|  | 5. Construct the interior shadow of cone according to the given light ray |  |  |
|  | 6. Create a ruled surface in parametric mode (Grasshopper) |  |  |
| Work placement | Not applicable |  |  |

