CZESTOCHOWA UNIWERSITY OF TECHNOLOGY
FACULTY OF CIVIL ENGINEERING
DEPARTMENT OF BUILDING AND ENGINEERING STRUCTURES
CARD OF DESCRIPTION COURSE

Name of course						Code of course	Year / Semester	
Timber structures *Konstrukcje drewniane*						**WB_BUD_D_II_KDR_02**	**I**	**2**
Type of course						**Level of qualification**	**ECTS**	
Lecture	**Practice**	**Laboratory**	**Design**	**Seminar**	**Exam**	Stationary second cycle programme		
2	**-**	**-**	**2**	**-**	**-**	**S2**	**6**	
Specialities:						**Type of course:**		
• **Building and Engineering Structures** • **Technology, Organization and Management in Construction** • **Architecture in Construction**						**obligatory**		
Unit administrating study:						***DEPARTMENT OF BUILDING AND ENGINEERING STRUCTURES***		
						Room 94	***tel./fax: +48 (34) 325 09 24***	
Study language:						**Polish / English**		
Person leading of course:						**Dr Eng. Roman GĄĆKOWSKI**	**rgack@wp.pl**	

I. CARD OF COURSE	
OBJECTIVE OF THE SUBJECT	
C1	Understanding the essence of timber structures as engineering.
C2	Acquires the design skills and calculation of bearing capacity of advanced cross sections timber elements by ULS and SLS.
C3	Design of timber structures using the acquired knowledge in the field of engineering with a full-time first degree.
PREREQUISITES FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCE	
1	Basic knowledge of general construction and mechanics theory.
2	Basic knowledge of theoretical mechanics and strength of materials and the ability of calculating the ratios of strength sections.
3	Messages from structural mechanics and ability to solve advanced static systems.
4	Knowledge of mechanics and foundations soil timber structures.
5	Ability to use standard EC0, EC1, EC5 and professional literature.
6	Knowledge of and ability to use the software for the calculation of static and durability of building structures and engineering.
LEARNING OUTCOMES	
EK1	has an orderly, theoretically founded general knowledge necessary to understand advanced work of timber construction.
EK2	has a detailed knowledge useful for solving advanced engineering tasks in the field of timber construction.
General skills	
EK3	the student is able obtain information from the literature and other materials, including catalogs of manufacturers of components for timber structures in the Polish and English language.
EK4	the student able to individually solve advanced tasks.
Fundamental engineering skills	
EK5	the student able to use computer programs to perform advanced calculation models of timber structures.
Skills directly related to solving an engineering tasks	
EK6	the student able to correct an analysis advanced work of timber structures and on this fundamentals to determine the scope of the calculation.

Competence of personal and social	
EK7	the student able to think and act creatively and systematically doing the design of a timber structures.

CONTENTS OF COURSE		
Form of teaching – Lectures		**Number of hours**
W01	History of timber structures	2
W02	Wood properties	2
W03	Structural timber	2
W04	Glued laminated timber	2
W05	Wood based panels	2
W06	Design of timber structures – Serviceability Limit States	2
W07	Design of timber structures – Ultimate Limit States	2
W08	Design of timber structures according to Eurocode 5	2
W09	Design of timber built-up columns	2
W10	Joints in timber structures	2
W11	Planar timber structures	2
W12	Spatial timber structures	2
W13	Bracings of timber structures	2
W14	Durability of timber structures	2
W15	Fire resistance of timber structures	2
	TOTAL:	**30**

Form of teaching – Design		Number of hours
Pr01	Introduction to use of standards and regulations.	2
Pr02	Edition theme of the design. The work schedule.	2
Pr03	Summary of loads. Finding the element dimensions of timber structures.	4
Pr04		
Pr 05	The construction of calculation models. Static calculations.	6
Pr 06		
Pr 07		
Pr 08	Strength calculation of timber elements based on static calculations.	4
Pr 09		
Pr 10	Calculation of bearings and expansion joints of timber structures.	2
Pr 11	The preparation of complete documentation of the design descriptive.	4
Pr 12		
Pr 13	Preparation of complete technical drawings of the design.	4
Pr 14		
Pr 15	Assessment of the design.	2
	TOTAL:	**30**

TOOLS OF TEACHING	
1.	Lecture: presentation of multimedia content lectures.
2.	Design: multimedia presentation, discussion.
3.	Materials copyright lecturers. Consultation. Literature. Standards of work timber structures EC0, EC1, EC5
4.	Software for the calculation of static and strength of engineering structures.

