



Faculty of Architecture

WEST POMERANIAN UNIVERSITY OF TECHNOLOGY
IN SZCZECIN, POLAND

THE OFFER FOR INTERNATIONAL STUDENTS
FOR THE YEAR 2022/2023
FIRST DEGREE

	Course title	Person responsible for the course	Semester (winter/summer)	ECTS points	Hours
1	ANALYSIS OF ARCHITECTURAL FORM - exercises	Tomasz Sachanowicz	winter	2	30
2	Anthropology of Architecture and Urban Design	Marek Ostrowski	summer	3	45
3	BASIC ARCHITECTURAL DESIGN II – Multifamily houses - lectures and exercises	Grzegorz Ferber	summer	4	60
4	BASIC ARCHITECTURAL DESIGN I – Multifamily houses - lectures and exercises	Grzegorz Ferber	winter	4	60
5	BASIC ARCHITECTURAL DESIGN - Lectures and exercises	Leszek Świątek	winter	6	75
6	BASIC ARCHITECTURAL DESIGN - One family houses - exercises	Marek Wołoszyn	winter/summer	6	75
7	Computer Aided Design 3D- Deepening Course I	Kamila Nowak	winter	4	60
8	Computer Aided Design 3D- Deepening Course II	Kamila Nowak	summer	4	60
9	Computer Aided Design 3D - introductory course I	Kamila Nowak	winter	3	45
10	Computer Aided Design 3D - introductory course II	Kamila Nowak	summer	3	45
11	Construction design - Statics and mechanics of structures	Olga Kopczyńska	winter/summer	3	45
12	Construction systems	Olga Kopczyńska	winter/summer	2	30
13	Design BIM objects for architecture	Dorota Janisio-Pawłowska	winter/summer	3	45
14	Documentation and technical detailing in architectural drawing	Piotr Gradziński	winter/summer	2	30
15	Ergonomy. Health and Safety.	Marek Ostrowski	winter	4	60
16	Heritage Protection	Jakub Gołębiewski	winter	4	60
17	Information Technology I	Kamila Nowak	winter	2	30
18	Information Technology II	Kamila Nowak	summer	2	30
19	Interior design - visualizations and animations	Wojciech Pawłowski	winter/summer	3	45
20	Introduction to architectural design I	Leszek Świątek	winter	4	60
21	Introduction to architectural design II	Leszek Świątek	summer	4	60
22	Introduction to BIM	Wojciech Pawłowski	winter	4	45
23	Mapping and Rendering I	Kamila Nowak	winter	4	45
24	Mapping and Rendering II	Kamila Nowak	summer	4	45
25	PARAMETRIC ARCHITECTURAL DESIGN	Krystyna Januskiewicz	summer	4	45
26	Rural design	Olga Gazińska	winter	4	60
27	Special architectural design	Leszek Świątek	winter	4	45
28	Techniques and technologies in the architecture and construction	Piotr Gradziński	winter/summer	2	30

	Course title	Person responsible for the course	Semester (winter/summer)	ECTS points	Hours
29	Urban design	Klara Czyńska	winter	4	60

Course title	ANALYSIS OF ARCHITECTURAL FORM - exercises		
Level of course	first cycle		
Teaching method	project course		
Person responsible for the course	Tomasz Sachanowicz	E-mail address to the person	Tomasz.Sachanowicz@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-01-S	ECTS points	2
Semester	winter	Language of instruction	english
Hours per week	2	Hours per semester	30
Objectives of the course	<p>Gaining knowledge about the circumstances surrounding the shaping of architectural form.</p> <p>Getting to know the rules of logic and internal consistency of architectural form.</p> <p>Getting familiar with the principles of conscious and accurate decision-making in the design process.</p>		
Entry requirements	Competence in freehand drawing, modeling simple objects, the skill of expression and logical thinking.		
Course contents	<p>Analysis of the forms shaped by natural processes - the determinism of nature.</p> <p>Analysis of the forms as subordinate values - issues of determinism and indeterminism in human creative activity.</p> <p>Analysis of the forms as subordinate to the way of use.</p> <p>Analysis of the form as a carrier of meaning - a process of connotation and denotation, and regarding issues of semiotics and semantics.</p> <p>Analysis of the forms in the context of human cognitive capabilities.</p> <p>Analysis of the forms as subordinate to the influence of context - the impact of environment on architectural form.</p>		
Assessment methods	<p>description, lecture, explanation or clarification</p> <p>Classic problem method, activating methods: the method of cases, situational method, games teaching - (simulation, decision making), discussion teaching - (multiple, panel).</p> <p>Practical methods (screening, exercise examination, project method, simulation)</p> <p>Evaluation of the results achieved in solving the tasks in the context of the established evaluation criteria (formal, substantive and aesthetic).</p> <p>Evaluation of the results achieved in solving the task compared to other students in the group.</p>		
Recommended readings	<ol style="list-style-type: none"> 1. Alexander Ch., A Patern Language - Towns, Buildings, Construction, Oxford University Press, New York, 1977 2. Benyus J.M., Biomimicry. Innovation Inspired by Nature, Harper Perennial, New York, 1997 3. Brand S., How Buildings Learn: What happens After They`re Built, Viking Press, New York, 1994 4. McDonough W., Braungart M., Cradle to Cradle: Remaking the Way We Make Things, North Point Press, San Francisco, 2002 		
Knowledge	<ol style="list-style-type: none"> 1. Theoretical background of architectural creation. 2. Knowledge of the principles of architectural composition. 3. Ability to design architectural form due to various factors. 4. Mastering the principles of argumentation and rational decision-making. 		
Skills	<ol style="list-style-type: none"> 1. Theoretical background of architectural creation. 2. Knowledge of the principles of architectural composition. 3. Ability to design architectural form due to various factors. 4. Mastering the principles of argumentation and rational decision-making. 		
Other social competences	<ol style="list-style-type: none"> 1. Theoretical background of architectural creation. 2. Knowledge of the principles of architectural composition. 3. Ability to design architectural form due to various factors. 4. Mastering the principles of argumentation and rational decision-making. 		

Course title	Anthropology of Architecture and Urban Design		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Marek Ostrowski	E-mail address to the person	mostrowski@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-02-S	ECTS points	3
Semester	summer	Language of instruction	english
Hours per week	3	Hours per semester	45
Objectives of the course	<p>The aim of the course is to broaden the knowledge of the biological and cultural determinants of human spatial behavior.</p> <p>Gain the knowledge about the impact of architectural and planning solutions for human spatial behavior and the nature of social relationships.</p> <p>The acquisition of knowledge about the environmental stresses and the consequences of life in the urban environment.</p> <p>Learn about the causes of the social pathologies and their relationship to the character of the spatial environment.</p> <p>Gain the knowledge of the strategies and the principles of the design and planning activities which allow to develop a safe and human-friendly environment.</p>		
Entry requirements	Basic knowledge of the architectural design and urban planning.		
Course contents	<p>The analysis of the quality of life and the feeling of security in the particular area of residential facilities or public space. The quality of life and feeling of security in social relations. Architectural design and urban planning as a tool for the prevention of crime.</p> <p>Architecture in an anthropological perspective.</p> <p>Territorialism; organic space; proxemics.</p> <p>Social space, relations between - and do-social.</p> <p>Social psychology; sociology of built environment.</p> <p>The built environment as a source of stress; urban overload and sensory overload; stress situation model; types of stress reactions.</p> <p>Structure of spatial barriers and distances, and the need for safety and freedom; spatial and social stressors.</p> <p>Psychophysical, economic, cultural aspects of space accessibility stress; integrative and segregated accessibility model.</p> <p>Stress of density and feeling of congestion; anonymity of life in large clusters.</p> <p>Spatial pathologies; escape and oppressive spaces; the scale of architectural interiors' stressfulness; ergonomic, proximal and architectural methods of analysis, dimensioning and behavioural rehabilitation of space.</p> <p>Social pathologies in the built environment, statistics, types, causes.</p> <p>Forms of defensive behaviour of inhabitants; conditions of effective control over space.</p> <p>The phenomenon of privatization of public spaces; gated communities problem.</p>		
Assessment methods	<p>Lecture information using a multimedia presentation</p> <p>Group and individual correction of of projects</p> <p>On the project area - observation and documentation of events and issues</p> <p>The evaluation of the paper on selected strategies and principles for safe living environment.</p> <p>The evaluation of the final test that checks the knowledge and the ability to use the conceptual apparatus in interpreting the causes of stressful situations in completed investments and project solutions.</p> <p>The evaluation of the final project presentation.</p> <p>The evaluation of the study on the living conditions and the level of security in selected object, residential unit or part of the public space.</p> <p>The completion of the lecture is based on the attendance list and the written verification test.</p>		
Recommended readings	<ol style="list-style-type: none"> 1. Alexander Ch., A Patern Language - Towns, Buildings, Construction, Oxford University Press, New York, 1977 2. Gehl J., Cities for People, Island Press, Washington DC, 2010 3. Gehl J., Life Between Buildings: Using Public Space, Island Press, Washington DC, 2011 4. Hall E.T., The Hidden Dimension, Anchor Books, New York, 1990 5. Newman O., Defensible Space; Crime Prevention Through Urban Design, Macmillan Publishing, New York, 1973 		
Knowledge	The student has basic knowledge of physical, social and cultural anthropology as well as proxemic aspects of architecture and urban planning. The student knows the spatial and social causes of stressful situations in a built environment. Student knows strategies of crime prevention through urban and architectural design; he knows methods of shaping safe spaces.		
Skills	Student has a basic knowledge of physical anthropology, social and cultural aspects of architecture and urban planning. Knows the spatial and social causes of stress in the built environment. Knows the causes of urban and social pathology and strategies for crime prevention through urban planning and architectural design; knows the rules of safe space design. Understand the impact of design decisions and planning the nature and level of risks of crime in the built environment.		
Other social competences	The student understands the impact of design solutions on the nature and level of crime threats in a built environment. The student understands the influence of passive and active safety standards on the quality of life and social relations in a built environment.		

Course title	BASIC ARCHITECTURAL DESIGN II - Multifamily houses - lectures and exercises		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Grzegorz Ferber	E-mail address to the person	gferber@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-05-S	ECTS points	4
Semester	summer	Language of instruction	english
Hours per week	4	Hours per semester	60
Objectives of the course	Acquisition of skills in shaping multifamily housing complexes based on various types and layouts of housing and the structure of apartments developed individually in the 5th semester in a specific urban situation. Adopting optimal compositional and artistic solutions for buildings and building complexes.		
Entry requirements	The student should actively participate in the design exercises. In particular, it should have advanced design studies in accordance with the schedule. It should also show alternative design proposals, and in case of inability to solve a given project problem, indicate the elements that have become the cause. The student should always have printouts enabling the basic recognition of the design solution he has adopted. If the correction is not concluded without a clear conclusion, he should stay in the room and repeat the conversation with the lecturer. Participation in periodic reviews of project work is compulsory.		
Course contents	<p>Exercise 1. Initial considerations regarding functional and spatial relationships in building complexes.</p> <p>Exercise 2. Housing systems.</p> <p>Exercise 3. Evaluation of housing systems.</p> <p>Exercise 4. Area and surface indicators.</p> <p>Exercise 5. Isochron on pedestrian crossings in the residential area.</p> <p>Exercise 6. Basic building systems (1st overview of the progress of works).</p> <p>Exercise 7. Selection of the form of housing for the housing area.</p> <p>Exercise 8. Cultural determinants in the housing area.</p> <p>Exercise 9. Methods of developing housing.</p> <p>Exercise 10. The range of devices in the housing complex.</p> <p>Exercise 11. Scope of the final development of building systems (2nd overview of the progress of design works).</p> <p>Exercise 12. Adapting the residential area to the needs of disabled people.</p> <p>Exercise 13. Studying the silhouette of buildings for the housing area.</p> <p>Exercise 14. Circular and pedestrian communication in a residential area.</p> <p>Exercise 15. Approval of projects for final elaboration.</p>		

- Lecture 1. Areas of multi-family buildings in cities.
- Lecture 2. Ecological conditions of a residential environment. Climate, acoustics, landscape values.
- Lecture 3. Utilitarian values of the existing development. Demographic and social conditions.
- Lecture 4. The essence and role of a housing unit. Unit set.
- Lecture 5. Functional and spatial arrangement of a housing complex.
- Lecture 6. Types of housing and their properties.
- Lecture 7. The program, the role and location of educational, care and health facilities in the housing estate, the housing area.
- Lecture 8. Open-air facilities, Family orphanages, residential homes for elderly people in the housing area.
- Lecture 9. Location, program and role of commercial and service facilities in the residential area.
- Lecture 10. Forms of centers and commercial and service teams in the housing area.
- Lecture 11. Socio-cultural devices in the housing area.
- Lecture 12. Administration and technical service in the housing area.
- Lecture 13. Open areas in the housing area.
- Lecture 14. Communication.
- Lecture 15. Parking and service of cars in the housing area.

