

Course code: .....

Plan position: .....

### A. INFORMATION ABOUT THE COURSE

#### B. Basic information

Name of course	METAL STRUCTURES
Field of studies	Civil Engineering
Level of studies	Bachelor's degree
Profile of studies	general academic
Form of studies	full-time (weekdays)
Specialty	
Unit responsible for the field of studies	Faculty of Civil and Environmental Engineering and Architecture
Name and academic degree of teacher(s)	Dr inż. Rafał Tews, mgr inż. Tomasz Lamparski
Introductory courses	
Introductory requirements	

#### C. Semester/week schedule of classes

Semester	Lectures (W)	Auditorium classes (Ć)	Laboratory classes (L)	Project classes (P)	Seminar (S)	Field classes (T)	Number of ECTS points
2	30						6

### 2. LEARNING OUTCOME

No.	Learning outcomes description	The reference to the learning outcomes of specific field of study	The reference to the learning outcomes for the area
<b>KNOWLEDGE</b>			
W1	has a structured and theoretically underpinned basic knowledge of steel properties, the range of elements and steel products, modelling, construction and calculation of welded and bolted joints of steel elements, determination of the basic resistance of steel sections	K_W15	P6S_WG
W2	has a structured and theoretically sound knowledge of the construction and dimensioning of steel beams from rolled sections and plates, steel columns and trusses	K_W15	P6S_WG
<b>SKILLS</b>			
U1	is able to carry out the analysis of calculations of welded and bolted joints and basic cross-sectional load capacities on its own	K_U19	P6S_UW
U2	is able to carry out static calculations of statically determinable and non-quantifiable elements	K_U19	P6S_UW

SOCIAL COMPETENCES			
K1	is aware of the probabilistic nature of the work of steel and engineering structures	KK_09	P6S_KK
K2	is aware of the responsibility for the effects of the adopted design and engineering solutions in terms of the safety of the designed and constructed building and its impact on the natural environment	KK_07	P6S_KK, P6S_KO, P6S_KR

### 3. TEACHING METHODS

#### A. Traditional methods used \*\*\*

multimedia lecture, calculation examples
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#### B. Distance learning methods used \*\*\*

<p><b>Synchronous method</b> (classes conducted in a way that ensures direct interaction between the student and the teacher in real time, enabling immediate flow of information, the method can be used only if it is provided for in the study plan for a given cycle of education): remote lecture in the form of videoconference</p>
<p><b>Asynchronous method</b> used as an auxiliary (a method that does not ensure direct interaction between the student and the teacher in real time, used only as an auxiliary / complementary method):  online educational videos, online multimedia presentations,</p>

### 4. METHODS OF EXAMINATION

colloquium
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### 5. SCOPE

Lectures	theoretical basis for the dimensioning of welded joints and overlapping bolt connections, issues of section class, design section resistances in simple and complex load states, dimensioning examples of welded and overlapping bolted joints, Bending element torsional buckling, construction and dimensioning of hot-rolled beams, beam supports, Class 4 local wall instability, construction and dimensioning of plate girders, ribbing of plate girders, beam to string connections, buckling of compressed elements, construction and dimensioning of solid and multi-branch columns, column heads and bases, construction and dimensioning of flat trusses
Laboratories	

### 6. METHODS OF VERIFICATION OF LEARNING OUTCOMES

LEARNING OUTCOME	Form of assessment					
	Oral examination	Written exam	Colloquium	Project	Presentation	.....
W1			x			
W2			x			
U1			x			
U2			x			
K1			x			
K2			x			

### 7. LITERATURE

Basic literature	<ol style="list-style-type: none"> <li>1. Ziółko J, Giżejowski M., 2010, General construction t.5. Design according to Eurocodes with calculation examples, Arkady</li> <li>2. Kozłowski A., 2010, Steel Structures. Examples of calculations according to PN-EN1993-1-1. Part 1, Selected elements and connections, OWPRz</li> <li>3. Kozłowski A., 2011, Steel Structures. Examples of calculations according to PN-EN 1993-1-1. Part 2, Ceilings and platforms, OWPRz</li> <li>4. Trahair N.S., 2008, The behaviour and design of steel structures to EC3, Taylor &amp; Francis</li> </ol>
Supplementary literature	<ol style="list-style-type: none"> <li>1. Rykaluk K., 2016, Metal structures. Part 1, DWE</li> <li>2. Goczek J., 2013, Examples of steel structure calculations, PŁ</li> </ol>

**8. TOTAL STUDENT WORKLOAD REQUIRED TO ACHIEVE EXPECTED LEARNING OUTCOMES EXPRESSED IN TIME AND ECTS CREDITS**

Student's activity		Student workload– number of hours
Classes conducted under a direct supervision of an academic teacher or other persons responsible for classes	Participation in classes indicated in point 1B	30
	Supervision hours	10
Student's own work	Preparation for classes	40
	Reading assignments	50
	Other (preparation for exams, tests, carrying out a project etc)	50
Total student workload		180
Number of ECTS points		6