METHODS OF ASSESSMENT: (F - FORMATIVE; P - SUMMARY)	
F1	Assessment independently prepare for classes.
F2	Assessment of the implementation of the design outside the classroom.

P1	Assessment develop a calculation model of the timber structures.
P2	Assessment of analysis results of calculations internal forces and combinatory of loads.
P3	Assessment of the implementation documentation descriptive and graphic of the timber structures.

WORKLOAD OF STUDENT			
O.n.	**Activity**	**Average number of hours/ECTS to complete the activity**	
		[hours.]	**[ECTS]**
1.	Hours of classes organized by the universities - **Lectures**.	**30**	**6**
2.	Contact hours of teacher connected with lectures.	30	
3.	Introduction to with the indicated literature.	30	
4.	Hours of classes organized by the universities - **Design**.	**30**	
5.	Contact hours of teacher connected with design.	30	
6.	Implementation of the design.	30	
	TOTAL:	**180**	

BASIC AND SUPPLEMENTARY LITERATURE	
1.	Kotwica J.: *Konstrukcje drewniane w budownictwie tradycyjnym*. Arkady. Warszawa 2006.
2.	Larsen H., Vahik E.: *Practical design of timber structures to Eurocode 5*. Thomas Telford Limited. London 2009.
3.	Leonardo da Vinci Pilot Projects*. Educational Materials for Designing and Testing of Timber Structures* – TEMTIS. Handbook 1 – Timber Structures. September 2008
4.	Leonardo da Vinci Pilot Projects. *Educational Materials for Designing and Testing of Timber Structures* – TEMTIS. Handbook 2 – Timber Structures according to EC 5. October 2008
5.	Mielczarek Z.: *Budownictwo drewniane*. Arkady. Warszawa 1994.
6.	Neuhaus H.: *Budownictwo drewniane*. PWT. Rzeszów 2008.
7.	Nożyński W.: *Przykłady obliczeń konstrukcji budowlanych z drewna*. WSiP. Warszawa 1994.
8.	Porteous J., Ross P.: *Designers' Guide to Eurocode 5: Design of Timber Buildings. EN 1995-1-1.* Series editor Haig Gulvanessian CBE. Thomas Telford Limited. London 2013.
9.	PN-EN 1995-1-1 kwiecień 2010. Eurokod 5. Projektowanie konstrukcji drewnianych. Część 1-1: Postanowienia ogólne. Reguły ogólne i reguły dotyczące budynków.
10.	PN-EN 338 styczeń 1999. Drewno konstrukcyjne. Klasy wytrzymałości.
11.	PN-EN 1194 listopad 2000. Konstrukcje drewniane. Drewno klejone warstwowo. Klasy wytrzymałości i określenie wartości charakterystycznych.
12.	EN 1995-1-1: Eurocode 5: *Design of timber structures – Part 1-1: General – Common rules and rules for buildings.*

MATRIX OF IMPLEMENTATION EFFECTS OF EDUCATION FOR DIRECTION					
The effect of learning	**The reference given effect to the effects defined for the entire program (PEK)**	**Objectives of the course**	**Program content**	**Tools of teaching**	**Method for assessing**
EK1	KBI_W02	C1, C2, C3	W01÷W06, W08÷W09 Pr01÷Pr03	1, 2, 3	F1, F2, P3
EK2	K_W07, K_W13	C1, C2, C3	W07÷W15, Pr01÷Pr03	1, 2, 3	F1, F2, P3
EK3	K_U02, K_U03	C1, C2, C3	W01÷W02, W05÷W15, Pr01÷Pr10, Pr14÷Pr15	1, 2, 3	F1, F2, P1, P2
EK4	K_U07, K_U18	C2, C3	Pr03÷Pr05, Pr07, Pr09	2, 3, 4	P1, P2, P3
EK5	K_K01	C2, C3	Pr05÷Pr12	2, 3, 4	P2, P3
EK6	K_K07	C2, C3	Pr05÷Pr12	2, 3, 4	P2, P3
EK7	K_K08	C2, C3	Pr02÷Pr04, Pr11÷Pr15	2, 3, 4	P1, P2, P3