Assessment methods	<p>1. Lectures - an informative lecture with explanations as well as a didactic discussion at the final stage of the lecture. Students are also mobilized to project solutions on a regular basis.</p> <p>2. Exercises - the course in the subject is based on an independent study work and a design correction during the classes with the help of an academic teacher. A lot of attention is paid to the development of variant solutions.</p> <p>Lectures (semester 1th and 2th) - the condition to take the exam in the subject is participation in at least 4/5 the number of lectures, obtaining a positive assessment of project exercises, having notes prepared during lectures and conducting a source query in accordance with the guidelines given after the beginning classes in a given semester.</p> <p>Exercises (semester 1th and 2th) - participation in at least 4/5 of the number of project classes and preparation of a project study in any graphics technique, consistent with the content of the subject, is a prerequisite for getting a pass. You should also have sketches and studies created for the semester review of the project work. The evaluation takes into account the substantive value (60% of the weight) and the aesthetic design (20%) as well as the novelty of functional and spatial solutions of the apartments as well as the aesthetic and compositional façades (20%).</p>
Recommended readings	<ol style="list-style-type: none"> 1. Alexander Ch., A Patern Language - Towns, Buildings, Construction, Oxford University Press, New York, 1977 2. Borer P., Harris C., The Whole House Book. Ecological building design & materials, The Centre for Alternative Technology, Machynlleth, 1998 3. Falkenberg H., Ecoarchitecture. Urban style, Evergreen GmbH, Koeln, 2008 4. McCamant K., Durrett Ch., Cohousing. A Contemporary Approach to Housing Ourselves, Ten Speed Press, Berkeley, 1998
Knowledge	Understanding of spatial and social patterns, inquiry designing processes to organize living space effectively with use of various tools and virtual simulations methods.
Skills	<p>Ability to design and integrate functions, structural systems and architectural forms of multifamily houses and estates.</p> <p>Understanding of spatial and social patterns, inquiry designing processes to organize living space effectively with use of various tools and virtual simulations methods.</p> <p>Ability to produce appropriate architectural project presentation, precise technical drawings and specifications, 3D models and visualizations</p>
Other social competences	Ability to produce appropriate architectural project presentation, precise technical drawings and specifications, 3D models and visualizations

Course title	BASIC ARCHITECTURAL DESIGN I - Multifamily houses - lectures and exercises		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Grzegorz Ferber	E-mail address to the person	gferber@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-04-W	ECTS points	4
Semester	winter	Language of instruction	english
Hours per week	4	Hours per semester	60
Objectives of the course	Acquisition of skills in shaping multifamily housing complexes based on various types and layouts of housing and the structure of apartments developed individually in the 5th semester in a specific urban situation. Adopting optimal compositional and artistic solutions for buildings and building complexes.		
Entry requirements	The student should actively participate in the design exercises. In particular, it should have advanced design studies in accordance with the schedule. It should also show alternative design proposals, and in case of inability to solve a given project problem, indicate the elements that have become the cause. The student should always have printouts enabling the basic recognition of the design solution he has adopted. If the correction is not concluded without a clear conclusion, he should stay in the room and repeat the conversation with the lecturer. Participation in periodic reviews of project work is compulsory.		
Course contents	<p>Exercise 1. Initial considerations regarding functional and spatial relationships in building complexes.</p> <p>Exercise 2. Housing systems.</p> <p>Exercise 3. Evaluation of housing systems.</p> <p>Exercise 4. Area and surface indicators.</p> <p>Exercise 5. Isochron on pedestrian crossings in the residential area.</p> <p>Exercise 6. Basic building systems (1st overview of the progress of works).</p> <p>Exercise 7. Selection of the form of housing for the housing area.</p> <p>Exercise 8. Cultural determinants in the housing area.</p> <p>Exercise 9. Methods of developing housing.</p> <p>Exercise 10. The range of devices in the housing complex.</p> <p>Exercise 11. Scope of the final development of building systems (2nd overview of the progress of design works).</p> <p>Exercise 12. Adapting the residential area to the needs of disabled people.</p> <p>Exercise 13. Studying the silhouette of buildings for the housing area.</p> <p>Exercise 14. Circular and pedestrian communication in a residential area.</p> <p>Exercise 15. Approval of projects for final elaboration.</p>		

- Lecture 1. Areas of multi-family buildings in cities.
- Lecture 2. Ecological conditions of a residential environment. Climate, acoustics, landscape values.
- Lecture 3. Utilitarian values of the existing development. Demographic and social conditions.
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- Lecture 5. Functional and spatial arrangement of a housing complex.
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- Lecture 10. Forms of centers and commercial and service teams in the housing area.
- Lecture 11. Socio-cultural devices in the housing area.
- Lecture 12. Administration and technical service in the housing area.
- Lecture 13. Open areas in the housing area.
- Lecture 14. Communication.
- Lecture 15. Parking and service of cars in the housing area.

Assessment methods	<p>1. Lectures - an informative lecture with explanations as well as a didactic discussion at the final stage of the lecture. Students are also mobilized to project solutions on a regular basis.</p> <p>2. Exercises - the course in the subject is based on an independent study work and a design correction during the classes with the help of an academic teacher. A lot of attention is paid to the development of variant solutions.</p> <p>Lectures (semester 1th and 2th) - the condition to take the exam in the subject is participation in at least 4/5 the number of lectures, obtaining a positive assessment of project exercises, having notes prepared during lectures and conducting a source query in accordance with the guidelines given after the beginning classes in a given semester.</p> <p>Exercises (semester 1th and 2th) - participation in at least 4/5 of the number of project classes and preparation of a project study in any graphics technique, consistent with the content of the subject, is a prerequisite for getting a pass. You should also have sketches and studies created for the semester review of the project work. The evaluation takes into account the substantive value (60% of the weight) and the aesthetic design (20%) as well as the novelty of functional and spatial solutions of the apartments as well as the aesthetic and compositional façades (20%).</p>
Recommended readings	<p>1. Alexander Ch., A Patern Language - Towns, Buildings, Construction, Oxford University Press, New York, 1977</p> <p>2. Borer P., Harris C., The Whole House Book. Ecological building design & materials, The Centre for Alternative Technology, Machynlleth, 1998</p> <p>3. Falkenberg H., Ecoarchitecture. Urban style, Evergreen GmbH, Koeln, 2008</p> <p>4. McCamant K., Durrett Ch., Cohousing. A Contemporary Approach to Housing Ourselves, Ten Speed Press, Berkeley, 1998</p>
Knowledge	<p>Ability to design and integrate functions, structural systems and architectural forms of multifamily houses and estates.</p> <p>Understanding of spatial and social patterns, inquiry designing processes to organize living space effectively with use of various tools and virtual simulations methods.</p> <p>Ability to produce appropriate architectural project presentation, precise technical drawings and specifications, 3D models and visualizations</p>
Skills	<p>Ability to design and integrate functions, structural systems and architectural forms of multifamily houses and estates.</p> <p>Understanding of spatial and social patterns, inquiry designing processes to organize living space effectively with use of various tools and virtual simulations methods.</p> <p>Ability to produce appropriate architectural project presentation, precise technical drawings and specifications, 3D models and visualizations</p>
Other social competences	<p>Ability to design and integrate functions, structural systems and architectural forms of multifamily houses and estates.</p> <p>Understanding of spatial and social patterns, inquiry designing processes to organize living space effectively with use of various tools and virtual simulations methods.</p> <p>Ability to produce appropriate architectural project presentation, precise technical drawings and specifications, 3D models and visualizations</p>

Course title	BASIC ARCHITECTURAL DESIGN - Lectures and exercises		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Leszek Świątek	E-mail address to the person	lswiatek@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-03-W	ECTS points	6
Semester	winter	Language of instruction	english
Hours per week	5	Hours per semester	75
Objectives of the course	Gaining knowledge about basic design mechanisms and processes, mastering a skill of variant modeling of processes and simulation in the created architectural space.		
Entry requirements	hand drawing and sketching abilities, basic CAD skills, imagination and creativity, simple models constructing, logic of arguments setting		
Course contents	Choice of the subject of small scale and range of description, an analysis of potential possibilities of design solution, an analysis of critical points, research on function variability and mobility, material solutions, an analysis of building structures in the context of contemporary technology accepted solutions. Choice of the subject of small scale and range of description, an analysis of potential possibilities of design solution, an analysis of critical points, research on function variability and mobility, material solutions, an analysis of building structures in the context of contemporary technology accepted solutions.		
Assessment methods	urban and, topographic analysis, elements of Life Cycle Assessment, Investment Ability Analysis, architectural composition selection, mapping and modelling Completing of term project (A3 format, min.4 large-scale illustrations and digital version on CD, saved in PDF extension) and a project book, containing drafts regarding project, inspirations and resources, presenting development of the work during the project exercises.		
Recommended readings	<ol style="list-style-type: none"> 1. Alexander Ch., A Patern Language - Towns, Buildings, Construction, Oxford University Press, New York,, 1977 2. Benyus J.M., Biomimicry. Innovation Inspired by Nature,, Harper Perennial, New York,, 1997 3. Daniels K., Low-Tech, Light-Tech, High-Tech. Building in the Information Age,, Birkhäuser Publishers, Basel,, 1999 4. Kibert J.Ch., Sustainable Construction. Green Building Design and Delivery,, John Wiley&Sons, New Jersey,, 2005 		
Knowledge	Student has ability to use CAD programs and appropriate 3D modelling programs to create conceptual architectural drawings, basic idea representation and project presentations		
Skills	Ability to design and integrate basic functions, structural systems and architectural forms of small scale buildings Understanding of spatial patterns and designing processes to organize space effectively with use of various tools and methods. Ability to produce appropriate architectural project presentation, precise technical drawings, 3D models and visualizations.		
Other social competences	Student understand consequences of architectural project intervention in built environment and has ability to change design strategy as a part of the complex system.		

