Attachment no. 5 to ZW 16/2020

Attachment no. **15** to studies program

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| **FACULTY OF ARCHITECTURE**  **COURSE SYLLABUS**  Course title in Polish: **Projektowanie architektoniczne - architektura eksperymentalna**  Course title in English: **Architectural design - experimental architecture**  Specialization (if applicable): **Architecture**  Profile (if applicable): **Architecture and Urban Design**  Level and form of studies: **2nd level, full-time**  Semester: **2**  Course type: **optional**  Course code**: AUA117707P**  Group of courses: **NO** |

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|  | **Lecture** | **Tutorial** | **Laboratory** | **Project** | **Seminar** |
| Number of hours of organized classes in University (ZZU) |  |  |  | **105** |  |
| Number of hours of total student workload (CNPS) |  |  |  | **225** |  |
| Form of crediting |  |  |  | **Crediting with grade** |  |
| For group of courses mark (X) final course |  |  |  |  |  |
| Number of ECTS points |  |  |  | **9** |  |
| including number of ECTS points for practical (P) classes |  |  |  | **5** |  |
| including number of ECTS points for direct teacher-student contact classes or other people conducting classes (BU) |  |  |  | **6,75** |  |

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| **PREREQUISITES RELATED TO KNOWLEDGE, COMPETENCES AND SOCIAL SKILLS** |
| **No prerequisites.** |

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| **COURSE OBJECTIVES** |
| **C1** to develop the ability to synthesize the complex and multi-layers research problems connected with extreme challenges for architecture, resulting from: development of new technologies (interactive, generative, biomimetic architecture etc.) and rapid changes of the spatial settings of human life (climatic catastrophes, pollution of the environment, people’s migrations, social conflicts etc.).  **C2** to introduce the contemporary innovative technologies in architecture and building structures to the students (high-tech vs. low-tech).  **C3** to point out the future trends in housing architecture development.  **C4** to realize the architectural experiment based on the chosen research and design tools (parametric design, probability, prototypes, interview, questionnaire etc.).  **C5** to acquaint the students with the criteria of programming, designing and verifying the correctness of functional and spatial solutions of housing architecture; energy efficiency and economics of the architectural solutions.  **C6** to teach the responsibility for effectiveness of research project; to develop the ability of working in a team. |

