Course code B.5.5. **Course item** ……

1. INFORMATION ABOUT THE COURSE

A. Basic information

Course title	Concrete structures
Field of study	Computer Aided Engineering
Cycle	*Second*
Study profile	*Academic*
Study mode	*Full-time*
Specialisation	*Not relevant*
Unit responsible for the field of study	*Faculty of Mechanical Engineering*
Lecturer	*Dr inż. Maciej Dutkiewicz*
Introductory courses	*Mechanics, strength of materials, construction mechanics, civil engineering*
Prerequisites	*Basic construction mechanics*

B. Semester/ weekly timetable

Semester	Lectures	Classes	Laboratories	Project classes	Seminars	Field experience	ECTS credits
I	30	15	-	-	-	-	4

LEARNING OUTCOMES (acc. to National Qualifications Framework)

No.	Description of learning outcomes	Reference to learning outcomes for the field of study	Reference to learning outcomes for the area of study
KNOWLEDGE			
K1	They have detailed knowledge of information technology, especially computer programming and computer graphics, They understand the problems of cooperation, including the exchange of data between different computer-aided environments; know how to solve these problems	CAE_W01 CAE_W07	T2A_W02 T2A_W04, T2A_W05
K2	They are familiar with computational methods useful in modeling facilities and technical equipment	CAE_W02	T2A_W03, T2A_W07
K3	They are familiar with 3D modeling software and technical documentation They have knowledge necessary to understand the economic and legal aspects of engineering	CAE_W03 CAE_W09	T2A_W04, T2A_W05 T2A_W08, T2A_W10, T2A_W11

SKILLS			
S1	They can create numerical models of processes and systems of technical objects and spatial	CAE_U01	T2A_U09, T2A_U17
S2	They are able to simulate the behavior of objects and technical devices with computer-aided tools, and on this basis can propose improvements to existing structures and systems	CAE_U02	T2A_U09, T2A_U16, T2A_U17
S3	They are able to design 3D geometric models of buildings and technical equipment with computer-aided tools	CAE_U03	T2A_U02, T2A_U07, T2A_U19
SOCIAL COMPETENCES			
SC1	They understand the need for learning throughout life	CAE_K01	T2A_K01
SC2	They understand the effects of non-technical aspects and engineering activities, including their impact on the environment	CAE_K02	T2A_K02
SC3	They are able to interact and work in a group, taking in the different roles	CAE_K03	T2A_K03

2. TEACHING METHODS

Multimedia lecture, presentation, discussion, case study,

2. METHODS OF EXAMINATION

Oral and written exam, colloquium

3. COURSE CONTENT

Lectures	provide training in the design, analysis and assessment of concrete structures including computer software support. Theory of concrete and r-c elements
Classes	Exercises in modeling of r-c structures.

4. VALIDATION OF LEARNING OUTCOMES

(Each learning outcome from the list requires validation methods to ensure that it was achieved by a student.)

Learning outcome	Form of assessment (for example:)					
	Oral examination	Written examination	Colloquium	Project	Report	……
K1	x	x	x			
K2	x		x			
K3		x				
S1		x	x			
S2		x				
S3		x				
SC1			x			
SC2		x				
SC3		x	x			

5. LITERATURE

Basic literature	Design codes Computational modelling of concrete structures: proceedings of the EURO-C Conference 2003, St. Johann im Pongau, Austria, 17-20 March 2003

	Nilson, Arthur H; Darwin, David; Dolan, Charles W. , Design of concrete structures, 2010, 14th ed. in SI units., ISBN 0071311394, XVII, [3], 795
Supplementary literature	Łapko A., Jensen B.C., 2005, Podstawy projektowania i algorytmy obliczeń konstrukcji żelbetowych, Arkady.

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

Student's activity	Student workload– number of hours (for example:)
Participation in classes indicated in point 2.2	45
Preparation for classes	13
Reading assignments	30
Other (preparation for exams, tests, carrying out a project etc)	30
Total student workload	118
Number of ECTS credits allocated by the lecturer	**4**
Final number of **ECTS credits (determined by the Programme Council for the Field of Study)**	4