Course title	BASIC ARCHITECTURAL DESIGN - One family houses - exercises		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Marek Wołoszyn	E-mail address to the person	Marek.Woloszyn@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-06-S	ECTS points	6
Semester	winter/summer	Language of instruction	english
Hours per week	5	Hours per semester	75
Objectives of the course	Gaining knowledge about basic design mechanisms and processes, mastering a skill of variant modeling of processes and simulation in the created architectural space.		
Entry requirements	Passing up the preceding subjects (or determining the required knowledge): required classes in the semester I, II and III.		
Course contents	<p>Choice of the type of one family dwelling , an analysis of potential possibilities of design solution, an analysis of critical points, research on function variability and mobility, material solutions, an analysis of building structures in the context of contemporary technology accepted solutions.</p> <p>Discussing exercises and handing out design topics.</p> <p>Discussing student projects of single-family housing estates.</p> <p>Analysis and selection of fragments of the housing estate (urban interior) in terms of their use for architectural exercises:</p> <p>a / analysis of natural and geographical conditions, sun exposure, wind rose, geomorphology, greenery;</p> <p>b / analysis of pro-social solutions;</p> <p>c / changes and corrections of existing buildings in a selected interior; (use of two types of buildings, selected for development);</p> <p>d / changes and corrections of communication solutions location of entrances and driveways - main, economic, etc., extension of roads, footbridges and pedestrians in connection with existing ones, car parks;</p> <p>e / conceptual sketches of solutions of a small urban complex (building line, outline of a block) in 1: 500 scale in three variants.</p> <p>f / specification of compositional guidelines resulting from locations worthy of "accentuation" (height, type of roof, location of entrances to the facility) 4</p> <p>Searching for the architectural concept of a building complex. Based on the axonometry or bird's perspective developed at home, develop three other variants of this perspective by changing the main architectural features of the objects in this team (different type of roofs, different type of architecture - open, dynamic, closed, static, etc.). Work should consist of from:</p> <p>1 - building variant with an open, dynamic plan;</p> <p>2 - a residential variant with a closed, static projection;</p> <p>3 - a variant of a projection with a symmetrical façade (classical);</p> <p>4 - solution of car and pedestrian communication (also within plots);</p> <p>5 - sketchy design of high, medium and low greenery.</p> <p>Develop the urban concept and the axonometry made at home on the white, variants of the house blocks within the designed team:</p> <p>1 variant - axonometry of a set of solids strongly associated with the site, green roofs "house inrush";</p> <p>2nd variant - axonometry of a set of solids related to the area, partly free ground floor, pole construction, "detached house";</p> <p>3rd variant - axonometry of the set of nodding masses previous assumptions: destruction, decomposition, dematerialization;</p> <p>Sketchy solid and functional search of buildings in 1: 100 scale</p> <p>SHAPE - FUNCTION</p> <p>For selected in axonometry solids, create outlines of individual storeys and arrange functions corresponding to previously accepted functional and surface assumptions. 4</p> <p>Evaluation of work and selection of concepts for further development.</p> <p>Development of projections and cross-section for a selected concept in 1: 100 scale.</p> <p>Variants of the projection solutions within the developed body.</p> <p>Consultations.</p> <p>Preparation of variant façade solutions as part of searching for the correct formal expression of the entire team.</p> <p>Correcting the entrance axis to buildings.</p> <p>Discussing the guidelines for the final urban and architectural design.</p> <p>Final correction of urban and architectural solutions, discussion of graphic designs.</p> <p>Evaluation and discussion of project proposals.</p> <p>Choosing a house for building studies.</p> <p>Selection of construction and building materials for external, internal walls: construction and partition walls, roof construction.</p> <p>Describe and sketch on the projections and cross-sections in 1: 100 scale structural elements of ceilings and roof trusses.</p> <p>Choosing a construction detail for development.</p> <p>Consultation with the lecturer.</p> <p>Correction of structural and ventilation elements.</p> <p>Development of the kitchen, living room, 1 bedroom and bathroom arrangement.</p> <p>Development of two variants of window openings of the façade.</p> <p>Correction.</p> <p>Presentation of variant material and color solutions on facades</p> <p>Corrections of the final solution.</p> <p>Discussion of the principles of graphic design of the project.</p>		

Working mockup of final project charts.
Correction of graphic designs.

Passing the project. Project evaluation according to the following criteria:

- for the completeness of the study 0-15 points;
- for the quality and diligence of developing 0-20 points;
- for solving the function of 0-20 points;
- for the values of architectural composition 0-30 points;
- for technical and material solutions 0-15 points

Assessment -

2.0 - less than 45 points;

3.0 - 45-60 points;

4.0 - 75-85 points;

4.5 - 85-95 points;

5.0 95-100 points

Agglomeration, and single-family housing, regulations applicable to the design and implementation of single-family houses

Types of single-family housing, shaping of small urban interiors.

Software and spatial guidelines for a single-family home.

Living room, kitchen, bathroom.

Searching for the idea of single-family houses by great architects of the 20th century.

Search for the idea of single-family houses by the great architects of the 20th century - the impact of currents and architectural styles.

Sustainable development, ecology and energy efficiency in construction:

- definitions of sustainable development;
- the construction style taking into consideration aspects of: - sustainable development, - ecology, - energy efficiency;
- material materials, and ecology.

Energy efficiency in construction:

- improvement of thermal insulation of external partitions;
- improvement of the use of conventional energy carriers;
- using alternative energy sources - solar energy in construction.

Systems of solar energy use in construction (photovoltaic, active -active, passive - passive, semi-active).

The influence of active and solar systems on the architecture of single-family houses.

Energy-efficient and passive construction:

energy-efficient houses, passive houses:

- energy-efficient houses, passive houses;

zoning of rooms - 5 principles of shaping functions in energy-efficient houses.

Breakdown of passive (passive) systems.

The impact of passive systems on the architecture of single-family houses:

- implementation of passive systems for construction;
- energy storage in passive systems.

Principles of presenting and visualizing a single family house project.

Written exam.

Assessment methods

Classes are based on study and project work during classes, at the beginning of which a project task is formulated, which should be solved by the method of subsequent approximations. At the beginning of the semester students are given the algorithm of design for all exercises. Individual corrections, homeworks, closures and progress reviews of project work are carried out.

Lectures: Application in the form of a condensed resource of knowledge necessary for project work carried out during the exercises,

as well as familiarization with the issues of sustainable design, in particular energy-saving.

Exercises: Students in a specific location are to develop a small urban-architectural interior consisting of several houses (at least two types), and then solve one of the selected houses in the form of an architectural concept with elements of a technical design in 1: 50 scale.

Precise definition of the subject of each exercise, which brings the student closer to the solution of the design subject.

Zajęcia polegają na pracy studialnej i projektowej na zajęciach, na początku których formułuje się zadanie projektowe, które winno być rozwiązane metodą kolejnych przybliżeń. Na początku semestru podaje się studentom algorytm postępowania projektowego na wszystkie ćwiczenia. Prowadzone są indywidualne korekty, zadania domowe, zadania klauzurowe i przeglądy zaawansowania prac projektowych.

Wykłady: Podanie w formie skondensowanej zasobu wiedzy niezbędnej dla prac projektowych prowadzonych na ćwiczeniach,

a także zapoznanie z zagadnieniami projektowania zrównoważonego, w szczególności energooszczędnego.

Ćwiczenia: Studenci na konkretnej lokalizacji mają opracować małe wnętrza urbanistyczno-architektoniczne składające się z kilku domów (co najmniej dwóch typów), a następnie rozwiązać jeden z wybranych domów w formie koncepcji architektonicznej z elementami projektu technicznego w skali 1 : 50.

Precyzyjne określenie tematyki każdego ćwiczenia, które przybliży studenta do rozwiązania tematu projektowego.

Completing of term project (A3 format, min.4 large-scale illustrations and digital version on CD, saved in PDF extension) and a project book, containing drafts regarding project, inspirations and resources, presenting development of the work during the project exercises.

Completion of the exercises is based on: grades from control closures (35%) and evaluation of the project ending the given semester (65%). The final project developed is a work that presents both the correctness of the solution to the design problem as well as the technical and artistic skills of the student.

Passing the project. Project evaluation according to the following criteria:

- for the completeness of the study 0-15 points;
- for the quality and diligence of developing 0-20 points;
- for solving the function of 0-20 points;
- for the values of architectural composition 0-30 points;
- for technical and material solutions 0-15 points

Assessment -

- 2.0 - less than 45 points;
- 3.0 - 45-60 points;
- 4.0 - 75-85 points;
- 4.5 - 85-95 points;
- 5.0 - 95-100 points

Recommended readings	<ol style="list-style-type: none">1. Manuel Gausa, Jaime Salazar, Single-family housing, Springer Science & Business Media, 20052. Christian Schittich, Ingrid Geisel, Single Family Houses: Concepts, Planning, Construction, Edition Detail, 20003. Virginia McLeod, Detail in Contemporary Residential Architecture, Laurence King Publishing, 2012
Knowledge	<p>The student learns the principles of engineering graphic recording. He can read architectural design and work using computer programs.</p> <p>The student got acquainted with building materials and can apply them in the project.</p> <p>The student learned the basics of form construction, spatial composition and relations between elements shaping the space.</p> <p>The student got acquainted with socio-psychological determinants in architectural and urban design.</p> <p>The student got acquainted with the principles of the art of construction and standards applicable in architectural design.</p>
Skills	<p>Understanding of spatial and social patterns, inquiry designing processes to organize living space effectively with use of various tools and virtual simulations methods.</p> <p>Ability to design and integrate functions, structural systems and architectural forms of one family houses and estates.</p> <p>Ability to produce appropriate architectural project presentation, precise technical drawings and specifications, 3D models and visualizations.</p> <p>The student can present his / her project in an attractive form of expression.</p> <p>Student is able to design settlement teams of various types and scales.</p>
Other social competences	<p>Student wykazuje przedsiębiorczość i inwencję w myśleniu i działaniu.</p> <p>Student jest odpowiedzialny za własną pracę, zachowuje się profesjonalnie i przestrzega etyki zawodowej.</p>

Course title	Computer Aided Design 3D-Deepening Course I		
Level of course	first cycle		
Teaching method	laboratory course		
Person responsible for the course	Kamila Nowak	E-mail address to the person	knowak@zut.edu.pl
Course code (if applicable)	WBiA-AiU-07-W	ECTS points	4
Semester	winter	Language of instruction	english
Hours per week	4	Hours per semester	60
Objectives of the course	Professional Modeling in Archicad. Ability to perform design documentation in a Archicad environment. Ability to perform visualization in Archicad.		
Entry requirements	Knowledge of descriptive geometry, in particular the principle of projection and perspective.		
Course contents	Professional 2D and 3D modeling in the Archicad program. Creating facades, cross-sections and wall cladding. Creating own structures of building partitions such as a wall and ceiling. Creating technical documentation. Creating professional visualizations, putting your own materials, setting lights and cameras.		
Assessment methods	Working on individual tasks in the computer lab (continuous assessment). Evaluation of the design task prepared as homework (project work). Evaluation of presentation boards and models made during the semester (grade). Working on individual tasks in the computer lab. Evaluation of the design task prepared as homework. Evaluation of presentation boards and models made during the semester		
Recommended readings	1. Dassault Systemes SOLIDWORKS Corporation, SOLIDWORKS Advanced Part Modeling, 2015 2. Dassault Systemes SolidWorks Corporation, Photorealistic Rendering Using SolidWorks and PhotoView, 2013 3. Sham Tickoo, SolidWorks for Designers Release 200, Purdue University Calumet, 2006 4. Ruiz Alex, SolidWorks 2010 (ebook), John Wiley & Sons, 2010		
Knowledge	Has knowledge of the methodology of designing spatial forms based on solid modeling. Has knowledge in the field of object visualization, including methodology of presentation using computer-aided		
Skills	Is able to apply selected methods of modeling geometric elements to the needs of his project. Can quickly generate visualizations of 3D objects by controlling environmental and lighting parameters in Archicad.		
Other social competences	Independently undertakes design issues of his choice		

Course title	Computer Aided Design 3D-Deepening Course II		
Level of course	first cycle		
Teaching method	laboratory course		
Person responsible for the course	Kamila Nowak	E-mail address to the person	knowak@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-08-S	ECTS points	4
Semester	summer	Language of instruction	english
Hours per week	4	Hours per semester	60
Objectives of the course	Professional Modeling in Archicad. Ability to perform design documentation in a Archicad environment. Ability to perform visualization in Archicad.		
Entry requirements	Knowledge of descriptive geometry, in particular the principle of projection and perspective.		
Course contents	Professional 2D and 3D modeling in the Archicad program. Creating facades, cross-sections and wall cladding. Creating own structures of building partitions such as a wall and ceiling. Creating technical documentation. Creating professional visualizations, putting your own materials, setting lights and cameras.		
Assessment methods	Working on individual tasks in the computer lab (continuous assessment). Evaluation of the design task prepared as homework (project work). Evaluation of presentation boards and models made during the semester (grade). Working on individual tasks in the computer lab. Evaluation of the design task prepared as homework. Evaluation of presentation boards and models made during the semester		
Recommended readings	1. Dassault Systemes SOLIDWORKS Corporation, SOLIDWORKS Advanced Part Modeling, 2015 2. Dassault Systemes SolidWorks Corporation, Photorealistic Rendering Using SolidWorks and PhotoView, 2013 3. Sham Tickoo, SolidWorks for Designers Release 200, Purdue University Calumet, 2006 4. Ruiz Alex, SolidWorks 2010 (ebook), John Wiley & Sons, 2010		
Knowledge	Has knowledge of the methodology of designing spatial forms based on solid modeling. Has knowledge in the field of object visualization, including methodology of presentation using computer-aided		
Skills	Is able to apply selected methods of modeling geometric elements to the needs of his project. Can quickly generate visualizations of 3D objects by controlling environmental and lighting parameters in Archicad.		
Other social competences	Independently undertakes design issues of his choice		

