



Subject card

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|---|--|--|---|------------|------------|--|-----|
| Subject name and code | Design of Welded Structures, PG_00040094 | | | | | | |
| Field of study | Mechanical Engineering | | | | | | |
| 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 | Part-time studies | Mode of delivery | | | | at the university | |
| Year of study | 3 | Language of instruction | | | | Polish | |
| Semester of study | 6 | ECTS credits | | | | 4.0 | |
| Learning profile | general academic profile | Assessment form | | | | exam | |
| Conducting unit | Department of Materials Engineering and Bonding -> Faculty of Mechanical Engineering and Ship Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Grzegorz Rogalski | | | | |
| | Teachers | | dr hab. inż. Grzegorz Rogalski | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 22.0 | 0.0 | 15.0 | 0.0 | 0.0 | 37 |
| | 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 | 37 | 10.0 | | 53.0 | 100 | |
| Subject objectives | To acquaint students with deepened information on the performance characteristics of the weldment and the formation of welded joints under the influence of static and dynamic loads. The student is able to apply different methods of dimensioning complex structures, working in various environmental conditions. Can also based on an analysis of weldability choose in a systemic way the material for welded structures. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | | Method of verification | |
| | [K6_U09] is able to plan the manufacturing, assembly and quality control processes of typical constructions and mechanical devices, estimating their costs | | On the basis of the information obtained, the student is able to plan the stages of manufacturing steel structures and estimate the initial production costs. | | | [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information | |
| | [K6_W08] possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle | | On the basis of the information obtained, the student is able to adapt the existing tools and acquired skills to solve the construction problem | | | [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge | |
| | [K6_W11] possesses knowledge on design, technology and manufacturing of machine parts, metrology, and quality control; knows and understands methods of measuring and calculating basic values describing the operation of mechanical systems, knows basic calculating methods applied to analyse the results of experiments | | The student is able to combine the aspects of construction, technology and quality control in relation to the production of steel structures. | | | [SW2] Assessment of knowledge contained in presentation | |
| Subject contents | Basic concepts and definitions concerning the strength of materials in relation to the welded joints. Elastic and plastic deformation of the material under external load. Types of breakthroughs. Relations between the state of stress and strain. Effects of temperature and type of load on the behavior of the material. Basic principles for the design of welded structures: the method of calculating the stress equilibrium conditions, geometric conditions, compounds physical stress permissible. Characteristics of types of stress: tensile, shear stress, tension membrane formation conditions of stress concentration, multi-axis stress state. Calculation of complex structural design contains butt and fillet welds | | | | | | |
| Prerequisites and co-requisites | Basic knowledge of metallurgy, mechanics and strength of materials. | | | | | | |

| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
|--|--------------------------|--|-------------------------------|
| | written exam | 50.0% | 70.0% |
| | laboratory | 100.0% | 30.0% |
| Recommended reading | Basic literature | 1. K. Ferenc, J. Ferenc: Projektowanie konstrukcji spawanych" WNT W-wa 2002 - Design of welded structures - in Polish 2. Poradnik inżyniera - Spawalnictwo - T 1, WNT W-wa 2003/ Welding handbook Part one - in Polish 3. J. Augustyn, E Śledziewski: Technologiczność konstrukcji stalowych Arkady W-wa 1981- Producibility of steel construction - in Polish 4. M. Porębska, A. Skorupa: Połączenia spójnościowe, Wyd. Naukowe PWN W-wa 1997 - Welding design - in Polish | |
| | Supplementary literature | Technical Journals: 1. Welding Journal 2. Metallurgical Transaction A, B 3. Transaction of ASME | |
| | eResources addresses | | |
| Example issues/ example questions/ tasks being completed | | | |
| Work placement | Not applicable | | |