II. METHODS OF ASSESSMENT – DETAILS	
MARKS	**LEARNING OUTCOME**
	EK-01
2,0	The student knows only the basic terms relating to timber and has a cursory knowledge of dimensioning of timber structures.
3,0	The student completed the knowledge of new terminology and symbols for the construction of timber and general knowledge of advanced methods for modeling timber structures.
3,5	The student can explain in further detail the work of any of the timber structures and the loads acting on them. He knows the advanced part modeling timber structures.
4,0	The student can explain in further detail the work of any of the timber structures and the loads acting on them. He knows the advanced methods of modeling design.
4,5	The student is able to partially put into practice designed timber structures using advanced computational methods and partly to identify environmental hazards, know methods to prevent their effects.
5,0	The student is able to use it in practice timber designed using advanced computational methods and identify environmental hazards, know methods to prevent their effects.
	EK-02
2,0	The student knows the principles of modeling and briefly the work of individual elements of timber structures.
3,0	The student knows the principles of modeling and operation of components of timber structures but has trouble with their interpretation, knows the rules of dimensioning briefly in timber structures.
3,5	Can partially correctly perform and interpret advanced computational models of timber structures and to determine their application, knows the rules of dimensioning individual components of timber structures.
4,0	Able to properly perform and interpret advanced computational models of timber structures and to determine their application, knows the rules of dimensioning individual components of timber structures.
4,5	The student knows the partially advanced principles and objectives of the calculation of timber structures by ULS and SLS, and understand their importance.
5,0	Advanced student knows in detail the principles and objectives of timber structures by calculating the ULS and SLS, and understand their importance.
	EK-03
2,0	The student knows the basic sources of literature needed for the design of timber structures.
3,0	The student knows the applicable standards and can use them in the design (EC0, EC1, EC5).
3,5	The student is able to partially take advantage of all standards and link them throughout the process of design of timber structures (EC0, EC1, EC5).
4,0	The student is able to use all of the standards and link them throughout the process of design of timber structures (EC0, EC1, EC5).
4,5	Moreover the student completed message in the standards of knowledge given in the literature but can't fully exploit it.
5,0	Moreover the student completed message in the standards of knowledge given in the literature.
	EK-04
2,0	The student are unable to perform work on the design and don't know the advanced methods of calculation of timber structures.
3,0	The student is able to provide a general outline of the design, requires the control to the design at the initial stage, he can partially perform advanced computational models of timber structures.
3,5	The student is able to partially identify the issues made in implementing the design, but not able to use the recommendations of code. Able to perform partial advanced computational models.
4,0	Moreover the student is able to identify complex issues in implementing the design, but not able to use the recommendations of code. He can perform advanced computational models.
4,5	The student is able to identify the issues advanced in implementing the design, but it can't fully utilize the recommendations of code.
5,0	The student is able to identify the issues advanced in implementing the design and is able to use the recommendations of code.

EK-05	
2,0	The student isn't aware of what to create the correct procedures and computational models.
3,0	The student can build procedures and computational models but has difficulty in asking loads on structures.
3,5	The student is able to partially build procedures and computational models of the timber structure. He can ask properly load on structures. Has difficulty in interpreting the results of static calculations.
4,0	The student can build procedures and computational models of the timber structure. He can ask properly load on structures. Has difficulty in interpreting the results of static calculations.
4,5	The student can individually build advanced procedures and computational models, ask properly load but has trouble performing the correct analysis of the results of static.
5,0	The student can individually build advanced procedures and computational models, ask properly load and perform static analysis of the results.
EK-06	
2,0	The student doesn't understand the specifics of the construction of timber structures.
3,0	The student is able to identify and understand some technical issues occurring in the design.
3,5	The student identifies and partially understand the technical issues occurring in the design.
4,0	The student identifies and understands the technical issues occurring in the design.
4,5	The student is able to partially fix addition compounds with the work of construction.
5,0	The student is able to establish relationships in addition to the work of construction.
EK-07	
2,0	The student performs tasks assigned to him carelessly without the commitment and with delay.
3,0	The student performs tasks with commitment, on time but the share classes is passive.
3,5	Moreover the student actively participates in the activities but it isn't creative.
4,0	Moreover the student takes an active part in the activities and partly creative.
4,5	Moreover the student takes an active part in classes and being creative.
5,0	Moreover the student shows creativity and originality.

III. OTHER USEFUL INFORMATIONS ABOUT THE COURSE	
1.	Information where the student can see the presentations to classes, support materials and literature:
	According to the type of materials - in the classes didactic, in the room of teacher, in the library of the university and faculty.
2.	Information on the place of event classes:
	Showcased at the Faculty of Civil Engineering, Faculty of Civil Engineering website.
3.	Information on the date of the course (day of week / time):
	Showcased at the Faculty of Civil Engineering, Faculty of Civil Engineering website.
4.	Information on the consultation (hours + location):
	The timetable posted on the door of Room 89 at the Faculty of Civil Engineering at. Academic 3 (third floor).