COMPUTER AIDED DESIGN

General information

Subject	Computer Aided Design
Faculty	Faculty of Civil Engineering, Architecture and Environmental Engineering
Course of study	Architecture
Profile	General academic
Type of study	I level with the degree of Eng. Arch.
Starting semester	Winter semester

Information about the subject

Semester	3
Number of ECTS points	2
Subject type	obligatory
Language of instruction	English
Syllabus prepared by	Michał Golański MSc. arch.

Type of class

Course type	*Number of classes per semester (full time studies)*	*Number of classes per week (full time studies)*	*Number of classes per semester (part time studies)*	*Number of classes per week (part time studies)*	*Credit type*
Laboratory	15	1	-	-	Credit with a grade

Subject objective

The objective in terms of knowledge is to familiarize the student with the problems of development of digital technologies and their consequences for the theory of architecture, design methodology and production technologies in construction.

The objective in terms of skills is to teach the student to work independently with the computer, to use commonly used IT devices in personal and professional life and to develop practical skills at conscious and efficient use of tools and methods of computer aided architectural design.

The objective in terms of personal and social competences is to prepare the student for a job using computer aided architectural design:

− independent work, enabling further self-education,

− teamwork with other architects and designers from other industries.

Initial requirements

Formal: basic knowledge of computers, knowledge of technical drawing,

Informal: none

Subject scope

Laboratory:
Discussion of the specificity and innovativeness of AutoCAD and ArchiCAD:
− user interface, personalization of program settings, initial organizational activities,
− initial organizational activities, work on layers,
− coordinate systems, units of measurement,

− tool palettes, basic program tools,
− basic editing operations on elements of graphic drawings,
− dimensioning and describing drawings
− user interface, personalization of program settings,
− creating your own library elements, individual lines and fills,
− dimensioning and describing drawings,
− creating a spatial model of a building,
− preparation of project documentation,
− importing and exporting drawings and other materials,
− preparing drawings for printing.

Basics of computer graphics:
− introduction to computer graphics, raster graphics and vector graphics,
− basic editing operations on elements of graphic drawings.

Educational methods
Exercise-practical methods: laboratory method

Education results and verification methods			
Description	*Symbol*	*Verification method*	*Type of class*
The student has ordered, theoretically founded general knowledge including computer aided tools for CAD architectural design. The student knows and can show the basic editing operations on the elements of graphic drawings used in solving simple engineering tasks in the field of architecture and urban planning. The student knows the basic methods, techniques, tools and materials used in architecture design; knows the elements of professional ethics and basic issues in the field of intellectual property protection in terms of importing and exporting drawings and other materials	K_W01 K_W05 K_W07 K_W11	−− participation in class −− current checking during classes −− internship documentation −− observation and evaluation of participation in class −− observation and assessment of the student's practical skills −− opinion of the tutor of the internship	Laboratory
The student can use various IT, computational and graphic techniques to formulate and solve simple engineering tasks in the field of architecture, construction and urban planning. The student can spatially model individual building elements and building complexes; can prepare and conduct a presentation of individual and artistic studies as well as design ideas using CAD computer programs and prepare drawings for printing. The student can follow the principles of the ethics of the profession of an architect and urban planner, with the provisions of intellectual property protection in the field of importing and exporting drawings and other materials. The student can acquire information from various sources and databases. The student can integrate, interpret and draw conclusions; can use and communicate with various information	K_U01 K_U02 K_U03 K_U04	−− participation in class −− current checking during classes −− internship documentation −− observation and evaluation of participation in class −− observation and assessment of the student's practical skills −− opinion of the tutor of the internship	Laboratory

and communication techniques in a professional environment, also in English			
The student is aware of the need to provide viable information in a manner comprehensible to the public, reliable information and multilateral opinions on technical achievements and various engineering design studies in the field of architecture and urban planning. The student is prepared to undertake in the field of computer hardware professional activities as an auxiliary employee in construction execution and supervision. The student understands the need to extend knowledge and exchange information. The student can cooperate in a group, assuming different roles.	K_K06 K_K08	−− participation in class −− current checking during classes −− internship documentation −− observation and evaluation of participation in class −− observation and assessment of the student's practical skills −− opinion of the tutor of the internship	Laboratory

Requirements to obtain a credit

The condition for a credit for the laboratory is attendance and participation in class and a positive grade for all exercises as specified in the syllabus.

Scoress: 0 - 50% /unsatisfactory; 51 - 60% / satisfactory; 61-70% / satisfactory plus; 71 - 80% / good; 81 -90% / good plus; 91 -100% / very good.

Student's work

Student's work	Full time study (h)
Interaction with the teacher (classes; consultations; exam, etc.)	25
Student's individual work (preparation for the classes, test exam; literature research preparation of: written paper, project, presentation, report, speech; etc.)	25
Total	50
ECTS points	Full time study
Work with a teacher	1
Work without a teacher	1
Total	2

Basic literature

1. MacKenzie, Scott H., Rendek A., *ArchiCAD 19–The Definitive Guide*. Packt Publishing Ltd, 2015.
2. Moss E., *Autodesk AutoCAD Architecture 2017 Fundamentals*, SDC Publications, 2016.
3. Ridder D., *ArchiCAD 21: Praxiseinstieg,* MITP-Verlags GmbH & Co. KG, 2017.
4. Sullivan V., *Interactive ArchiCAD Practice Manual,* Blacknblue Press, 2012.
5. Szalapaj P., *CAD Principles for Architectural Design*, Routledge, 2013.
6. Podręcznik online Autodesk AutoCAD Architecture.

Complementary literature

1. Gawrysiak P., *Cyfrowa Rewolucja. Rozwój cywilizacji informatycznej*, Wydawnictwo Naukowe PWN S.A., Warszawa 2008.
2. Pikoń A, AutoCAD 2018 PL, Wydawnictwo Helion, Gliwice 2018.
3. Kacprzyk Z., Pawłowska B., *Komputerowe wspomaganie projektowania*, Oficyna wydawnicza Politechniki Warszawskiej, Warszawa 2012.
4. Montusiewicz J., Lis R., Dziedzic K., *Bitmapowa grafika komputerowa: wprowadzenie do programu GIMP 2.8.,* Wyd. Politechniki Lubelskiej, Lublin 2012.
5. Szczerbanowski R., *Obiekty trójwymiarowe. AutoCad 2013. PL,* Wyd. Politechniki Łódzkiej.

Łódź 2013.

6. Szozda K., Świat Architektury: Architekt i Komputer; omówienie problematyki wspomaganego komputerowo w zakresie 2D I 3D; W.A. sp. z o.o. Wrocław 2011.
7. Ślęk R., *ArchiCAD - Wprowadzenie do projektowania BIM*, Wydawnictwo Helion, Gliwice 2013.
8. Tomaszewska A., *Inkscape. Ćwiczenia praktyczne*, Wydawnictwo Helion, Warszawa 2008.
9. Tomaszewska-Adamarek A., Google SketchUp. Ćwiczenia praktyczne. Wydawnictwo Helion. Warszawa 2010.
10. Zimek R., Oberlan Ł., ABC grafiki komputerowej. Wydanie II, Wydawnictwo Helion, Gliwice, 2005.

Notes

Laboratory classes in a computer laboratory. The maximum number of students in the laboratory group: 15 lab stands.