Detailed course description
(SUBJ ECT CARD)

Course title: Engineering graphics
Course code: W21-2D

Classification of a course group:
Course type: basic / field-related* obligatory / *
Field of study: Level of study: Profile of study: Mode of study: Specialty (specialisation):
Course code: W21-2D Classification of a course group:
Course type: basic / field-related* obligatory / *
Field of study: Level of study: Profile of study: Mode of study: Specialty (specialisation):
Year of study: I Semester: 1
Teaching modes and teaching hours:
Language/s of instruction: English
Number of ECTS credits (according to the study programme): 5

1. Course objectives: An education of geometrical bases for the conscious shaping of a building structure.
   Acquiring the skill of projection methods for spatial solids on the drawing plane using freehand drawing
   and computer techniques. Acquiring skills in descriptive methods of visualization of geometrical objects.
   Developing of the spatial imagination.

2. Relation of the field-related learning outcomes to modes of teaching and methods of verification as well
   as to assessment of student’s learning outcomes:

<table>
<thead>
<tr>
<th>symbol</th>
<th>assumed learning outcomes a student who completed the course</th>
<th>teaching modes</th>
<th>verification methods and learning outcomes assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1A_W02_01</td>
<td>Knows the methods of projection of the graphic spatial elements used in engineering practice and geodesy</td>
<td>Lecture, laboratory classes</td>
<td>Colloquium</td>
</tr>
<tr>
<td>K1A_W02_02</td>
<td>Knows the compounds and spatial relations arising from the mutual positions of spatial elements</td>
<td>Lecture, laboratory classes</td>
<td>Colloquium</td>
</tr>
<tr>
<td>K1A_W02_03</td>
<td>Knows the rules for preparing simple construction drawings by using computer techniques</td>
<td>Laboratory classes</td>
<td>Design work</td>
</tr>
</tbody>
</table>

Skills: a student can

<table>
<thead>
<tr>
<th>symbol</th>
<th>assumed learning outcomes a student who completed the course</th>
<th>teaching modes</th>
<th>verification methods and learning outcomes assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1A_U07_01</td>
<td>Is able to solve tasks in the field of constructing geometric objects</td>
<td>Laboratory classes</td>
<td>Colloquium</td>
</tr>
<tr>
<td>K1A_U07_02</td>
<td>Is able to carry out geometric analysis of building objects on the basis of drawing documentation</td>
<td>Laboratory classes</td>
<td>Design work</td>
</tr>
</tbody>
</table>

Social competences: a student is prepared to

3. The content of study programme ensuring learning outcomes (according to the study programme):

   The concept of a projection. Projection methods used. Parallel projection and it’s properties. Orthogonal
   projection. Mongean projection. Projection of elementary geometrical elements. Orthographic projection -
   views. Parallel projection - axonometry, definition, various sorts of axonometry. Affiliation of elements
   Perpendicular elements. Scales and dimensions in technical drawing. Sections, cross-section and section
   of the cone and the cylinder. Topographic projection. Earthworks. Basics of CAD.

4. Description of methods of determination of ECTS credits:

<table>
<thead>
<tr>
<th>Type of activity</th>
<th>Number of hours / ECTS credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of course hours regardless of a teaching mode</td>
<td>45</td>
</tr>
<tr>
<td>Preparation for a course</td>
<td>30</td>
</tr>
<tr>
<td>Getting to know the literature</td>
<td>15</td>
</tr>
</tbody>
</table>
According to the Study Regulations of the Silesian University of Technology, attendance at the lecture is obligatory. Students can take the correction of the grade from the colloquium only twice.

The condition of passing the lectures is obtaining a positive grade from the colloquium. A student’s workload - fill in the types of activities, e.g. preparation for a course, interpretation of results, making a course report, preparing for an exam, studying sources, making a project, presentation and report, doing written assignment, etc.

- the student’s individual work

5. Summary indexes:

- number of course hours and ECTS credits at the course with a direct participation of academic teachers or other persons running the course and supervising students: 45 hours; 1.5 ECTS credits.
- number of course hours and ECTS credits at the course related to the scientific activity conducted at the Silesian University of Technology in a discipline or in disciplines to which a field of study is assigned - in the case of studies with a general academic profile: 45 hours; 1.5 ECTS credits.
- number of course hours and ECTS credits at the course developing practical skills - in the case of practical studies;
- number of course hours conducted by academic teachers employed by the Silesian University of Technology as their primary workplace: 45 hours.

6. Persons conducting particular modes of courses (name, surname, academic degree or degree in arts, title of professor, business e-mail address):

Lecture: Monika Sroka-Bizoń, dr inż. arch., monika.sroka-bizons@pohl.pl

Laboratory classes: Anita Pawlak-Jakubowska, dr inż., anita.pawlak-jakubowska@pohl.pl
   Monika Sroka-Bizoń, dr inż. arch., monika.sroka-bizons@pohl.pl

7. Detailed description of teaching modes:

1) Lectures:
   - detailed programme’s content:
   - teaching methods, including distance learning:
     Lecture conducted using multimedia techniques; lecture materials made available for students on the Remote Education Platform of the Laboratory of Geometry and Engineering Graphics of the Silesian University of Technology - course "Engineering graphics".
     Form and criteria for semester completion, including retake tests, as well as conditions for admission to the examination:
     The condition of passing the lectures is obtaining a positive grade from the colloquium. A negative grade from the colloquium can be corrected on the colloquium on the date set by the lecturer. Students can take the correction colloquium only twice.
   - lecture organisation and rules of participation in the lecture, with an indication whether a student’s attendance is obligatory
     According to the Study Regulations of the Silesian University of Technology, attendance at the lecture is not obligatory; however, it is advisable.