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| **COURSE LEARNING OUTCOMES** |
| **Relating to knowledge:**  1.1.1) The graduate knows and understands structural, constructional and engineering problems associated with designing buildings.  1.1.2) The graduate knows and understands detailed issues in the field of architecture and urban planning related to solving complex design problem.  1.1.3) The graduate knows and understands advanced issues related to architecture and urban planning useful for designing structures in the context of social, natural, economic, legal and other non-technical conditions of engineering activities.  1.1.4) The graduate knows and understands issues related to the physics, technology and functions of buildings to the extent that ensures the comfort of their utilization and protection against atmospheric agents.  1.1.5) The graduate knows and understands relations between man and architecture and between architecture and the surrounding environment, and the necessity to adapt architecture to human needs and scale.  1.1.6) The graduate knows and understands regulations and procedures that are necessary to implement building projects and integrate buildings with the overall urban planning project.  1.1.7) The graduate knows and understands methods and measures for the implementation of ecologically responsible and sustainable design and the protection and conservation of the surrounding environment.  1.1.9) The graduate knows and understands principles, solutions, structures and building materials used in complex engineering tasks related to architectural design.  1.1.10) The graduate knows and understands issues related to architecture and urban planning in the context of the interdisciplinary nature of architectural and urban design as well as the need to cooperate with other specialists.  1.1.11) The graduate knows and understands principles of collecting information and interpreting it when developing a design concept.  1.1.12) The graduate knows and understands principles of professional presentation of architectural concepts.  1.1.13) The graduate knows and understands the nature of the architectural profession and its role in society.  A.W1. The graduate knows and understands architectural design in a complex context, public use buildings in an urban environment.  A.W4. The graduate knows and understands provisions of local land-use plans to the extent that is necessary for architectural design.  A.W5. The graduate knows and understands the principles of universal design, including the concept of designing spaces and buildings accessible to all users, and the principles of ergonomics, necessary to provide full functionality of the space and structures under design.  A.W6. The graduate knows and understands advanced methods of analysis, tools, techniques and materials necessary to develop design concepts in an interdisciplinary environment, with particular emphasis on cross-industry collaboration.  A.W8. The graduate knows and understands the interdisciplinary nature of architectural and urban design and the need to integrate knowledge from other disciplines and to apply it in the designing process in cooperation with specialists in these disciplines.  **Relating to competences:**  1.2.1) The graduate is able to use the experience acquired during studies to critically analyze the conditions and formulate conclusions for designing in a complex, interdisciplinary context.  1.2.2) The graduate is able to use interdisciplinary knowledge and skills acquired during studies to design a sophisticated architectural structure or urban complex that meets the aesthetic and technical requirements, creating and transforming space and giving it new values.  1.2.3) The graduate is able to prepare an advanced graphic, written and oral presentation of his or her original design concepts in the field of architecture.  1.2.4) The graduate is able to apply analytical methods in formulating and solving design tasks, present the theoretical background and the justification for the presented solutions in the form of a scientific study.  1.2.5) The graduate is able to organize the work including all phases of design concept development.  A.U1. The graduate is able to design a complex architectural structure, creating and transforming space so as to give it new values – in accordance with the assigned or adopted program which takes into account the requirements and needs of all users, the spatial context, and the technical and non-technical aspects.  A.U4. The graduate is able to perform a critical analysis of conditions, including the assessment of land use and development, forecast the processes of transformation of cities and predict the effects of these transformations.  A.U5. The graduate is able to evaluate the usefulness of advanced methods and tools for solving simple and complex engineering tasks that are typical in architecture, urban planning and spatial planning, and choose and apply appropriate methods and tools in designing.  A.U7. The graduate is able to perform a critical analysis and assessment of a project and its implementation with respect to the modernization and reconstruction of architectural and urban structures that have cultural values.  A.U8. The graduate is able to think and act creatively, with an understanding that designing is a complex and multi-faceted endeavor, and express his or her own artistic concepts in architectural and urban design.  A.U9. The graduate is able to integrate information obtained from various sources, interpret and critically analyze it in detail and use it to draw conclusions, as well as formulate and justify opinions and demonstrate their relationship with the designing process on the basis of available scientific achievements in the discipline.  A.U10. The graduate is able to communicate by means of various techniques and tools in a professional and interdisciplinary environment to the extent that is appropriate for architectural and urban design.  A.U11. The graduate is able to work individually and in a team, including collaborating with specialists from other industries.  A.U12. The graduate is able to estimate the time needed to complete a complex design task.  A.U13. The graduate is able to formulate new ideas and hypotheses, analyze and test novelties related to engineering and research problems in the field of architectural and urban design.  A.U14. The graduate is able to prepare architectural and construction documentation using appropriate scales and in relation to the conceptual architectural design.  A.U15. The graduate is able to implement the principles and guidelines of universal design in architecture.  **Relating to social skills:**  1.3.2) The graduate is ready to respect the diversity of views and cultures and demonstrate sensitivity to the social aspects of the profession.  1.3.3) The graduate is ready to take responsibility for social, architectural and urban planning values in the protection of the environment.  A.S1. The graduate is ready to effectively use imagination, intuition, creative attitude and independent thinking to solve complicated design problems.  A.S2. The graduate is ready to speak and make presentations in public.  A.S3. The graduate is ready to follow teamwork principles and take responsibility for joint tasks and projects.  A.S4. The graduate is ready to take responsibility for shaping the natural environment. |

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| **PROGRAMME CONTENT** | | |
| **Form of classes - project** | | **Number of hours** |
| Proj 1 | Analysis of the problems and threats connected with civilization development in XXI century based on studies of literature and formulation of the challenges and trends of the architecture and structural engineering development in the nearest future.  Knowledge:  Experimental architecture: problems and challenges of the XXI century – biosphere vs. technosphere – architecture in extreme conditions.  Introduction to the course, form of project’s completion, credits. | 8 |
| Proj 2 | Choice of design problem.  Knowledge:  Research methods in architecture – design methodology.  Evaluation criteria – biosphere vs. technosphere. Analysis of the natural and civilization-technological systems complexity. Defining of the extreme parameters of both systems, looking for the spatial conflicts between bio- and technosphere in architecture. | 8 |
| Proj 3 | Choosing the location of the design task.  Knowledge:  Architecture of the future – review of the utopian visions.  Studies and analyses: socio-cultural, civilization-technological, environmental-landscape etc. | 8 |
| Proj 4 | Brainstorming: generating design ideas.  Study of variant conceptual spatial models of the solutions of chosen design problem, connected with the extreme challenges of XXI century.  **Presentation of the research projects and discussion.** | 8 |
| Proj 5 | Analyses of the conceptual spatial models relating to chosen design problem of experimental architecture according to their ideological, structural, program, technological and semantic complexity.  Simulation of solutions: spatial variants.  Knowledge:  Advanced theoretical models of built-environment: *space syntax*, pattern language (Ch. Alexander), type-morphology (C.G.Argan) etc. | 8 |
| Proj 6 | Analysis of the conceptual spatial models relating to chosen design problem of experimental architecture according to the effectiveness, energy-efficiency and energy-activities of the structures.  Simulation of solutions: spatial variants.  Knowledge:  Sustainable design challenges of the experimental architecture. | 8 |
| Proj 7 | Synthesis: types and models of spatial solutions of the experimental architecture relating to chosen design problem of the extreme challenges of XXI century.  Presentation of the concepts in form of ideograms, diagrams and 3D-models with theoretical description of design problem (conceptual part of research project). | 8 |
| Proj 8 | Choice of the design variant of experimental architecture. Detailed programmatic-functional solutions of chosen design variant.  **Presentation of the research projects and discussion.** | 8 |
| Proj 9 | Material-technological aspects of chosen design variant. Detailed architectural solutions related to shaping of the architectural form. | 8 |
| Proj 10 | Technological solutions of chosen design variant (structure, materials, technologies).  Knowledge:  Innovative technological solutions (3D-printing, pneumatic, recycled, waste structures etc.). | 8 |
| Proj 11 | Prototype’s design: structure, materials, technologies. 3D-spatial modelling.  **Presentation of the research projects and discussion.** | 8 |
| Proj 12 | Verification of the parameters of prototype.  Calculation of the basic technical parameters of the spatial structure of chosen design variant of experimental architecture. | 8 |
| Proj 13 | Studies of architectural-structural details of design spatial structure of chosen design variant of experimental architecture.  Prototype fabrication. | 8 |
| Proj 14 | Studies of the interior arrangement details of an experimental architecture chosen design variant.  Research project’s description (technical part of research project). | 8 |
| Proj 15 | Variants of graphic presentation of project.  **Presentation of the research projects and discussion.**  Exhibition and project credits. | 8 |
|  | **Total hours** | **120** |