Course title	Computer Aided Design 3D - introductory course I		
Level of course	first cycle		
Teaching method	laboratory course		
Person responsible for the course	Kamila Nowak	E-mail address to the person	knowak@zut.edu.pl
Course code (if applicable)	WBIA-AiU-1-09-W	ECTS points	3
Semester	winter	Language of instruction	english
Hours per week	3	Hours per semester	45
Objectives of the course	<p>Basic model in Archicad.</p> <p>Ability to perform design documentation in a Archicad environment.</p> <p>Ability to perform visualization in Archicad.</p>		
Entry requirements	Knowledge of plotted geometry, in particular the principle of projection and perspective.		
Course contents	<p>Realization of complex solid operations in many variants. Introduction to modeling in Archicad.</p> <p>Introduction of reference geometry in the development of multi-profile drawings using curves. Use of squeeze and split operations.</p> <p>Mastering the rules for creating reference geometry and its methodology. Introduction to 3D sketching.</p> <p>Execution of selected design tasks.</p>		
Assessment methods	<p>Discuss and issuing commands to execute programming instructions CAD.</p> <p>The practical task in the CAD classroom.</p> <p>Correction task by editing CAD.</p> <p>Working on individual tasks in the computer lab.</p> <p>Evaluation of the design task prepared as homework.</p> <p>Evaluation of presentation boards and models made during the semester</p>		
Recommended readings	<ol style="list-style-type: none"> 1. Dassault Systemes SOLIDWORKS Corporation, SOLIDWORKS Advanced Part Modeling, 2015 2. Dassault Systemes SolidWorks Corporation, Photorealistic Rendering Using SolidWorks and PhotoView, 2013 3. Sham Tickoo, SolidWorks for Designers Release 2005, Purde University Calumet, 2006 4. Ruiz Alex, SolidWorks 2010 (ebook), John Wiley & Sons, 2010 		
Knowledge	knows systematic methods of designing as a key element in design and understands their importance in the design process. understands the basic issues of creativity and creativity		
Skills	<p>Knows how to independently find and apply the adequate spatial presentation of the design project, based on both traditional and advanced modeling methods.</p> <p>Realization of complex solid operations in many variants. Introduction to modeling in Archicad.</p> <p>Introduction of reference geometry in the development of multi-profile drawings using curves. Use of squeeze and split operations.</p> <p>Mastering the rules for creating reference geometry and its methodology. Introduction to 3D sketching.</p> <p>Execution of selected design tasks.</p>		
Other social competences	Is able to think creatively, easily creates ideas and is ready to change the mindset of thinking, at the same time is able to recognize and avoid limitations on creative abilities; quickly acquires new information, being able to skillfully filter and index it, is able to operate under pressure of criticism and time.		

Course title	Computer Aided Design 3D - introductory course II		
Level of course	first cycle		
Teaching method	laboratory course		
Person responsible for the course	Kamila Nowak	E-mail address to the person	knowak@zut.edu.pl
Course code (if applicable)	WBIA-AiU-1-010-S	ECTS points	3
Semester	summer	Language of instruction	english
Hours per week	3	Hours per semester	45
Objectives of the course	<p>Basic model in Archicad.</p> <p>Ability to perform design documentation in a Archicad environment.</p> <p>Ability to perform visualization in Archicad.</p>		
Entry requirements	Knowledge of plotted geometry, in particular the principle of projection and perspective.		
Course contents	<p>Realization of complex solid operations in many variants. Introduction to modeling in Archicad.</p> <p>Introduction of reference geometry in the development of multi-profile drawings using curves. Use of squeeze and split operations.</p> <p>Mastering the rules for creating reference geometry and its methodology. Introduction to 3D sketching.</p> <p>Execution of selected design tasks.</p>		
Assessment methods	<p>Discuss and issuing commands to execute programming instructions CAD.</p> <p>The practical task in the CAD classroom.</p> <p>Correction task by editing CAD.</p> <p>Working on individual tasks in the computer lab.</p> <p>Evaluation of the design task prepared as homework.</p> <p>Evaluation of presentation boards and models made during the semester</p>		
Recommended readings	<ol style="list-style-type: none"> 1. Dassault Systemes SOLIDWORKS Corporation, SOLIDWORKS Advanced Part Modeling, 2015 2. Dassault Systemes SolidWorks Corporation, Photorealistic Rendering Using SolidWorks and PhotoView, 2013 3. Sham Tickoo, SolidWorks for Designers Release 2005, Purde University Calumet, 2006 4. Ruiz Alex, SolidWorks 2010 (ebook), John Wiley & Sons, 2010 		
Knowledge	knows systematic methods of designing as a key element in design and understands their importance in the design process. understands the basic issues of creativity and creativity		
Skills	<p>Knows how to independently find and apply the adequate spatial presentation of the design project, based on both traditional and advanced modeling methods.</p> <p>Realization of complex solid operations in many variants. Introduction to modeling in Archicad.</p> <p>Introduction of reference geometry in the development of multi-profile drawings using curves. Use of squeeze and split operations.</p> <p>Mastering the rules for creating reference geometry and its methodology. Introduction to 3D sketching.</p> <p>Execution of selected design tasks.</p>		
Other social competences	Is able to think creatively, easily creates ideas and is ready to change the mindset of thinking, at the same time is able to recognize and avoid limitations on creative abilities; quickly acquires new information, being able to skillfully filter and index it, is able to operate under pressure of criticism and time.		

Course title	Construction design - Statics and mechanics of structures		
Level of course	first cycle		
Teaching method	laboratory course / lecture		
Person responsible for the course	Olga Kopczyńska	E-mail address to the person	okopczynska.zut.edu.pl
Course code (if applicable)	WA-Con_des	ECTS points	3
Semester	winter/summer	Language of instruction	english
Hours per week	3	Hours per semester	45
Objectives of the course	Getting to know the basic moves and issues in the statics and strength of materials. Developing the ability to prepare diagrams of cross-sectional forces in beams, frames and trusses. Mastering the skill of initial dimensioning of structure elements in terms of the ultimate limit state		
Entry requirements	Fundamentals of physics and mathematics		
Course contents	Equations, calculations, determination of forces, determination of static moments, bending, compression - steel, concrete, wood Structural theory issues, principles of structure design. Actions on structures, loads, diagrams of structural systems, definitions, force diagrams, frame systems, trusses, stress states.		
Assessment methods	The student is aware of the need for self-development, professional responsibility, understands the need to cooperate with an inter-industry team. Informative lecture, design exercises Test Exam		
Recommended readings	1. Barry S. Onouye, Statics And Strength Of Materials For Architecture And Building Construction: Pearson New International Edition, Pearson Higher Ed, 2013		
Knowledge	Students knows and understands the theoretical foundations of Construction Design		
Skills	Student is able to design simple elements of reinforced construction.		
Other social competences	The student understands the need for lifelong learning.		

Course title	Construction systems		
Level of course	first cycle		
Teaching method	lecture		
Person responsible for the course	Olga Kopczyńska	E-mail address to the person	okopczynska.zut.edu.pl
Course code (if applicable)	WA/Co-sys/12	ECTS points	2
Semester	winter/summer	Language of instruction	polish
Hours per week	2	Hours per semester	30
Objectives of the course	The student is able to design a simple wooden, steel or reinforced concrete (concrete) structure. The student can read and interpret a structural design.		
Entry requirements	The student knows and understands the basics of structure design, knows construction materials, knows and understands the issues of structural durability.		
Course contents	<ol style="list-style-type: none"> 1. Introduction to the subject. 2. Basic information on construction materials: wood, steel, concrete. 3. Principles of designing basic elements of wooden, steel and concrete structures. 4. Standards and regulations for designing the structure of objects. 5. Securing elements of building constructions. 6. Reading and interpretation of construction projects. 7. Design of a simple structure of a wooden, steel or reinforced concrete object. 		
Assessment methods	<p>The student is aware of the need for self-development, professional responsibility, understands the need to cooperate with an inter-industry team.</p> <p>Informative lecture, design exercises</p>		
Recommended readings	<ol style="list-style-type: none"> 1. Design of Structural Elements, Spon, 2009 2. Morris, L.J. & Plum, D.R., Structural Steelwork Design to BS5950, Prentice Hall, 2nd Edition 		
Knowledge	Students knows and understands the theoretical foundations of Construcion Systems.		
Skills	Design and detailing of basic reinforced in the construction systems.		
Other social competences	The student understands the need for lifelong learning.		

Course title	Design BIM objects for architecture		
Level of course	first cycle		
Teaching method	laboratory course / lecture		
Person responsible for the course	Dorota Janisio-Pawłowska	E-mail address to the person	dorota.pawlowska@zut.edu.pl
Course code (if applicable)	WA-bim-ob-arch	ECTS points	3
Semester	winter/summer	Language of instruction	polish
Hours per week	3	Hours per semester	45
Objectives of the course	Basic knowledge of BIM processes Ability to use CAD programs in BIM technology BIM modeling rules		
Entry requirements	Knowledge of issues in the field of general construction General knowledge of the applicable technical conditions that should be met by buildings and their location		
Course contents	modeling BIM objects for architecture, preparing a set of objects using CAD programs / 10 hours modeling and cooperation between programs / 10 hours preparation objects of various details LOD / 5 hours creating object cards, / 5 hours modeling BIM objects for architecture, preparing a set of objects using CAD programs / 2 hours modeling and cooperation between programs / 4 hours preparation of objects of various details LOD / 5 hours creating object cards / 1 hour visualization of BIM objects / 3 hours		
Assessment methods	Lecture and introductory exercises Problem lecture, conversation lecture, practical exercises Lecture and exercises using specialized CAD and BIM software Mandatory presence Completing a semester task based on the use of BIM technology		
Recommended readings	1. Karen M. Kensek, Douglas E. Noble, Building Information Modeling - BIM in current and future Practice, Wiley, USA, 2014		
Knowledge	Students knows and understands the theoretical foundations of BIM objects for architecture.		
Skills	Design and detailing of basic reinforced BIM objects in architecture.		
Other social competences	Student is able to design simple elements of design BIM objects.		

Course title	Documentation and technical detailing in architectural drawing		
Level of course	first cycle		
Teaching method	laboratory course		
Person responsible for the course	Piotr Gradziński	E-mail address to the person	pgradzinski
Course code (if applicable)	WA-2021-DokTech	ECTS points	2
Semester	winter/summer	Language of instruction	polish
Hours per week	2	Hours per semester	30
Objectives of the course	Gaining knowledge about basic design mechanisms and processes, mastering a skill of variant modeling of processes and simulation in the created architectural space.		
Entry requirements	Choice of the subject of various scales and range of description, an analysis of potential possibilities of design solution, an analysis of critical points, research on function variability and mobility, material and energy efficiency solutions, an analysis of building structures in the context of the life cycle and ecological profile for the accepted solutions. Base for thesis formulation. Passing up the preceding subjects (or determining the required knowledge): required classes in the semester I, II and III.		
Course contents	The task is to present new, innovative solutions related to adding individual structural elements to a new or remodeled building. Describing the detail with a technical drawing. Substantive support and inspiration in the design of various types of public, private or official buildings, both inside and outside. Enrichment of the architectural and design dictionary 1. Basic design principles and all digital modern architectural and engineering design paradigms 2. Documentation principles available for various design related tasks 3. Integrated system to conduct all design using the paradigms and digital tools		
Assessment methods	Classes are based on study and project work during classes, at the beginning of which a project task is formulated, which should be solved by the method of subsequent approximations. At the beginning of the semester students are given the algorithm of design for all exercises. Individual corrections, homeworks, closures and progress reviews of project work are carried out. Precise definition of the topic of each exercise, which brings the student closer to the solution of the project topic. As a result of the course, the student should be able to determine the types of technical, technological and material solutions present in construction. In particular, he should be able to determine their durability and usefulness. The basis for passing the course is to present an CAD documentation notebook with drawing solutions and a description. Completing of term project (A3 format, min.4 large-scale illustrations and digital version on CD, saved in PDF extension) Project book, containing drafts regarding project of details, of the building by documentation. Should have the inspirations and resources, presenting development of the work during the project exercises and description.		
Recommended readings	1. Technical Documentation and Process, Jerry C Whitaker, Robert K. Mancini, 2012 2. GEOFFREY MAKSTUTIS, DESIGN PROCESS IN ARCHITECTURE: FROM CONCEPT TO COMPLETION, LAURENCE KING PUBLISHING		
Knowledge	Students knows and understands the foundations of documentations and technical detailing.		
Skills	Student shows skills in design documentation and detailing.		
Other social competences	The student understands the need for lifelong learning.		

