COURSE DESCRIPTION CARD- SYLLABUS

Course name
Computer engineering analysis

Course

Field of study
Mathematics in Technology
Area of study (specialization)
—
Level of study
first-cycle studies
Form of study
full-time

Year/Semester
4/7
Profile of study
general academic
Course offered in
Polish
Requirements
elective

Number of hours

Lectures
15
Tutorials
—
Laboratory classes
15
Projects/seminars
15
Other (e.g. online)
—

Number of credit points

4

Lecturers

Responsible for the course/lecturer::

mgr Robert Salamon

Responsible for the course/lecturer::

—

Prerequisites

The student starting this subject should have basic knowledge in mathematics, mechanics and physics. He should also have the ability to think logically and using information found in the library and on the Internet, and be willing to cooperate as part of a team.

Course objective

Be acquainted with capabilities of SolidWorks and Inventor CAE system and receive practical training in how to use this system.

Course-related learning outcomes

Knowledge

- knows principles of CAx systems, drawing up technical documentation and modelling in 3D.

Skills

- is able to model structure correctly in 3D systems;
- is able to apply advanced SolidWorks and Inventor functions to solve engineering problems;
- follows health and safety rules when using a computer;
- can work individually and collectively; can estimate time spend on a project implementation.

Social competences

- is aware of lifelong learning and improving his skills;
- is aware of a social aspects of practical knowledge and its responsibility.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures: knowledge acquired during the lecture is verified by the exam during the session; the exam consists of several dozen questions (test and open), variously scored. Passing threshold: 50% of points; exam issues, on the basis of which questions are prepared, will be sent to students by e-mail using the university e-mail system.

Laboratory classes: skills acquired as part of the laboratory classes are verified on the basis of a final test, consisting of 3-5 tasks differently scored depending on their level of difficulty and on the basis of prepared reports on selected classes; passing threshold: 50% of points.

Programme content

Update: 10.09.2020r.

Lectures:

- a review of the CAx software and its functions. Basic analyses in the CAx systems. Verification problems of virtual models. Commercial CAE softwares. CAE tools in SolidWorks and Inventor. The simulation analysis types: Finite Element Analysis, Multibody Dynamics, Computational Fluid Dynamics, Simulation of mechanical processing. Discretization types of CAD models. The results interpretation: stress, strain, displacement, safety factor. Methods of results presentation. The creation of 2D drawing.

Laboratory classes:

- an introduction to CAD systems and its description. a clarification of the notions: system based on operations, integrated, parametric. The system modules. The system interface: the screen layout, entering commands, work with models: display, rotate, move, magnifying glass etc. The idea and the way of creating models. The modifications of geometric model– advantages of the parametric model;

- a creation of parametric sketches: sketching rules, sketch plane, references, sketching, modifying geometry, adding dimensions, relations, regeneration;
- a creation of operations based on the sketch – adding or removing material: extruded, revolved, swept, lofted boss/base;
- a creation of operations not requiring the sketch: holes, fillets and chamfers etc;
- a creation of reference geometry: planes, axes, coordinate systems and points;
- a modification of the model geometry: dimension change, remove of the operation, change of operation order;
- adding of dimension relations, using global parameters of the model;
- types of pattern – creation and modification. Copy of operation;
- a creation of 3D parametric parts, exercises;
- a creation of 2D drawing of parts or assemblies from 3D models. Views and sections;
- inserting, removing and positioning components in an assembly;
- a motion study– animation;
- an introduction to strength analysis;
- simulation of mechanical processing.

Teaching methods

Lectures: lecture with audiovisual aids supplemented with interactive, problem-based discussion.

Laboratory classes: laboratory supplemented with audiovisual aids, using software available for students at home.

Bibliography

Basic

- Kęska P.: Solidworks 2018: nowości w programie, porady praktyczne oraz ćwiczenia. CADvantage, Warszawa, 2018.
- Domański J.: SolidWorks 2017: projektowanie maszyn i konstrukcji: praktyczne przykłady. Wydawnictwo Helion. Gliwice, 2017.
- Lombard M.: SolidWorks 2010 bible. Wiley Publishing Inc., Indianapolis, 2010.

Additional

- https://my.solidworks.com/

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for laboratory classes, preparation for tests/exam, reports preparation)	50	2,0