



### MODULE DESCRIPTION

Module code	full-time studies:	<b>Z-ZIP1-E-623</b>
	part-time studies:	<b>Z-ZIPN1-E-623</b>
Module name	<b>Engineering modeling</b>	
Module name in Polish	<b>Modelowanie inżynierskie</b>	
Valid from academic year	<b>2019/2020</b>	

### MODULE PLACEMENT IN THE SYLLABUS

Field of study	<b>MANAGEMENT AND PRODUCTION ENGINEERING</b>
Level of education	<b>1st degree</b>
Studies profile	<b>General</b>
Form and method of conducting classes	<b>Full-time and Part-time</b>
Specialisation	<b>Computer Science for Management and Modelling</b>
Unit conducting the module	<b>Department of Computer Science Technologies</b>
Module co-ordinator	<b>Paweł Stąpór, PhD</b>
Approved by:	<b>Dariusz Bojczuk, PhD, DSc</b>

### MODULE OVERVIEW

Type of subject / group of subjects	<b>Specialist subject</b>
Module status	<b>Non-compulsory</b>
Language of conducting classes	<b>English</b>
Module placement in the syllabus - semester	<b>Semester VI</b>
Initial requirements	<b>No requirements</b>
Examination (YES/NO)	<b>NO</b>
Number of ECTS credit points	<b>1</b>

Method of conducting classes		Lecture	Classes	Laboratory	Project	Other
Per semester	full-time studies:			<b>15</b>		
	part-time studies:			<b>9</b>		

## TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Category	Symbol	Learning outcomes	Assignations to the directional learning outcomes
Skills	U01	A student is able to use modern numerical analysis tools for modelling selected engineering problems.	ZIP1_U17
	U02	A student is able to apply the rules of modeling with the use of finite element analysis.	ZIP1_U19
Social competences	K01	He understands the need and knows the possibilities of continuous improvement, which leads to increasing personal professional competences.	ZIP1_K01

## TEACHING CONTENTS

Method of conducting classes	Teaching contents
Laboratory	<p>Presentation of the FEA (Finite Element Analysis) computing environment for modeling selected engineering problems.</p> <p>Modeling of stationary and non-stationary heat flows using the FEA program.</p> <p>Static and dynamic 2 and 3-D analysis in FEA.</p> <p>Modeling of contact issues including non-standard material models and large displacements in FAE.</p>

## METHODS OF ASSESSING TEACHING RESULTS

Symbol	Methods of checking the learning outcomes (select X)					
	Oral exam	Written exam	Test	Project	Statement	Other
U01					X	
U02					X	
K01						X

## FORM AND CONDITIONS OF PASSING

Form of classes	Form of credit	Passing conditions
Laboratory	Credit with grade	Obtaining a positive assessment from the report covering the implementation of the selected issue.

## STUDENT WORKLOAD

Balance of ECTS points												
No.	Type of student's activity	Student's workload										Unit
		full-time					part-time					
		Lc	C	Lb	P	O	Lc	C	Lb	P	O	
1.	Participation in the activities			15					9			h
2.	Other (consultation, exam)			2					2			h
3.	<b>Number of hours of a student's as- sisted work</b>	<b>17</b>					<b>11</b>					h
4.	<b>Number of ECTS credit points which are allocated for assisted work</b>	<b>0,7</b>					<b>0,4</b>					ECTS
5.	<b>Number of hours of a student's un- assisted work</b>	<b>8</b>					<b>14</b>					h
6.	<b>Number of ECTS credit points which a student receives for unassisted work</b>	<b>0,3</b>					<b>0,6</b>					ECTS
7.	<b>Work input connected with practical classes</b>	<b>25</b>					<b>25</b>					h
8.	<b>Number of ECTS credit points which a student receives for practical classes</b>	<b>1,0</b>					<b>1,0</b>					ECTS
9.	<b>Total number of hours of a stu- dent's work</b>	<b>25</b>					<b>25</b>					h
10.	<b>Punkty ECTS za modul</b> <i>1 ECTS=25 hours</i>	<b>1</b>										ECTS

## LITERATURE

1. Dassault Systemes Simulia Inc., *Abaqus Analysis User's Guide, USA, 2022.*
2. Akai T.J. (1994), *Applied numerical methods for engineers*, John Wiley & Sons, cop., New York.
3. Lee R. (2019), *ABAQUS for Engineers: A Practical Tutorial Book*, Independently published.
4. Reddy J. N. (2019), *An Introduction To The Finite Element Method*, 4th Edition, McGraw Hill – International edition.