Course title	Ergonomy. Health and Safety.		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Marek Ostrowski	E-mail address to the person	mostrowski@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-011-W	ECTS points	4
Semester	winter	Language of instruction	english
Hours per week	4	Hours per semester	60
Objectives of the course	<p>The acquisition of basic knowledge about human, his physical and sensory efficiency and about factors affecting the quality of life in the developed environment.</p> <p>The acquisition of the ability to apply the ergonomic knowledge and the ergonomic analysis criteria into the architectural and interior design and public spaces.</p> <p>Developing empathy for the needs of the disabled users of the space.</p>		
Entry requirements	Basic knowledge of the architectural design, geometry and building materials		
Course contents	<p>The project of the reception area for two employees with maximum 9 square meters floor area: equipped with the necessary equipment (computer, telephone, fax, printer), adjusted for three groups of phantom users, including people in a wheelchair.</p> <p>The analysis of the adjustment of the public space or the public utility buildings for the physically disabled people and the blind.</p> <p>Ergonomics in the architectural design and in everyday life of the users of the space. Engineering knowledge about the human body. Anthropometry, biomechanics, physiology of the sensory organs. The determinants of the efficiency of sight. Work post at the computer and the optimization of the workplace.</p> <p>Spatial environment of the life of people with disabilities. The accessibility of the public spaces and facilities for the people with disabilities and the blind. The ergonomics of housing and sanitary premises.</p>		
Assessment methods	<p>Lecture information using a multimedia presentation</p> <p>Group and individual correction of projects</p> <p>Exercises involving the enclosed independent problem solving ergonomic and discussing their results</p> <p>Periodical check-ups of the creative use of ergonomic knowledge by the students in a form of design tasks.</p> <p>Transitional evaluation of the state of progress of the projects.</p> <p>Final evaluation of the seminar consists of the evaluation of two enclosure projects, one review of the state of progress of the projects and the assessment of the two design tasks.</p> <p>The completion of the lecture is based on the attendance list and the verification test.</p>		
Recommended readings	<ol style="list-style-type: none"> Alexander Ch., A Patern Language - Towns, Buildings, Construction, Oxford University Press, New York, 1977 Grandjean, E., Ergonomics of the Home, Wiley, New Jersey, 1973 Grandjean, E., Ergonomics In Computerized Offices, Taylor & Francis Ltd., London, 2003 Salvendy G., Handbook of Human Factors and Ergonomics, Wiley, New Jersey, 2012 Tilley A. R., The Measure of Man and Woman: Human Factors in Design, Wiley, New York, 2002 		
Knowledge	<p>The student knows the objectives and tasks of ergonomics and areas of its application; he knows the basic categories of human motor and sensory disabilities; he knows the principles of anthropometric measurements; he has basic knowledge of biomechanical and physiological conditions of human body fitness.</p> <p>The student knows the methods of ergonomic optimization of computer workstations; he knows the principles of universal design;</p>		
Skills	<p>Student has knowledge about the determinants of the efficiency of the human body, knows the basic categories of human physical disability and ways and methods of adapting objects and spatial elements to meet the needs of users. Student can use the phantoms and anthropometric data and perform analysis of ergonomic workstations.</p> <p>Student does not create solutions discriminatory, prejudicial to the dignity and human rights. Works to improve the quality of the human environment.</p>		
Other social competences	The student avoids discriminatory solutions that undermine the sense of dignity and human rights and works to improve the quality of human life.		

Course title	Heritage Protection		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Jakub Gołębiowski	E-mail address to the person	Jakub.Golebiewski@zut.edu.pl
Course code (if applicable)	WBiA-AIU-1-023W	ECTS points	4
Semester	winter	Language of instruction	english
Hours per week	4	Hours per semester	60
Objectives of the course	<p>Preparation for the architectural design in the build environment</p> <p>Developing skills, methods and rules in design of adaptations of historic buildings</p> <p>Developing methods and rules in protection, preservation and contemporary areal transformations within the monumental protection areas</p>		
Entry requirements	Student have to be absolvent of engineer studies (S1)		
Course contents	<p>Scientific description of historical and iconographic research. Conceptual design of adaptation of a building under protection for a new functions or design of a new object in a historic context, including historical conditions and conservation guidelines.</p> <p>History of protection and conservation of historical ensembles and cultural landscape</p> <p>Theories and methods of revalorization of historical ensembles</p>		
Assessment methods	<p>Detailed elaboration of design drawings, including dimensioning, architectural detail and technical solution.</p> <p>information based lecture</p> <p>problem based lecture</p> <p>active presence at the design classes and lectures</p> <p>evaluation of individual input of the student into the elaboration of the chosen exam topic</p>		
Recommended readings	<ol style="list-style-type: none"> 1. Fitch, James Marston, Historic Preservation: Curatorial Management of the Built World, University Press of Virginia, Charlottesville, VA, 1990 2. Munoz Vinas, Contemporary Theory of Conservation, Elsevier/Butterworth Heinemann, Amsterdam, 2005 3. Stipe, Robert E. (ed.), A Richer Heritage: Historic Preservation in the Twenty-First Century, The University of North Carolina Press, Chapel Hill, NC, 2003 4. Tyler, Norman, Ted J. Ligibel, and Ilene R. Tyler, Historic Preservation: An Introduction to its History, Principles, and Practice, W.W. Norton & Company, New York, 2009 		
Knowledge	Student has knowledge about the history and philosophy of monument protection, has knowlage of law and rules in this area and duties of a designer who is working in the protected areas.		
Skills	Student has ability to prepare conservation and renovation projects. Student has knowlage how to design adaptation and transformation of historical objects under conservation protection.		
Other social competences	The student is aware of the value of cultural heritage, including especially the heritage of Polish culture and foreign cultures. The student understands non-technical aspects of the impact of heritage protection. The student understands the links between heritage protection and improving the quality of life and the environment.		

Course title	Information Technology I		
Level of course	first cycle		
Teaching method	laboratory course		
Person responsible for the course	Kamila Nowak	E-mail address to the person	knowak@zut.edu.pl
Course code (if applicable)	WBIA-AiU-KWZ-1-012-W	ECTS points	2
Semester	winter	Language of instruction	english
Hours per week	2	Hours per semester	30
Objectives of the course	<p>Knowledge and practical ability to use information technology.</p> <p>Basic parametric modeling in the field of design design and the ability to perform basic project documentation in a SolidWorks environment.</p>		
Entry requirements	<p>Knowledge of geometry, principle of projection and perspective, knowledge of computer software. The basics of the scope of European computer skills (ECDL, ICT)</p>		
Course contents	<p>Using drawing sheet and selecting a sheet format in SolidWorks environment. Inserting parts into a sheet. Projection views, display options, drawing dimensions on the sheet, section views, model views, details, surface finish information, information tables.</p> <p>Changing parameters in the sheet, and rebuilding the part model. An operation to extract an add / base with a slant and to enter a sweep operation on a path.</p> <p>Introduction to the sketch repair. Create a sketch with the tools: convert, offset, and spline. Creating new planes necessary for modeling the solid. Modeling of a part consisting of multibody solids. Exercises to deepen the knowledge of visualization in PhotoView 360.</p>		
Assessment methods	<p>Discuss and issuing commands to execute programming instructions CAD.</p> <p>The practical task in the CAD classroom.</p> <p>Correction task by editing CAD.</p> <p>Working on individual tasks in the computer lab.</p> <p>Evaluation of the design task prepared as homework.</p> <p>Evaluation of presentation boards and models made during the semester</p>		
Recommended readings	<ol style="list-style-type: none"> 1. Dassault Systemes SOLIDWORKS Corporation, SOLIDWORKS Advanced Part Modeling, 2015 2. Dassault Systemes SolidWorks Corporation, Photorealistic Rendering Using SolidWorks and PhotoView, 2013 3. Sham Tickoo, SolidWorks for Designers Release 2005, Purdue University Calumet, 2006 4. Ruiz Alex, SolidWorks 2010 (ebook), John Wiley & Sons, 2010 		
Knowledge	<p>Has general knowledge of a design workshop in the field of design. At the basic level, he is fully aware of the means of expression and workshop skills in visual arts.</p> <p>He knows the key to systematic design methods in general and understands their importance in the provost process. Understands the basic issues of the theory of creativity and creativity.</p>		
Skills	<p>Student can independently find and apply an adequate methodical model, can adapt tools and design techniques to a specific situation in Solidworks.</p> <p>It is capable of formulating and methodically applying basic design criteria and making design decisions based on them.</p> <p>Student can work in a group.</p>		
Other social competences	<p>Independently undertakes independent project activities, effectively implementing and presenting them.</p> <p>Is able to think creatively, easily creates ideas and is ready to change the mindset of thinking, at the same time is able to recognize and avoid limitations on creative abilities; quickly acquires new information, being able to skillfully filter and index it, is able to operate under pressure of criticism and time.</p>		

Course title	Information Technology II		
Level of course	first cycle		
Teaching method	laboratory course		
Person responsible for the course	Kamila Nowak	E-mail address to the person	knowak@zut.edu.pl
Course code (if applicable)	WBIA-AiU-KWZ-1-013-S	ECTS points	2
Semester	summer	Language of instruction	english
Hours per week	2	Hours per semester	30
Objectives of the course	<p>Knowledge and practical ability to use information technology.</p> <p>Basic parametric modeling in the field of design design and the ability to perform basic project documentation in a SolidWorks environment.</p>		
Entry requirements	<p>Knowledge of geometry, principle of projection and perspective, knowledge of computer software. The basics of the scope of European computer skills (ECDL, ICT)</p>		
Course contents	<p>Using drawing sheet and selecting a sheet format in SolidWorks environment. Inserting parts into a sheet. Projection views, display options, drawing dimensions on the sheet, section views, model views, details, surface finish information, information tables.</p> <p>Changing parameters in the sheet, and rebuilding the part model. An operation to extract an add / base with a slant and to enter a sweep operation on a path.</p> <p>Introduction to the sketch repair. Create a sketch with the tools: convert, offset, and spline. Creating new planes necessary for modeling the solid. Modeling of a part consisting of multibody solids. Exercises to deepen the knowledge of visualization in PhotoView 360.</p>		
Assessment methods	<p>Discuss and issuing commands to execute programming instructions CAD.</p> <p>The practical task in the CAD classroom.</p> <p>Correction task by editing CAD.</p> <p>Working on individual tasks in the computer lab.</p> <p>Evaluation of the design task prepared as homework.</p> <p>Evaluation of presentation boards and models made during the semester</p>		
Recommended readings	<ol style="list-style-type: none"> 1. Dassault Systemes SOLIDWORKS Corporation, SOLIDWORKS Advanced Part Modeling, 2015 2. Dassault Systemes SolidWorks Corporation, Photorealistic Rendering Using SolidWorks and PhotoView, 2013 3. Sham Tickoo, SolidWorks for Designers Release 2005, Purdue University Calumet, 2006 4. Ruiz Alex, SolidWorks 2010 (ebook), John Wiley & Sons, 2010 		
Knowledge	<p>Has general knowledge of a design workshop in the field of design. At the basic level, he is fully aware of the means of expression and workshop skills in visual arts.</p> <p>He knows the key to systematic design methods in general and understands their importance in the provost process. Understands the basic issues of the theory of creativity and creativity.</p>		
Skills	<p>Student can independently find and apply an adequate methodical model, can adapt tools and design techniques to a specific situation in Solidworks.</p> <p>It is capable of formulating and methodically applying basic design criteria and making design decisions based on them.</p> <p>Student can work in a group.</p>		
Other social competences	<p>Independently undertakes independent project activities, effectively implementing and presenting them.</p> <p>Is able to think creatively, easily creates ideas and is ready to change the mindset of thinking, at the same time is able to recognize and avoid limitations on creative abilities; quickly acquires new information, being able to skillfully filter and index it, is able to operate under pressure of criticism and time.</p>		

