
Course title: CAD/CAE COMPUTER SYSTEMS

ECTS credit allocation (and other scores): 4

Semester: autumn

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 45

Course coordinator/ Department and e-mail: Andrzej Jaskulski, Department of Mechanics and Basis of Machinery Construction, andjas@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: CAD tools and techniques review; 2D design and drafting with the aid of nonparametric CAD system; 3D part and assembly parametric and adaptive modeling and calculation with the aid of 3D parametric-adaptive CAD system; creation of two way integrated 2D drawing views from 3D parametric models; 2D drawing views annotation; creation of 3D documentation (presentations) from 3D models; hierarchical solid and surface feature based 3D parametric modeling; solid freeform modeling; CAD/CAE systems integration; data exchange between CAD systems.

LECTURES: The structure of CAD, CAM, CAE, CIM, CE, ETO concepts; typical workflow of Computer Aided Design (CAD) process; typical structure of CAD systems; economic and organizational aspects of CAD; classification and capabilities of CAD/CAE systems; representation and notation of the construction; computer representation and notation of the construction; review of computer aided design techniques; the latest and possible future trends in CAD systems technology; part and assembly design with the aid of parametric and nonparametric, 2D and 3D CAD/CAE systems; data exchange between CAD/CAE systems.

Learning purpose: Knowledge of CAD/CAE techniques and systems; ability to effectively use CAD/CAE tools and techniques.

On completion of the study programme the graduate will gain:

Knowledge: Knowledge of 2D and 3D CAD/CAE/ETO methods, techniques and systems.

Skills: Ability to effectively use 2D and 3D CAD/CAE tools and techniques.

Social Competencies: Ability to choose the right techniques and tools to solve the design task while working in a team.

Basic literature: Jaskulski A.: Free of charge training material; Jaskulski A.: AutoCAD 2021PL/EN/LT. Metodyka efektywnego projektowania parametrycznego i nieparametrycznego 2D i 3D, Wydawnictwo Helion, Gliwice 2020; Jaskulski A.: Autodesk Inventor Professional 2021PL/2021+/Fusion 360. Metodyka projektowania, Wydawnictwo Helion, Gliwice 2020; Osiński Z., Wróbel J.: Teoria konstrukcji, PWN, Warszawa 1995.; Jaskulski A.: Engineer-to-Order Approach To High Speed Bucket Elevator Design in a Small Enterprise, Applied Engineering in Agriculture, 2008, Vol. 24 (5), pp. 545-557, American Society of Agricultural and Biological Engineers, ISSN 0883-8542

Supplementary literature: Jaskulski A.: Autodesk Inventor 2020PL/2020+. PODSTAWY metodyki projektowania, Wydawnictwo Naukowe PWN SA, Warszawa 2019; Jaskulski A.: Blog <http://cadaj.blogspot.com/>; Jaskulski A.: YouTube channel <http://www.youtube.com/user/andjask>; Ascent - Center for Technical Knowledge: AutoCAD 2022.

Fundamentals - Part 1 (Mixed Units); Ascent - Center for Technical Knowledge: AutoCAD 2022. Fundamentals - Part 2 (Mixed Units); Ascent - Center for Technical Knowledge: Autodesk Inventor 2021. Introduction to Solid Modeling; Tremblay, T.: Autodesk Inventor Certified User Exam Study Guide. Inventor 2021 Edition; Jaskulski A., Wróbel J.: Simulation of unloading process in bucket elevators, Archiwum Budowy Maszyn Vol. XL z. 3-4/1993, pp. 301-315; 25. Jaskulski, A.: Cloud Computing in Computer Aided Machinery Design, International Conference on Challenges and Opportunities In Mechanical Engineering, Industrial Engineering and Management Studies ICCOMIM -2012, Ms Ramiah Institute Of Technology, Bangalore, India, 11-13 July, 2012; Jaskulski A.: Concurrent design technology for a small enterprise in Poland, X Sino-Polish Conference On CAD In Machinery, IPBM PW, Warsaw 2001.

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 46

Student's independent work: 54