

MODULE SPECIFICATION

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|---------------------------------------|-------------------------------|
| Module code | |
| Module title in Polish | Konstrukcje metalowe 2 |
| Module title in English | Metal Structures 2 |
| Module running from the academic year | 2016/2017 |

A. MODULE IN THE CONTEXT OF THE PROGRAMME OF STUDY

| | |
|---|---|
| Field of study | Civil Engineering |
| Level of qualification | First cycle <i>(first cycle, second cycle)</i> |
| Studies profile | Academic <i>(academic/practical)</i> |
| Mode of study | Full-time <i>(full-time / part-time)</i> |
| Specialism | |
| Organisational unit responsible for module delivery | The Department of Mechanics, Metal Structures and Computer Methods |
| Module co-ordinator | Monika Siedlecka, MSc, Eng. |
| Approved by | Marek Iwański, Professor |

B. MODULE OVERVIEW

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|--|--|
| Module type | Core module <i>(core/programme-specific/elective HES*)</i> |
| Module status | Compulsory module <i>(compulsory / non-compulsory)</i> |
| Language of module delivery | English |
| Semester in the programme of study in which the module is taught | Semester 6 |
| Semester in the academic year in which the module is taught | Summer semester <i>(winter / summer)</i> |
| Pre-requisites | None <i>(module code/module title, where appropriate)</i> |
| Examination required | Yes <i>(yes / no)</i> |
| ECTS credits | 3 |

| Mode of instruction | lectures | classes | laboratories | project | others |
|---------------------------------|-----------|---------|--------------|-----------|--------|
| Total hours per semester | 30 | | | 15 | |

* elective HES – elective modules in the Humanities and Economic and Social Sciences

C. LEARNING OUTCOMES AND ASSESSMENT METHODS

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|--------------------|---|
| Module aims | The aim of the module is to acquire the skills of shaping and design of steel constructional elements (as well as their joints). Other aims include: preparing the drawings of steel structures and designing simple structures of steel civil engineering. |
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| Module outcome code | Module learning outcomes | Mode of instruction (l/c/lab/p/ others) | Corresponding programme outcome code | Corresponding discipline-specific outcome code |
|---------------------|--|---|--------------------------------------|---|
| W_01 | A student knows basic norms, standards as well as designing guidelines of building objects and their elements. | l/p | B_W08 | T1A_W03 T1A_W07 T1A_W08 |
| W_02 | A student knows the fundamentals of designing and constructing building metal and compound structures. | l/p | B_W09 | T1A_W03 T1A_W07 |
| U_01 | A student can classify building objects, bearing structures of constructions and the elements of constructional systems; a student can also compare loads interacting on building objects. | l/p | B_U02 B_U03 | T1A_U08 T1A_U11 T1A_U13 |
| U_02 | A student can utilise basic norms, directives as well as guidelines as regards designing building objects and their elements. | l/p | B_U13 | T1A_U05 T1A_U07 T1A_U11 T1A_U15 T1A_U16 |
| U_03 | A student can design simple building structures and the selected elements of metals and compound structures. A student also can make assembly drawings. | l/p | B_U09 B_U14 | T1A_U03 T1A_U04 T1A_U05 T1A_U07 T1A_U09 T1A_U05 T1A_U13 T1A_U14 T1A_U16 |
| K_01 | A student can work individually. | p | B_K01 | T1A_K01 T1A_K03 T1A_K04 |
| K_02 | A student understands the significance of his/her responsibility in engineering practice, including the reliability of the presented results of his/her work (and their interpretation). | p | B_K02 | T1A_K02 T1A_K05 T1A_K07 |
| K_03 | A student is aware of the necessity of raising his/her professional competences. | p | B_K03 | T1A_K01 T1A_K05 T1A_K07 |

Module content:

1. Topics to be covered in the lectures

| No. | Topics | Module outcome code |
|-----|---|----------------------|
| 1 | General characteristics of industrial halls. Basic dimensions of halls. Constructional elements. The loads of halls. | W_01 |
| 2-3 | General stability of constructional systems. The conditions of supporting a compressed bars. Imperfection loads. The concentrations of halls composed of flat section systems. Concentration types. The principles of distribution. Design of bracings. | W_02 U_01 U_13 |
| 4-5 | Types of purlins. Purlin hanger. Design principles. Supporting purlins on the steel transom. | W_02 |

| | | |
|-------|---|------------------------------|
| 6-8 | Truss girders. Types of trusses. General principles of constructing them. Buckling length values of truss bars in the case of buckling in the plane and from the plane of truss. Designing bars. Constructing nodes and designing joints in nodes. Assembly contacts and support nodes. | W_01 W_02 U_13 U_14 |
| 9-10 | Columns halls. Interaction curves on the basis of an eccentrically loaded column. Designing the stem of column. Column heads. Supports of crane beam footing. Column bases: fixing with screws, the foots of foundation cup alloys, and two-piece alloys. | W_01 W_02 U_13 U_14 |
| 11-12 | Crane beams. Loads. Designing and calculating beam sections. Designing longitudinal braces. Constructional recommendations. Support nodes of beams and assembly joints. Suspended hoisting crane beams. Calculating and constructing. | W_01 W_02 |
| 13-14 | The fundamentals of compound steel and concrete structures. | W_01 W_02 |
| 15 | Corrosion and fire protection. | W_01 |

2. Topics to be covered in the classes
3. Topics to be covered in the projects

| Project number | Topics | Module outcome code |
|----------------|---|--|
| 1 | Preparing an assembly drawing of a steel structure concerning an industrial hall. Execution of the envelope section forces and checking the load bearing capacity of selected structural elements of the hall. Preparing workshop drawings of a truss and a column. | W_01 W_02 U_01 U_02 U_03 K_01 K_02 K_03 |

Assessment methods

| Module outcome code | Assessment methods <i>(Method of assessment; for module skills – reference to specific project, laboratory and similar tasks)</i> |
|---------------------|--|
| W_01 | An examination and a project |
| W_02 | An examination and a project |
| U_01 | An examination and a project |
| U_02 | An examination and a project |
| U_03 | An examination and a project |
| K_01 | An examination and a project |
| K_02 | An examination and a project |
| K_03 | An examination and a project |

C. STUDENT LEARNING ACTIVITIES

| ECTS summary | | |
|--------------|---|-----------------------------|
| | Type of learning activity | Study time/ credits |
| 1 | Contact hours: participation in lectures | 30 |
| 2 | Contact hours: participation in classes | |
| 3 | Contact hours: participation in laboratories | |
| 4 | Contact hours: attendance at office hours (2-3 appointments per semester) | 1 |
| 5 | Contact hours: participation in project-based classes | 15 |
| 6 | Contact hours: meetings with a project module leader | 2 |
| 7 | Contact hours: attendance at an examination | 2 |
| 8 | | |
| 9 | Number of contact hours | 50 <i>(total)</i> |
| 10 | Number of ECTS credits for contact hours <i>(1 ECTS credit =25-30 hours of study time)</i> | 2 |
| 11 | Private study hours: background reading for lectures | 5 |
| 12 | Private study hours: preparation for classes | |
| 13 | Private study hours: preparation for tests | |
| 14 | Private study hours: preparation for laboratories | |
| 15 | Private study hours: writing reports | |
| 16 | Private study hours: preparation for a final test in laboratories | |
| 17 | Private study hours: preparation of a project/a design specification | 17 |
| 18 | Private study hours: preparation for an examination | 5 |
| 19 | | |
| 20 | Number of private study hours | 27 <i>(total)</i> |
| 21 | Number of ECTS credits for private study hours <i>(1 ECTS credit =25-30 hours of study time)</i> | 1 |
| 22 | Total study time | 77 |
| 23 | Total ECTS credits for the module <i>(1 ECTS credit =25-30 hours of study time)</i> | 3 |
| 24 | Number of practice-based hours <i>Total practice-based hours</i> | 35 |
| 25 | Number of ECTS credits for practice-based hours <i>(1 ECTS credit =25-30 hours of study time)</i> | 1.4 |