Course title	Interior design - visualizations and animations		
Level of course	first cycle		
Teaching method	laboratory course / lecture		
Person responsible for the course	Wojciech Pawłowski	E-mail address to the person	Wojciech.Pawlowski@zut.edu.pl
Course code (if applicable)	WA-Int_des	ECTS points	3
Semester	winter/summer	Language of instruction	english
Hours per week	3	Hours per semester	45
Objectives of the course	Gaining knowledge about basic design mechanisms and processes, mastering a skill of variant modeling of processes and simulation in the created architectural space.		
Entry requirements	Passing up the preceding subjects (or determining the required knowledge): required classes in the semester I, II and III.		
Course contents	<p>preparation of an interior design based on an already existing architectural design</p> <p>preparation of an inventory for the needs of the interior</p> <p>development of the interior reconstruction program, preparation of drawing layouts / work based on the CAD program</p> <p>designing library elements for the interior, e.g. lamps, furniture, decorative elements, wall finishing structures, interior details / based on the CAD program</p> <p>preparation of documentation for the selected interior based on the CAD program</p> <p>preparation of interior presentation based on the CAD program</p> <p>preparation of the scene in the CAD program for the purposes of visualization / work based on the CAD program</p> <p>work on the visualization of the scene based on visualization programs, discussion of selected programs for visualization and animation in interiors</p> <p>indoor and outdoor scene settings for the selected interior</p> <p>artificial daylight settings / based on the selected visualization and animation program</p> <p>material settings / creating your own materials / based on the selected program for visualization and animation</p> <p>working with library elements / downloading library elements creating own groups / based on a selected program for visualization and animation</p> <p>framing scenes / setting visualization parameters / based on the selected visualization and animation program</p> <p>graphic design of selected scenes / post-processing options for the selected frame / based on the selected visualization and animation program</p> <p>preparation of animations / creating short clips / combining clips / creating transitions between clips / based on the selected visualization and animation program</p> <p>Principles of interior design on examples of selected rooms</p> <p>Tools supporting the workshop of an interior designer</p> <p>Designing structures and spatial elements in interiors</p> <p>Interior design and visualization support programs</p> <p>The process of creating scenes in interior visualization</p> <p>Creating materials and textures for interior visualization /</p> <p>Preparation of animation / creating short clips / combining clips / creating transitions between clips / based on the selected visualization and animation program /</p>		
Assessment methods	<p>As a result of the course, the student should be able to determine the types of technical, technological and material solutions present in construction. In particular, he should be able to determine their durability and usefulness. The basis for passing the course is to present an A4 notebook with drawing solutions and a description.</p> <p>Active presence at the design classes and lectures</p> <p>evaluation of individual input of the student into the elaboration of the chosen exam topic</p>		
Recommended readings	1. Dassault Systemes SolidWorks Corporation, Photorealistic Rendering Using SolidWorks and PhotoView, 2013		
Knowledge	Students knowns and understands the theoretical foundations of Interior Design and visualisation, animation.		
Skills	Design and detailing of basic foundations of Interior Design and visualisation, animation.		
Other social competences	The student understands the need for lifelong learning.		

Course title	Introduction to architectural design I		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Leszek Świątek	E-mail address to the person	lswiatek@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-014-W	ECTS points	4
Semester	winter	Language of instruction	english
Hours per week	4	Hours per semester	60
Objectives of the course	<p>The aim of the course is to develop basic skills in forming the composition of the solid buildings, creating simple functional - spatial systems and learning basic principles of architectural design.</p> <p>Ability to formulate the functional and spatial program.</p> <p>Understanding the basic principles of creating architectural form.</p> <p>Achieving harmonious outcomes from the premises of location and existing architectural objects.</p> <p>Presentation of programming that complements existing urban organisms or settlement.</p>		
Entry requirements	A positive result of recruitment to study architecture.		
Course contents	<p>Exercise: Designing public space management arranged by cubature architectural objects and buildings with simple utility function in the desired location.</p> <p>Lectures: The scale of design. Elements of architectural design. External and internal conditions. The location and orientation of the architectural object. The functional - spatial schemes in architectural objects design. Spatial structures. Stairs and ramps - basic. Design of sanitary facilities - basic. Finishing materials - the color and texture. Architectural details. Elements of interior design. Dimensioning of architectural design. Safety considerations</p>		
Assessment methods	<p>Lectures - workshop - design studio</p> <p>Project work / continuous assessment / examines</p> <p>Intermediate presentations and final evaluation of individual works.</p>		
Recommended readings	<p>1. Alexander C., A Timeless Way of Building,, Oxford University Press, New York, 1979</p> <p>2. Barełkowski R., The Good Architecture Criteria. The Principles of Critical Evaluation for Design Decision Making, Ośrodek Wydawnictw Naukowych, Poznań, 2004</p> <p>3. Barełkowski R., Interdisciplinary Approach to Architecture, Ośrodek Wydawnictw Naukowych, Poznań, Poznań, 2004</p>		
Knowledge	<p>Ability to formulate the functional and spatial program.</p> <p>Understanding the basic principles of creating architectural form.</p> <p>Achieving harmonious outcomes from the premises of location and existing architectural objects.</p> <p>Presentation of programming that complements existing urban organisms or settlement.</p>		
Skills	<p>Ability to formulate the functional and spatial program.</p> <p>Understanding the basic principles of creating architectural form.</p> <p>Achieving harmonious outcomes from the premises of location and existing architectural objects.</p> <p>Presentation of programming that complements existing urban organisms or settlement.</p>		
Other social competences	<p>Ability to formulate the functional and spatial program.</p> <p>Understanding the basic principles of creating architectural form.</p> <p>Achieving harmonious outcomes from the premises of location and existing architectural objects.</p> <p>Presentation of programming that complements existing urban organisms or settlement.</p>		

Course title	Introduction to architectural design II		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Leszek Świątek	E-mail address to the person	lswiatek@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-015-S	ECTS points	4
Semester	summer	Language of instruction	english
Hours per week	4	Hours per semester	60
Objectives of the course	The aim of the course is to develop basic skills in forming the composition of the solid buildings, creating simple functional - spatial systems and learning basic principles of architectural design.		
Entry requirements	new ideas findings ability, creativity building skills, hand drawings, mind maps making		
Course contents	<p>Exercise: Designing public space management arranged by cubature architectural objects and buildings with simple utility function in the desired location.</p> <p>Lectures: The scale of design. Elements of architectural design. External and internal conditions. The location and orientation of the architectural object. The functional - spatial schemes in architectural objects design. Spatial structures. Stairs and ramps - basic. Design of sanitary facilities - basic. Finishing materials - the color and texture. Architectural details. Elements of interior design. Dimensioning of architectural design. Safety considerations</p>		
Assessment methods	<p>Models building, architectural drawings and sketches</p> <p>Project work / continuous assessment / examines</p> <p>Intermediate presentations and final evaluation of individual works.</p>		
Recommended readings	<ol style="list-style-type: none"> 1. McDonough W., Braungart M., The Upcycle. Beyond Sustainability – Designing for Abundance,, North Point Press., New York,, 2013 2. Stang A., Hawthorne C., The Green House. New Directions in Sustainable Architecture,, Princeton Architectural Press, New York,, 2006 3. Borer P., Harris C., The Whole House Book. Ecological building design & materials,, The Centre for Alternative Technology, Machynlleth,, 1998 		
Knowledge	Basic knowledge about architectural form composition and its analyses, functional and spatial programming and integration.		
Skills	<p>Ability to formulate the functional and spatial program.</p> <p>Understanding the basic principles of creating architectural form.</p> <p>Achieving harmonious outcomes from the premises of location and existing architectural objects.</p> <p>Presentation of programming that complements existing urban organisms or settlement.</p>		
Other social competences	Ability to understand functional and spatial programming and consequences of integrative design process.		

Course title	Introduction to BIM		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Wojciech Pawłowski	E-mail address to the person	Wojciech.Pawlowski@zut.edu.pl
Course code (if applicable)	AIU-I-023W	ECTS points	4
Semester	winter	Language of instruction	english
Hours per week	3	Hours per semester	45
Objectives of the course	<p>Basic knowledge of BIM processes</p> <p>Basic knowledge about the possibilities of using software supporting BIM processes</p> <p>Ability to use CAD programs in BIM technology</p> <p>BIM modeling rules</p>		
Entry requirements	<p>Knowledge of issues in the field of general construction</p> <p>General knowledge of the applicable technical conditions that should be met by buildings and their location</p>		
Course contents	<p>Basic rules for creating a BIM model in Archicad</p> <p>Interaction with CAD programs through the IFC format</p> <p>Viewing models in the Solibri and Bim Vision systems</p> <p>Collision detection</p> <p>Creating a basic BIM model</p> <p>General characteristics of the concept of BIM</p> <p>Basic assumptions and requirements set for digital project documentation as a transition to BIM</p> <p>Basic assumptions of the BIM model including data exchange between industry. Data exchange formats and how they are converted. The way of using Archicad software in BIM modeling</p> <p>The basic assumptions of BIM including the phaseness of the investment cycle</p> <p>Legal regulations in the aspect of BIM</p> <p>Software supporting BIM processes - basic functions, methods of service, implementation of BIM information</p> <p>The assumptions of Team Work in the context of BIM modeling</p>		
Assessment methods	<p>Lecture and introductory exercises</p> <p>Problem lecture, conversation lecture, practical exercises</p> <p>Lecture and exercises using specialized CAD and BIM software</p> <p>Mandatory presence</p> <p>Completing a semester task based on the use of BIM technology</p>		
Recommended readings	<p>1. Finnmap Consulting Oy, Gravicon Oy, Olof Granlund Oy, Lemminkäinen Talon Oy, NCC companies, Pöyry CM Oy, Skanska Oyj, COBIM Common BIM Requirements, The Building Information Foundation RTS, Finland, 2012</p> <p>2. Karen M. Kensek, Douglas E. Noble, Building Information Modeling - BIM in current and future Practice, Wiley, USA, 2014</p> <p>3. Dominik Holzer, The BIM Manager's handbook, Wiley, USA, 2016</p> <p>4. Rafael Sacks, Charles Eastman, Ghang Lee, Paul Teicholz, BIM Handbook - Third Edition, Wiley, USA, 2018</p>		
Knowledge	Understanding principles of the Building Information Modelling in a context of construction project management and information management in construction project lifecycle		
Skills	Student is able to choose the right software for BIM tasks. Is able to determine the basic requirements for data exchange and cooperation in a group.		
Other social competences	The student is deeply aware of the importance of group work. Is able to propose and implement BIM methodology, BIM team technologies and other teamwork solutions in a team		

Course title	Mapping and Rendering I		
Level of course	first cycle		
Teaching method	laboratory course		
Person responsible for the course	Kamila Nowak	E-mail address to the person	knowak@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-016-W	ECTS points	4
Semester	winter	Language of instruction	english
Hours per week	3	Hours per semester	45
Objectives of the course	<p>Familiarize students with mapping and rendering basics in 3dsMax.</p> <p>Develop the ability to choose the right means to achieve the intended model visualization and rendering.</p> <p>Focus on visualization for future product technology.</p>		
Entry requirements	<p>Knowledge of solid 3D modeling in CAD.</p> <p>Ability to use presentation and publishing graphics.</p>		
Course contents	<p>Basic modeling in 3dsMax.</p> <p>Basic settings and camera support.</p> <p>Standard and photometric lighting settings and relationships.</p> <p>Selection of shadow type and atmospheric setting.</p> <p>Create material using bitmaps.</p> <p>Modeling with a modifier, among others. Turbosmooth, cloth and object modification with freeform tool.</p> <p>Preparing the object for import using modifiers to clean the model grid.</p> <p>Mastering simple animations.</p> <p>Modeling of rooms by means of walls, windows, doors and objects of architectural usability.</p> <p>Import ready-made 3ds models and edit them.</p> <p>Daylight settings, backgrounds, interior lights, cameras, materials.</p> <p>Master the rendering using the internal Mental Ray rendering engine.</p> <p>Settings and explanation of Final Garther.</p> <p>Improving the skills acquired in the previous semester by performing visualization for the presentation of a diploma project.</p>		
Assessment methods	<p>Information lecture combined with explanation and demonstration.</p> <p>Subject classes - consolidating acquired skills in the form of a practical task.</p> <p>Execute a project for presentation - check general knowledge based on the provided model and rendering.</p> <p>Assessment of student's periodic achievements - exercises and tasks fixing acquired skills during exercises.</p> <p>A test of the acquired skills during the semester.</p> <p>Verification of general knowledge based on the provided model and rendering.</p>		
Recommended readings	<p>1. Wiley, Autodesk 3ds Max 2014 Bible The comprehensive tutorial resource, 2011</p> <p>2. Randi L. Derakhshani, Dariush Derakhshani, Autodesk 3ds Max 2015 Essential, Sybex, 2011</p>		
Knowledge	Has knowledge of the methodology of creating visualizations in 3DS Max. Knows and understands issues in the field of design in relation to the materials used - knows how to make an adequate visualization of the project.		
Skills	Student can make an interesting visualization of the preform with the highest artistic and aesthetic values in the rendering of the object in 3dsMax. Can accurately use known means of expression. Is able to independently carry out a rational visualization of his own project and to achieve optimal rendering.		
Other social competences	Independently expands knowledge and skills in using known graphic programs. Is able to critically refer to his achievements and undertakes actions to verify the original effects of visualization or rendering.		

