

| STUDY MODULE DESCRIPTION FORM | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of the module/subject Steel Structures | | Code 1010104161010110073 |
| Field of study Civil Engineering First-cycle Studies | Profile of study (general academic, practical) (brak) | Year /Semester 3 / 6 |
| Elective path/specialty - | Subject offered in: Polish | Course (compulsory, elective) obligatory |
| Cycle of study: First-cycle studies | Form of study (full-time, part-time) part-time | |
| No. of hours Lecture: 20 Classes: 10 Laboratory: - Project/seminars: 12 | | No. of credits 6 |
| Status of the course in the study program (Basic, major, other) (brak) | | (university-wide, from another field) (brak) |
| Education areas and fields of science and art | | ECTS distribution (number and %) |
| Responsible for subject / lecturer: dr inż. Marcin Chybiński email: marcin.chybinski@put.poznan.pl tel. 61 665 20 91 Wydział Budownictwa i Inżynierii Środowiska ul. Piotrowo 5, 60-965 Poznań | | Responsible for subject / lecturer: dr inż. Robert Studziński email: robert.studzinski@put.poznan.pl tel. 61 665 20 91 Wydział Budownictwa i Inżynierii Środowiska ul. Piotrowo 5, 60-965 Poznań |
| Prerequisites in terms of knowledge, skills and social competencies: | | |
| 1 | Knowledge | Knows the basic physical concepts as force, stress, strain, strength, knows the SI units, have basic knowledge in the field of structural mechanics and strength of materials in the area of ??study. |
| 2 | Skills | Converts algebraic and arithmetic, is fluent in mathematical analysis and used basic formulas in the field of structural mechanics and strength of materials. |
| 3 | Social competencies | Understand the need for lifelong learning and knows how to interact and work in a group. |
| Assumptions and objectives of the course: Gaining knowledge of the specific nature of the materials used in metal structures, technology and production process, material properties. In the frame of design of metal structures, learn the basic methods of connection's designing . | | |
| Study outcomes and reference to the educational results for a field of study | | |
| Knowledge: | | |
| 1. Knows the basics of technology used in the production of steel structure and their mechanical properties - [K1_W12] 2. Classifies grades of steels and steel elements depending on the required strength characteristics and technological conditions. It presents issues concerning corrosion protection and fire protection of steel structures - [K1_W12] 3. Identifies and characterizes types of welded and bolted connections and explains the calculation procedures - [K1_W07] | | |
| Skills: | | |
| 1. Able to choose the grade of steel according to the selected design elements - [K1_U07] 2. Able to take the appropriate design and technological solutions in the field of corrosion and fire protection - [K1_U07] 3. Propose a design solution of the connections using the appropriate calculation procedure - [K1_U07] | | |
| Social competencies: | | |
| 1. Understand the need for lifelong learning; able to inspire and organize the learning process of others - [K1_K06] 2. Able to interact and work in a group - [K1_K01] 3. Correctly identifies and resolves dilemmas associated to his profession - [K1_K07] | | |
| Assessment methods of study outcomes | | |

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <p>Evaluation of individual student projects combined with an oral defense of the thesis. Test in the exercises. Test in the lectures. The evaluation scale: Number of evaluation</p> <p>91%-100% very good (A) 81% - 90% good plus (B) 71% - 80% Good (C) 61% - 70% is sufficient plus (D) 51% - 60% satisfactory (E) insufficient under 50% (F)</p> | |
| Course description | |
| <p>Form of teaching: lecture</p> <p>Basic concepts and definitions for the design of metal structures. Types of steel used in construction and mechanical properties at natural and elevated temperatures. Corrosion of steel. Technology of production of steel and profiled steel. Assortment of hot-rolled, cold-rolled and welded members. Welded joints, technology of production and computational methods. Lap and butt screwed connections, design guidelines, technology, implementation and calculation algorithms. Design elements in compression and tension.</p> <p>Form of teaching: classes</p> <p>Examples of design of welded joints, the basic principles and methods of calculation. Examples of design of bolted joints, assumptions and analysis.</p> <p>Form of teaching: projects</p> <p>Project of selected welded and bolted joints.</p> | |
| <p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Bródka J., Kozłowski A., Projektowanie i obliczanie połączeń i węzłów konstrukcji stalowych t. 1, PWT, Warszawa, 2013 2. Bródka J., Kozłowski A., Projektowanie i obliczanie połączeń i węzłów konstrukcji stalowych t. 2, PWT, Warszawa, 2015 3. Kozłowski A., Konstrukcje stalowe, Część1 Wybrane elementy i połączenia, Wyd. Politechniki Rzeszowskiej, 2014 4. Goczek J., Supel Ł., Gajdzicki M., Przykłady obliczeń konstrukcji stalowych, Wyd. Politechniki Łódzkiej, 2013 5. Kurzawa Z., Chybiński M., Projektowanie konstrukcji stalowych, Wydawnictwo PP, Poznań, 2008 6. Łubiński M., Filipowicz A., Żółtowski W., Konstrukcje metalowe cz. I, Arkady, Warszawa, 2008 7. Łubiński M., Żółtowski W., Konstrukcje metalowe cz. II, Arkady, Warszawa, 2008 8. Biegus A., Nośność graniczna stalowych konstrukcji prętowych, Wyd. PWN, Warszawa, 1997 9. Bogucki W., Żybertowicz M., Tablice do projektowania konstrukcji metalowych, Arkady, Warszawa, 1996 | |
| <p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. PN-EN 1991 Eurokod 1 Podstawy projektowania konstrukcji i oddziaływania na konstrukcje. 2. PN-EN 1993 Eurokod 3 Projektowanie konstrukcji stalowych. 3. PN-90/B-03200 Konstrukcje stalowe. Obliczenia statyczne i projektowanie. 4. PN-EN 1991 Eurokod 1. Podstawy projektowania konstrukcji i oddziaływania na konstrukcje. 5. PN-EN 1993 Eurokod 3. Projektowanie konstrukcji stalowych. 6. PN-90/B-03200 Konstrukcje stalowe. Obliczenia statyczne i projektowanie. | |
| Result of average student's workload | |
| Activity | Time (working hours) |
| 1. Participation in lectures | 20 |
| 2. Participation in exercise classes | 8 |
| 3. Participation in design classes | 12 |
| 4. Complete (at home) works involved in the project | 35 |
| 5. Participation in the consultations of the exercise and design classes | 5 |
| 6. Preparing to the test in the field of lectures | 25 |
| 7. Preparing to the test in the field of exercise classes | 25 |
| Student's workload | |

| Source of workload | hours | ECTS |
|---------------------------|--------------|-------------|
| Total workload | 150 | 6 |
| Contact hours | 47 | 2 |
| Practical activities | 50 | 2 |