KARTA OPISU PRZEDMIOTU - SYLABUS

Nazwa przedmiotu

Digitally designed architecture

Przedmiot

Kierunek studiów

ARCHITECTURE

Studia w zakresie (specjalność)

–

Poziom studiów

first-cycle

Forma studiów

full-time

Rok/semestr

III/5

Profil studiów

general academic

Język oferowanego przedmiotu

Polish

Wymagalność

obligatory

Liczba godzin

Wykład

15

Laboratoria

30

Inne (np. online)

Ćwiczenia

0

Projekty/seminaria

0

Liczba punktów ECTS

2

Wykładowcy

Odpowiedzialny za przedmiot/wykładowca:

Doctor of Architectural Engineering Borys Siewczyński e-mail: borys.siewczynski@putpoznan.pl tel. 61 665 32 90 Wydział Architektury ul. Jacka Rychlewskiego 2 61-131 Poznań tel.: 061 665 32 55

Odpowiedzialny za przedmiot/wykładowca:

Doctor of Architectural Engineering Borys Siewczyński

Doctor of Architectural Engineering Marcin Giedrowicz

Master of Architectural Engineering Jan Szot

Master of Architectural Engineering Krystian Laszewicz

Wymagania wstępne

– the student has basic knowledge about the rules of safe use of computer equipment

– the student has basic knowledge about graphics software

– the student can obtain information from literature, databases, and properly selected sources, integrate information, interpret it, and draw conclusions, as well as form and justify opinions

– the student can use computer equipment

– the student can correctly identify and solve dilemmas related to the practice of the profession

Cel przedmiotu

• The aim of the course is to teach the basic current knowledge: theoretical and practical knowledge about computer-aided design in the area of advanced, multi-faceted modeling of information about a building

• Within the framework of the course, the basic knowledge about computer-aided design is taught in the context of architectural skills. Specific practical exercises are done during the classes in order to teach students the knowledge about the topic, that is, contemporary IT skills. The exercises are preceded by an introduction to the use of particular design applications.

Przedmiotowe efekty uczenia się

Wiedza

A.W1. architectural design – performing simple tasks, in particular: creating simple structures taking into account the users' basic needs, single- and multi-family residential development, service facility in residential development complexes, public utility facilities in an open landscape or in an urban environment;

A.W4. the principles of universal design, including the design of space and buildings accessible to all users, in particular, to people with disabilities, in architecture, urban planning, and spatial planning, and the principles of ergonomics, including the ergonomic parameters necessary for ensuring the functionality of the designed space and objects for all users, in particular, for people with disabilities.

Umiejętności

A.U1. designing an architectural structure, creating and shaping the space so as to endow it with new values, in accordance with the program which takes into account all users' requirements and needs;

A.U4. carrying out a critical analysis of the conditions, including a valorization of the site development;

A.U5. thinking and acting in a creative way, making use of the skills necessary for maintaining and broadening the ability to apply artistic concepts in architectural and urban design;

A.U6. integrating information obtained from various sources, interpreting them and analyzing them critically;

A.U7. communicating with the use of various techniques and tools in the professional environment for architectural and urban design;

A.U8. preparing architectural and construction documentation in appropriate scales, in relation to the conceptual architectural design;

A.U9. implementing the rules and guidelines of universal design in architecture, urban planning, and spatial planning.

Kompetencje społeczne

A.S1. thinking independently in order to solve simple design problems;

A.S2. taking responsibility for the shaping of the environment and the cultural landscape, including the preservation of the heritage of the region, country, and Europe.

Metody weryfikacji efektów uczenia się i kryteria oceny

Efekty uczenia się przedstawione wyżej weryfikowane są w następujący sposób:

Formative evaluation:

• Lectures: test - checks the knowledge and understanding of the presented issues.