Course title	Mapping and Rendering II		
Level of course	first cycle		
Teaching method	laboratory course		
Person responsible for the course	Kamila Nowak	E-mail address to the person	knowak@zut.edu.pl
Course code (if applicable)	WBiA-AiU-017-S	ECTS points	4
Semester	summer	Language of instruction	english
Hours per week	3	Hours per semester	45
Objectives of the course	<p>Familiarize students with mapping and rendering basics in 3dsMax.</p> <p>Develop the ability to choose the right means to achieve the intended model visualization and rendering.</p> <p>Focus on visualization for future product technology.</p>		
Entry requirements	<p>Knowledge of solid 3D modeling in CAD.</p> <p>Ability to use presentation and publishing graphics.</p>		
Course contents	<p>Basic modeling in 3dsMax.</p> <p>Basic settings and camera support.</p> <p>Standard and photometric lighting settings and relationships.</p> <p>Selection of shadow type and atmospheric setting.</p> <p>Create material using bitmaps.</p> <p>Modeling with a modifier, among others. Turbosmooth, cloth and object modification with freeform tool.</p> <p>Preparing the object for import using modifiers to clean the model grid.</p> <p>Mastering simple animations.</p> <p>Modeling of rooms by means of walls, windows, doors and objects of architectural usability.</p> <p>Import ready-made 3ds models and edit them.</p> <p>Daylight settings, backgrounds, interior lights, cameras, materials.</p> <p>Master the rendering using the internal Mental Ray rendering engine.</p> <p>Settings and explanation of Final Garther.</p> <p>Improving the skills acquired in the previous semester by performing visualization for the presentation of a diploma project.</p>		
Assessment methods	<p>Information lecture combined with explanation and demonstration.</p> <p>Subject classes - consolidating acquired skills in the form of a practical task.</p> <p>Execute a project for presentation - check general knowledge based on the provided model and rendering.</p> <p>Assessment of student's periodic achievements - exercises and tasks fixing acquired skills during exercises.</p> <p>A test of the acquired skills during the semester.</p> <p>Verification of general knowledge based on the provided model and rendering.</p>		
Recommended readings	<p>1. Wiley, Autodesk 3ds Max 2014 Bible The comprehensive tutorial resource, 2011</p> <p>2. Randi L. Derakhshani, Dariush Derakhshani, Autodesk 3ds Max 2015 Essential, Sybex, 2011</p>		
Knowledge	Has knowledge of the methodology of creating visualizations in 3DS Max. Knows and understands issues in the field of design in relation to the materials used - knows how to make an adequate visualization of the project.		
Skills	Student can make an interesting visualization of the preform with the highest artistic and aesthetic values in the rendering of the object in 3dsMax. Can accurately use known means of expression. Is able to independently carry out a rational visualization of his own project and to achieve optimal rendering.		
Other social competences	Independently expands knowledge and skills in using known graphic programs. Is able to critically refer to his achievements and undertakes actions to verify the original effects of visualization or rendering.		

Course title	PARAMETRIC ARCHITECTURAL DESIGN		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Krystyna Januszkiewicz	E-mail address to the person	Krystyna.Januszkiewicz@zut.edu.pl
Course code (if applicable)	WBIA-AiU-1-018-W	ECTS points	4
Semester	summer	Language of instruction	polish
Hours per week	3	Hours per semester	45
Objectives of the course	The aim of the course is to increase knowledge and skill in design with using parametric digital tools in architectural design. The course is focused on parametric modeling 3D techniques, and will bring participants closer to environments such as Rhino Grasshopper and BIM technology. Additionally developing skills in implementation BIM technology during design process. Course can integrate architecture and structural engineering students. Finally students will have opportunity to practice public presentation.		
Entry requirements	Intermediate skills in architectural design with using CAD digital tools. Basic knowledge of geometrical aspects of architectural forms, BIM, law regulations. Operative in architecture design programs - not necessary course programs.		
Course contents	<p>Project covers functional, formal and structural studies of multifunctional sport facility including various sport activities (hokey rings, multi-purposes halls, hotels, aquatic centres, tourist complexes, etc). During course reference to urban, cultural and regional context will be emphasise. Structural analysing techniques will be introduced.</p> <p>Design process also focused on usage of digital tools, particularly Rhinoceros with Grasshopper. Course will cover whole process from form finding to fabrication preparation and 3d print of developed models.</p> <p>Using parameters to define geometry marks a fundamental shift in aesthetic value: from the exact 'repetition' of elements in traditional design to a varied but 'similar' use of elements in parametric design. Based on the variables, options will be explored (as many as mathematically possible), by automating the process of exploration, similar in principle to the rapid doodles developed during initial conceptual stage. This course uses Rhino & Grasshopper as an aid in design exploration by looking at Facade Design as a complex inter-relationship of intrinsic and extrinsic parameters. Project covers of parametric design oriented to sustainable projects. The Course covers whole process from form finding to fabrication preparation and 3d print of developed models.</p>		
Assessment methods	Lecture and workshop (design studio) Assessment will be made on 3 oral presentations prepared on different stages of project. Final presentation on A0 boards. Presentation will include all the aspects of thesis defence including questions and project discussions with other students. Elements of evaluation based on thesis requirements.		
Recommended readings	<ol style="list-style-type: none"> 1. Januszkiewicz K., O projektowaniu architektury w dobie narzędzi cyfrowych. Stan aktualny i perspektywy rozwoju, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław, 2010 2. Januszkiewicz K., Parametric design and parametric digital tools in architectural design, Architecture at Artibus, Białystok, 2016, 12, pp. 43-60 3. Januszkiewicz K., Kowalski K., Parametric Architecture in the Urban Space, IOP Conference Series: Materials Science and Engineering, Prague, 2017, 245, pp. 1-10. 4. K. Kowalski, K. Januszkiewicz, A parametric green architecture in urban space, a new approach to design environmental-friendly buildings, International Multidisciplinary Scientific Geoconference SGEM, Vienna, 2017, pp. 735-742. 5. Mauro Ch., Geometry and Architecture: NURBS, Design and Construction, Journal of Mathematics & Design, 2004, Vol. 4, No.1, pp. 135-139 6. Januszkiewicz K., Banachowicz M., Nonlinear Shaping Architecture. Designed with using Evolutionary Structural Optimization Tools, IOP Conference Series: Materials Science and Engineering, Prague, 2017 7. Baliński G., Januszkiewicz K., Digital Tectonic Design as a new Approach to Architectural Design Methodology, Procedia Engineering, 2016, 161, pp. 1504-1508. 8. Karen M. Kensek, Douglas E. Noble, Building Information Modeling: BIM in Current and Future Practice, John Wiley & Sons, Hoboken, 2014 9. Kolarevic B., Architecture in Digital Age. Design and Manufacturing, Taylor & Francis, New York and London, 2005 10. Bollinger K., Grohman M., Tessmann O., Form, Force, Performance. Multi-parametric Structural Design, Architectural Design, London, 2008, Vol. 78, No. 2-3, pp. 20-25 11. Burns K., Surface: Architecture's Expanded Field, Architectural Design, London, 2003, Vol. 73, No 2, pp. 86-92. 12. Burry M., Between Surface and Substance, Architectural Design, London, 2003, Vol. 73, No 2, pp. 8-19. 		
Knowledge	Basic understanding of parametric design process. Understanding of main principles in sport facilities design. Basic 3d modeling skills in Rhino and Grasshopper. Extended oral and verbal presentation skills.		
Skills	Basic understanding of parametric design process. Basic 3d modeling skills in Rhino and Grasshopper. Extended oral and verbal presentation skills.		
Other social competences	Basic understanding of parametric design process. Understanding of main principles in sport facilities design. Basic 3d modeling skills in Rhino and Grasshopper. Extended oral and verbal presentation skills.		

Course title	Rural design		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Olga Gazińska	E-mail address to the person	olga.gazinska@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-019-W	ECTS points	4
Semester	winter	Language of instruction	english
Hours per week	4	Hours per semester	60
Objectives of the course	The scope of the subject is to develop a concept for a spatial development plan for a functionally and landscape-degraded area of a rural village, which is related to the influence of a big city, based on historical planning and analysis. Lectures include theoretical basis and methods used in local plans and projects.		
Entry requirements	Participation in the workshop - Urban designing CS1-XIV/4 (4 semester);		
Course contents	<p>The scope of the workshop is to elaborate concept of spatial arrangements plan of functional and landscape degraded rural village area being in relation of influence of great city, based on planning and historical analysis.</p> <p>During the semester students are working in groups of 4 persons and obtain professional advice.</p> <p>The purpose of the course is to teach students in the range of: investigation processes concerning suburban zone, investigation of problems concerning selected rural settlements in the aspect of conditions of spatial-functional system .</p> <p>The content of the lectures is related to the specificity of rural settlement systems, with particular emphasis on the processes taking place in the suburban area in the exogenous interactions with regard to individual types of settlement network units .</p> <p>Thematic blocks of lectures: Classification of rural settlements. Typologies of rural settlement Characteristics of rural areas of the West Pomeranian Voivodeship. Transformations of the rural settlement structure. Basic services for the economy and rural population. Suburbanization in the aspect of rural development. Shaping high-quality spatial development of suburban villages. Quality of spatial management of rural areas Local identity in the aspect of cultural landscape. Coordination of spatial development in areas adjacent to major cities - national and European experience. Development of rural settlements in the cross-border area of the Szczecin Metropolitan Region.</p>		
Assessment methods	<p>Teaching methods: Informative and problem lectures taking into account the specificities of rural settlement in the influence zone of large cities. The design method applied exercises preceded by a local vision of selected rural settlements units.</p> <p>Assessment: Assessment takes place through the public presentation of the work including the concept of spatial transformation village and also detailed concept of a chosen part of the area under operation.</p>		
Recommended readings	<ol style="list-style-type: none"> 1. Bollman R. and Bryden J, Rural Employment: An international perspective;, Walingford CAB International, London, 1997 2. Susanne Kratochwil, European images around sprawl(ing);, Vienna University of Technology, Vienna, 2005 3. McElfish Jr James M, Ten things wrong with sprawl, The Environmental Magazine 03/04, 2007, 03/04 4. Michael Chishholm, Rural settlements and land use, Adline Transaction, New Brunswick, 2007 		
Knowledge	Knows design and planning methodology, including computer and IT methods.		
Skills	Understanding the origins of rural settlement structure in terms of development and functional transformation of the settlement units. The ability to identify and solve problems selected units of the settlement network in terms of conditions of endogenous functional aspect of the planning, development of spatial order, the degree of spatial integration, composition, occurring areas of recession, transportation system, natural, historical and cultural resources, and physiognomic features of the landscape and local identity.		
Other social competences	Is open and communicative, expresses his/her views, presents solutions and discusses them with other professionals, with the public and with media.		

