

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Flexibility in Engineering Design		Code 1010112111010105658
Field of study Civil Engineering	Profile of study (general academic, practical) general academic	Year /Semester 1 / 1
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 15 Classes: 15 Laboratory: - Project/seminars: -		No. of credits 3
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art		ECTS distribution (number and %)
Responsible for subject / lecturer: Richard de Neufville email: ardent@MIT.EDU tel. 001 617-253-1101 (3-1101) -MIT -Boston USA		Responsible for subject / lecturer: Piotr Nowotarski email: piotr.nowotarski@put.poznan.pl tel. 616652113 Wydział Budownictwa i Inżynierii Środowiska ul. Piotrowo 5 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Knowledge of basic techniques of execution of works in the traditional way
2	Skills	The ability to use a computer. The ability to use the Internet. Ability to work in a group.
3	Social competencies	Collaboration in a team to implement the project. Presenting a group of co-workers to perform tasks.
Assumptions and objectives of the course: Knowledge of the principles of building flexible in the construction process. Enabling the design of the construction process in order to optimize production costs and use of the building over the life of the building.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Have knowledgeable about doing business in the construction industry. Understand the principles of financial management companies - [K_W11] 2. Knowledgeable about infrastructure management in the full life cycle of the objects. - [K_W19] 3. Knows and applies the provisions of construction law - [K_W17]		
Skills: 1. Is able to carry out risk analysis in the implementation of projects and operation of buildings and implement appropriate measures and safety. Able to develop standards and norms of work and quality management procedures. - [K_U12] 2. It has the ability to communicate in foreign languages, including technical knowledge of the language elements of construction - [K_U14] 3. Student can make the development of preparing him to undertake scientific work - [K_U18]		
Social competencies: 1. Can carry out certain tasks to work independently, to work in a team and manage a team. - [K_K01] 2. Student is responsible for the accuracy of the results of their work and an assessment of the work under his team - [K_K02] 3. Student can complement and extends knowledge of modern processes and technologies in construction - [K_K03]		
Assessment methods of study outcomes		

Activity classes Defense project Final test project The final exam		
Course description		
Principle of flexibility in the design Flexibility in use A flexible approach to the construction process Examples of the use of flexibility in the construction of the world the concept of NPV and Global Market		
Basic bibliography: 1. Flexibility in Engineering Design, Richard De Neufville, Stefan Scholtes 2. Materiały szkoleniowe udostępnione na portalu moodle		
Additional bibliography: 1. Browne, J. et al. „Classification of flexible manufacturing systems”, The FMS Magazine 1984 April, 2. Engineering Design: A Systematic Approach, Gerhard Pahl, W. Beitz, Jörg Feldhusen, Karl-Heinrich Grote 3. Project Management Institute, A Guide to the Project Management Body of Knowledge (PMBOK Guide), Fifth Edition		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in seminars / exercises	15	
2. Participation in seminars / exercises	15	
3. Project preparation	15	
4. Final test preparation	15	
Student's workload		
Source of workload	hours	ECTS
Total workload	75	3
Contact hours	30	1
Practical activities	40	2