• Laboratory classes: Evaluation of work during particular classes. The grading scale: 2.0; 3.0; 3.5; 4.0; 4.5; 5.0 Summative evaluation

• laboratory classes: grade point average for grades obtained in particular classes

• lectures: the grade for the written test; the grading scale: 3.0; 3.5; 4.0; 4.5; 5.0

Treści programowe

Within the framework of the course, the basic knowledge about computer-aided design is taught in the context of architectural skills. During classes, examples of the applications of contemporary computer tools. Students also learn the theoretical foundations of computer-aided design. The broad spectrum of the application of computer software and equipment is discussed. The IT problems are presented in connection with the engineering and architectural practice. Another topic covered in this course is the role of IT techniques in the coordination and exchange of design data. The issues are exemplified with particular design applications. The subject matter of the course is to provide the basis for the students' own creative quests directly related to the laboratory classes. The aim of the course is to teach students the foundations of the current theoretical and practical knowledge about

3

computer-aided design. The lectures are also a theoretician introduction to the practical tasks done within the framework of laboratory classes. 1. Introductory issues, computer-aided design in architect's work. The development of the technology of architectural modeling. BIM in the context of architectural and construction modeling – basic concepts. 2. BIM in the context of architectural and construction modeling – continuation. Digital formats and the building law. Efficient energy use in the light of architectural information modeling. 3. 3D scanning and photogrammetry in architectural modeling. Simulation and calculation software. Expert systems, artificial intelligence. 4. Structural 'leather,' – technological methods of constructing complex curvature surfaces in contemporary parametric architecture 5. Cellular automata, I-systems, fractals – IT foundations of generative architecture and optimization in parametric architecture – evolutionary and swarming patterns 6. 3D printing and CNC

fabrication – new tools in parametric and generative architecture 7. Summing up, trends in software development and in architect skills. Final test.

Metody dydaktyczne

Lecture: lecture / problem session / lecture with a multimedia presentation; laboratory classes: doing experiments with the use of the software which illustrates the typical design problems, having received instructions; project method: project – practical; case analysis / discussion / problem solving

Literatura

Podstawowa

1. Gawrysiak P.; Cyfrowa Rewolucja. Rozwój cywilizacji informatycznej, Wydawnictwo Naukowe PWN S.A., Warsaw 2008

2. Januszkiewicz K. "O projektowaniu architektury w dobie narzędzi cyfrowych. Stan aktualny i perspektywy rozwoju." Oficyna Wydawnicza Pwr., Wrocław 2010

3. Tomana A.: BIM. Innowacyjna technologia w budownictwie, Kraków 2015

Uzupełniająca

1. Archivolta – all editions from 2013–2014, Wydawnictwo Archivolta, Węgrzce Kasznia Dariusz, Magiera Jacek, Wierzowiecki Paweł, BIM w praktyce, Wydawnictwo Naukowe PWN,2018

2. BIM in pronciple and Practice, P.T Barnes & N. Davies

3. Deutsch R., BIM and Integrated Design. Strategies for Architectural Practice, The American Institute of Architects, Wiley and Sons Ins, Hoboken, New Jersey, 2011

4. Fuller B. Applewhite Synergetics: Exploriations in the Geometry of Thinking, Macmillan Pub Co., New York

5. K.M. Kensek, D. E. Noble, Building information modeling, BIM in current and future practice,, Wiley 2014

6. Khazabi Z. Generative Algorithms Concepts and Experiments: Strip Morphologies, digitally published Morphogenesism, 2012

7. Milgram'a P. i Kishino A. F.; Taxonomy of mixed reality visual displays, IEICE Transactions on Information Systems

8. R. Garber, BIM Design, realising the creative potential of building information modeling, Wiley, 2014
9. Randy Deutsch, BIM and integrated design, Strategies for architectural practice, IAI, Wiley 2011

Bilans nakładu pracy przeciętnego studenta

	Hours	ECTS
Total labor input	60	2,0
these classes require direct contact with the instructor.	45	1,5
5student's own work (study of literature, preparing for laboratory classes / classes, preparing for tests/exams, doing a project)[1]	15	0,5

[1] Delete as appropriate, or add other actions.