Course title	Special architectural design		
Level of course	first cycle		
Teaching method	project course		
Person responsible for the course	Leszek Świątek	E-mail address to the person	lswiatek@zut.edu.pl
Course code (if applicable)	WBiA-AiU-1-020-W	ECTS points	4
Semester	winter	Language of instruction	english
Hours per week	3	Hours per semester	45
Objectives of the course	<p>The aim of workshop is to pass following stages of design:</p> <ol style="list-style-type: none"> 1. Designing a functional program of the building. 2. Variant studies on the architecture of the building 3. Designing the location of a building or an urban complex on a building plot. 4. Designing the road system associated with the building. 5. Designing of individual functional units of the building. 6. Structural and installation analysis. 7. Design and technical development of the facade of the building. 		
Entry requirements	<p>Competence in architectural design in a large scale and medium complex function.</p> <p>Required knowledge: building construction, building installation (ventilation, plumbing, wiring), architectural drawing and modelling, building legislation.</p> <p>Former courses credits are required.</p>		
Course contents	<p>Designing a building or an urban complex consisting of several buildings with medium functional complexity. Solving design problems resulting from the coexistence of various functions in a building. Solving design problems related to transport service of the designed building.</p>		
Assessment methods	<ol style="list-style-type: none"> 1. Tutoring 2. Design workshop 3. Studying functional elements 4. Studying inspiration examples 5. Seminar <p>Completing of term project (A3 format, min.4 large-scale illustrations and digital version on CD, saved in PDF extension)</p> <p>Project book, containing drafts regarding project, inspirations and resources, presenting development of the work during the project exercises and thesis draft description.</p>		
Recommended readings	<ol style="list-style-type: none"> 1. Alexander Ch., A patern language - towns, buildings, construction, Oxford University Press, 1997 2. Hardy H., Performin art s Facillies, John Vile4y Hoboken, 2006 3. Hoke J.R., Architectural Graphic Standards, John Wiley, New Jersey, 2000 4. Lawson F., Lawson, F.: 2007, Congress, Convention and Exhibition Facilities. Planning, Design and Management,, Architectural Press,, Oxford, 2007 5. Schwanke D.C., Mixed-Use Development Handbook,, ULI, Washington, 2003 		
Knowledge	<p>Depth knowledge of the premises resulting from the specific function of the object and its background, technology, etc.</p>		
Skills	<p>Ability to formulate the functional and spatial program.</p> <p>Understanding the basic principles of creating architectural form.</p> <p>Achieving a harmonious outcome arising from the relationship between form and function.</p> <p>Depth knowledge of the premises resulting from the specific function of the object and its background, technology, etc.</p>		
Other social competences	<p>Understanding the basic principles of creating architectural form.</p> <p>Achieving a harmonious outcome arising from the relationship between form and function.</p>		

Course title	Techniques and technologies in the architecture and construction		
Level of course	first cycle		
Teaching method	laboratory course		
Person responsible for the course	Piotr Gradziński	E-mail address to the person	pgradzinski
Course code (if applicable)	WA-2021-TiTWa	ECTS points	2
Semester	winter/summer	Language of instruction	polish
Hours per week	2	Hours per semester	30
Objectives of the course	Gaining knowledge about basic design mechanisms and processes, mastering a skill of variant modeling of processes and simulation in the created architectural space.		
Entry requirements	Passing up the preceding subjects (or determining the required knowledge): required classes in the semester I, II and III.		
Course contents	<ol style="list-style-type: none"> 1. Overview of the scope of exercises. 2. General characteristics of the preparation of technical documentation, cadastral map and essential, land and building register, outline of geotechnical issues. 3. Foundation of the building - characteristics and types of foundations. 4. Types of insulation - anti-moisture, anti-water - footings or foundation slabs. 5. Building materials, their properties and application. 6. I - Types of internal and external walls (including one-two-three-layer walls, plasterboard walls) 7. II - Types of internal and external walls (wall with a light cover layer - panels composite, fiber cement, wooden or plastic panels etc.). 8. III - Types of external and external walls (wall with a heavy covering layer - slabs ceramic, stone, etc.). 9. Ventilation, chimneys and plumbing risers. 10. Types and kinds of roofs, roof truss, utility flat roof, green roofs. 11. Details - tiled roof (finished with plasterboards from the inside), attic (finishing for a two-layer and three-layer wall), the eaves at the external wall (various types finishes). 12. Balconies, terraces. 13. Checking the drawings. 14. Function - Form - Construction. 15. Submission of drawings and models / completion of the course. 		
Assessment methods	<p>Technical and technological issues based on selected examples of detailed architectural and construction solutions. Features of internal and external building partitions. Detailed drawings. Exercise 1. Waterproofing of the foundation slab (classic mastic and roofing felt and alternative solutions). Exercise 2. Anti-water insulation of the elevator shaft - trim of the foundation slab (classic mastic and roofing felt and alternative solutions). Exercise 3. Counter-insulation of a reinforced concrete pile cap. Foundation on slabs. Exercise 4. Detail of a two-layer wall solution at the foundation. Vertical and horizontal waterproofing (classic and alternative solutions). Exercise 5. Detail of a three-layer wall solution (with a pressure wall) at the foundation. Vertical and horizontal waterproofing (classic and alternative solutions). Exercise 6. Detail of the parapet solution for a two- and three-layer wall. Exercise 7. Detail of a wall solution with a light cover layer. Exercise 8. Detail of a wall solution with a heavy covering layer. Exercise 9. Detail of the eaves of a roof covered with ceramic tiles. Exercise 10. Detail of a roof ridge solution covered with ceramic tiles. Exercise 11. Detail of a flat roof solution with a biologically active layer. Exercise 12. Principles of shaping a non-ventilated and ventilated roof. Exercise 13. Principles of shaping the balcony slab (continuous and discontinuous). Exercise 14. Examples of facade glazing systems and detailed solutions. Exercise 15. Principles of shaping the corner window.</p> <p>Classes are based on study and project work during classes, at the beginning of which a project task is formulated, which should be solved by the method of subsequent approximations. At the beginning of the semester students are given the algorithm of design for all exercises. Individual corrections, homeworks, closures and progress reviews of project work are carried out.</p> <p>Precise definition of the topic of each exercise, which brings the student closer to the solution of the project topic.</p> <p>As a result of the course, the student should be able to determine the types of technical, technological and material solutions present in construction. In particular, he should be able to determine their durability and usefulness. The basis for passing the course is to present an A4 notebook with drawing solutions and a description.</p> <p>During the laboratory exercises, students develop technical drawings of architectural and construction details, as indicated by the lecturer. During the course, the lecturer presents problems related to the use of building materials, techniques and technologies, and how to solve them. Alternative solutions to the construction problem are also given, with an indication of the durability aspect of building partitions and materials, and with reference to heat and humidity issues. Active participation in classes involving the attempt to solve the problem on your own.</p> <p>As a result of the course, the student should be able to determine the types of technical, technological and material solutions present in construction. In particular, he should be able to determine their durability and usefulness. The basis for passing the course is to present an A4 notebook with drawing solutions and a description.</p>		
Recommended readings	<ol style="list-style-type: none"> 1. DETAIL, Detail, Munich, DETAIL - Magazine of Architecture + Construction Details 2. Design Theory and Methods using CAD/CAE, Elsevier, 2014 		

Knowledge	Students knows and understands the theoretical foundations of Techniques and technologies in the architecture and construction.
Skills	Design and detailing of basics in the techniques and technologies in the architecture and construction.
Other social competences	The student understands the need for lifelong learning.

Course title	Urban design		
Level of course	first cycle		
Teaching method	project course / lecture		
Person responsible for the course	Klara Czyńska	E-mail address to the person	Klara.Czynska@zut.edu.pl
Course code (if applicable)	WBiA-UiA-1-O21-W	ECTS points	4
Semester	winter	Language of instruction	english
Hours per week	4	Hours per semester	60
Objectives of the course	<p>to learn evaluating of urban areas and rational urban structures shaping in respect to cultural heritage, nature, townscape values and modern requirements</p> <p>to learn multifunctional urban ensembles designing including various conditions</p> <p>to be familiar with actual doctrine and trends of modern urban design</p> <p>to be aware of different consequences of planning decisions and construction investments</p> <p>to be able to demonstrate the final result in attractive graphic form and multimedia presentation</p>		
Entry requirements	<p>Spatial and townscape conditionality of the area abilities analysis</p> <p>urban design objects of former semesters grading</p>		
Course contents	<p>GENERAL TOPIC: Transformation, renovation and redevelopment of "brown fields" urban areas</p> <p>THE TASK: The elaboration of the concept of the redeveloping selected area of the city, based on historical and spatial analysis (optional following legal site plan if existed)</p> <p>Local vision</p> <p>Historic analysis</p> <p>Planning analyses - external considerations</p> <p>Planning analyses - internal considerations:</p> <ul style="list-style-type: none"> - Urban inventory - Townscape study - Analysis of legal site plan concerning decisions for case study area (optional if existed) <p>Concept of the area redeveloping:</p> <p>A. Graphic part of the concept wich should include:</p> <ul style="list-style-type: none"> - differentiation of existing and new buildings and designation of function for all buidings - area developing showing green composition, small architecture, pavement materials - transportation accessibility solution - schemes which explain idea for program, transportation, green, etc. - visual presentation of the new imagery of the area <p>B. Written part, wich should include:</p> <ul style="list-style-type: none"> - short characteristic of the existing situation - syntetic conclusions from analysis - description of the design principles - description of the solutions in reference to programe, form of achitecture, composition, green, transportation, other elements <p>URBAN TRANSFORMATIONS</p> <p>PUBLIC SPACE</p> <p>PLACE IDENTITY</p> <p>MOBILITY & SAFETY - SUSTAINABLE MOBILITY</p> <p>ATTRACTIVENESS: GREENSPACE, WATER, ART, URBAN FUTNITURE ACTIVENESS</p>		
Assessment methods	<p>lecture</p> <p>tutors hours</p> <p>consulting</p> <p>seminar</p> <p>workshop</p> <p>grade</p> <p>essays</p> <p>project work</p> <p>continuous assessment</p>		
Recommended readings	<ol style="list-style-type: none"> 1. Christopher Alexander, A pattern Language, Towns, Buildings, Construction, http://pl.scribd.com/doc/40651518/Christopher-Alexander-A-Pattern-Language-Book 2. Kevin Lynch, The Image of the City, The MIT Press, 1960, www.amazon.com/dp/0262620014/ref=rdr_ext_sb_ti_hist_1#reader_0262620014 3. Gordon Cullen, The Concise Townscape, Taylor & Francis Group, 2012 4. Jan Gehl, Life between buildings. Using public space, Danish Architectural Press (Arkitektens Forlag), 1971 		

5. Jan Gehl, Cities for People, ISLAND Press, 2010
 6. Jeff Speck, Walkable City, How Downtown Can Save America, One Step at a Time, www.amazon.com/Walkable-City-Downtown-Save-
 7. Jane Jacobs, The Death and Life of Great American Cities, www.amazon.com/American-Cities-Anniversary-Edition-Library/dp/0679644334/ref=pd_sim_b_8#reader_0679644334

Knowledge	<p>The student knows the basics of urban construction and functioning and is able to characterize selected contemporary examples of revitalization of urban structures.</p> <p>The student knows the selected methods of creating virtual city models and their application for urban analysis and spatial planning.</p>
Skills	<p>Student is able to prepare the concept of functional and spatial revitalization of a city or part of a city, taking into account existing conditions.</p> <p>Student is able to develop a simplified virtual city model or part of the city and use it to visualize urban analyzes and project presentations.</p>
Other social competences	<p>The student is ready for teamwork on preparation of urban planning studies, knows how to express their own views and discuss in the industry.</p>