2) Description of other teaching modes:
   2.1) Laboratory classes:
   - detailed programme’s content:
     Introduction to technical drawing - basic rules, drawing lines etc. Freehand sketch. Technical drawing

- teaching methods, including distance learning:

  In conducting laboratory classes the following teaching methods are used:
  
  - Scaffolding - based on already acquired knowledge, skills and interests of the student, creative and critical thinking increases and encourages to take on more and more difficult challenges.
  - using of Visual aids - making the laboratory classes more attractive by using modern, interactive visual aids - on-line presentations of spatial models and models of geometric objects.
  - Active learning - by putting the greater emphasis on teamwork, the person conducted the laboratory classes acts as a moderator.
  - Authenticity - learning using real life situations - tasks of design works which are realized during laboratory classes are connected with civil engineering constructions.
  - by Multiple Focus - persons who conduct the laboratory classes present students integration between different subjects taught at Civil Engineering Faculty; by such multidisciplinary learning, students are supported with positive feelings related to the learning process.

As part of the laboratory classes, drawing design works are realized in which structural geometric problems are solved. The content of design works is based on the topics presented in lectures. Didactic materials for laboratory classes are made available to students on the Remote Education Platform of the Laboratory of Geometry and Engineering Graphics of the Silesian University of Technology.

- form and criteria for laboratory classes completion:

  The condition for passing the laboratory classes is to obtain positive grades from all project work carried out at the laboratories and design work carried out at home. A negative grade of the project work can be corrected by the correction of the design work. The date and form of the design work correction should be agreed with the person conducting the laboratories. The correction of the negative grade of the design work should take place as soon as possible.

  - laboratory classes organization and rules of participation in the laboratory classes, with an indication whether a student’s attendance is obligatory

Laboratory classes are compulsory. Absence at laboratory classes should be made up in the manner indicated by the person conducting the laboratory classes.

8. Description of the method for determining the final grade (rules and criteria for evaluation, as well as the final grade calculation method in the case of a course comprising more than one teaching mode, taking into account all teaching modes and all exam dates and credit tests including retake exams and tests):

To obtain a positive final grade of the course, it is required to obtain positive grades in lectures and laboratory classes. The lecture grade is determined on the basis of the colloquium grade. If it is necessary to correct the colloquium as a result of obtaining a negative grade, the lecture grade is determined on the basis of the average grade obtained.

\[ G_c = G_c \]

\[ G_l = \text{the lecture grade} \]

\[ G_c = \text{colloquium grade (possibly correction of the colloquium)} \]

The grade of the laboratory classes is determined on the basis of the average of partial grades from design work performed at the laboratory classes and design work performed at home.

\[ G_{LC} = \frac{(GW_L + GW_H)}{2} \]

\[ G_{LC} = \text{the laboratory classes’ grade} \]
\( G_{DL} \) - the average grade of the design works carried out during laboratory classes

\( G_{DWH} \) - the average grade of the design works realized at home

The final grade of the course is determined on the basis of grades from lectures and laboratory classes. The final grade is determined based on the average of the partial grades mentioned above.

\[ G = \left( \frac{G_L + G_{LC}}{2} \right) \]

- \( G \) - the final grade of the course
- \( G_L \) - the lecture grade
- \( G_{LC} \) - the laboratory classes’ grade

9. Method and procedure for making up for

- student’s absence from the course,
  A student absent from the classes of the course is required to make up for the backlog by doing the course’s class within the time limit indicated by the person conducted the course’s classes.
- differences in study programmes for students changing their field of study, changing university or resuming studies at the Silesian University of Technology,
  A student who has arrears due to differences in study programs is required to supplement them by participating in selected classes indicated by the person who conducted the course’s classes.

10. Prerequisites and additional requirements, taking into account the course sequence:

Mathematics, planimetry, Euclidean geometry, freehand drawing.

11. Recommended sources and teaching aids:

Basic literature

Supplementary literature

12. Description of teachers’ competences (e.g. publications, professional experience, certificates, trainings etc. related to the programme contents implemented as a part of the course):

Persons conducted the course have many years of experience in conducting courses of descriptive geometry, engineering geometry, engineering graphics, CAD methods and technical drawing. Monika Sroka-Bizoń is a practicing architect with full design and construction rights. Anita Pawlak-Jakubowska, construction engineer, in 2019 completed training as part of the European project ‘Raising the teaching competence of academic teachers in the field of innovative teaching methods - innovative teaching methods in English-language classes’.

Persons conducted the course are the authors of several dozen scientific publications in the field of architectural geometry, construction geometry, descriptive geometry, engineering graphics and construction drawing, including CAD methods; they are also authors of didactic publications.


13. Other information:

All disputing matters and issues not addressed in this document are regulated by the Study Regulations.