COURSE DESCRIPTION CARD - SYLLABUS

Course name
Simulation methods

Course

Field of study
Aerospace Engineering

Year/Semester
2/4

Area of study (specialization)
-

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
15

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
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Responsible for the course/lecturer:
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Prerequisites

Knowledge: Basic knowledge of the construction of computer systems, basic knowledge of technical drawing

Skills: Ability to use computer systems, ability to draw a basic machine diagram using the principles of technical drawing

Social competences: Ability to work in a team

Course objective

Gaining knowledge of methods and processes related to modeling and simulation

Course-related learning outcomes

Knowledge

1. has extended knowledge necessary to understand the profile subjects as well as specialist knowledge about the construction, operation, air traffic management, safety systems, economic, social and environmental impact in the field of aviation and aerospace [K2A_W01]

2. Has ordered, theoretically founded knowledge in the field of aircraft traffic analysis, calculations and simulations using specialized software or tools created independently [K2A_W06]

3. Has knowledge of mathematics, including algebra, analysis, theory of differential equations, probability, analytical geometry [K2A_W09]

Skills

1. Can use learned mathematical theories to create and analyze simple mathematical models of machines and their elements as well as simple technical systems. [K2A_U26]

2. can draw a diagram and a simple machine element in accordance with the rules of technical drawing [K2A_U23]

3. is able to assess the usefulness and use the tools integrated with packages for spatial modeling, and correctly interpret their results [K2A_U17]

Social competences

1. understands the need for lifelong learning; can inspire and organize the learning process of other people [K2A_K01]

2. Is ready to critically assess the possessed knowledge and received content, recognize the importance of knowledge in solving cognitive and practical problems and consult experts in the event of difficulties with solving the problem independently [K2A_K02]

3. is aware of the social role of a technical university graduate, and especially understands the need to formulate and convey to the society, in particular through the mass media, information and opinions on the achievements of technology and other aspects of engineering activities; makes efforts to provide such information and opinions in a commonly understandable manner [K2A_K08]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Oral and written tests. Assessment of the presentation of the results of individual simulations.

Programme content

The subject is a general introduction to modeling and computer simulation in mechanics. The student learns the principles of building a model of phenomena. Then, selected theoretical issues concerning static analysis, dynamic analysis, matrix analysis of vibrations, stability analysis, numerical solving of non-stationary problems, computer fluid mechanics are presented. Theoretical issues are illustrated by solutions using specific modeling and numerical computation systems.

Teaching methods

Informative (conventional) lecture (providing information in a structured way) - may be of a course (introductory) or monographic (specialist) character Project method (individual or team implementation of a large, multi-stage cognitive or practical task, the effect of which is the creation of a work)

Bibliography

Basic

1.J. Kruszewski, E. Wittbrodt, Z. Walczyk: Vibrations of mechanical systems in computer terms, T II, selected issues, CAD / CAM Computer Support Series, WNT-Warsaw, 1996

2.Krystian Kapias: SolidWorks 2001 Plus. Fundamentals, ISBN: 83-7197-888-X

3. G. Kazimierczak, B. Pacula, A. Budzyński: Solid Edge. Computer-aided design, Helion Publishing House 2004, ISBN: 83-7361-174-6

4. E. Rusiński, Finite Element Method.COSMOS / M, WKŁ Warsaw 1994

Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation)[1]	45	2,0

[1] delete or add other activities as appropriate