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| **TEACHING TOOLS** |
| **N1** – Conceptual work.  **N2** - Design workshop.  **N3** - Problem-solving discussion.  **N4** - Studies of literature.  **N5** - Multimedia presentation.  **N6** – Individual consultations. |

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| **ASSESSMENT OF ACHIEVEMENT OF LEARNING OUTCOMES** | | |
| **Evaluation** (F – forming (during semester), C – concluding (at semester end) | Number of learning outcome | Method of assessing the achievement of learning outcome |
| F1 | 1.1.1)  1.1.2)  1.1.3)  1.1.4)  1.1.5)  1.1.6)  1.1.7)  1.1.9)  1.1.10)  1.1.11)  1.1.12)  1.1.13)  A.W1.  A.W4.  A.W5.  A.W6.  A.W8.  1.2.1)  1.2.2)  1.2.3)  1.2.4)  1.2.5)  A.U1.  A.U4.  A.U5.  A.U7.  A.U8.  A.U9.  A.U10.  A.U11.  A.U12.  A.U13.  A.U14.  A.U15.  1.3.2)  1.3.3)  A.S1.  A.S2  A.S3.  A.S4. | evaluation of the problem-ideological quality of the research project |
| F2 | evaluation of the analytic-methodological quality of the research project |
| F3 | evaluation of the innovativeness of the research project |
| **C = 30%F1 + 30%F2 + 40%F3** | | |

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| **BASIC AND ADDITIONAL LITERATURE** |
| **basic LITERATURE:**   1. *Landform Building: Architecture’s New Terrain,* Allen, S., McQuade, M. (red.), Baden 2011. 2. Bell, M., Kim, J., *Engineered Transparency – The Technical, Visual and Spatial Effects of Glass*, New York 2009. 3. Betsky, A., *Landscraper. Building with the Land*, London 2002. 4. Bollnow, O., *Human Space*, London 2008. 5. *The Metapolis Dictionary of Advanced Architecture. City, Technology and Society in the Information Age*, Cross S. (red.), Barcelona 2003. 6. Farr, D., *Sustainable Urbanism. Urban Design with Nature*, London 2008. 7. *The New Nomads: Temporary Spaces and a Life on the Move*, Galindo, M., Klanten, R., Ehmann, S. (red.), Berlin 2015. 8. Habraken ,N.J., Mignucci, A., Teicher, J., *Conversations with Form*, New York 2014. 9. Hebel, D., Heisel, F., Wisniewska, M.H., *Building from Waste: Recovered Materials in Architecture and Construction*, Basel 2014. 10. Hillier, B., *Space is the Machine: A Configurational Theory of Architecture*, Cambridge 1999.   **additional LITERATURE:**   1. Arnheim, R., *Dynamika formy architektonicznej*, Łódź 2016. 2. Buadrillard J., *Symulakry i symulacja*, Warszawa 2005. 3. Colquhoun I., *Design Out Crime. Creating Safe and Sustainable Communities*,London 2004. 4. Harari Yuval, N., *Homo deus: krótka historia jutra*, Kraków 2018. 5. Jencks Ch., *The Architecture of the Jumping Universe. A Polemic: How Complexity Science is Changing Architecture and Culture*, Chichester 1997. 6. *Translucent Materials. Glass, Plastic, Metals*, Kaltenbach F. (red.), Munich 2004. 7. Moussavi, F., *The Function of Style*, Barcelona 2015. 8. Ruby, I., Ruby, A., *Groundscapes*, Barcelona 2006. 9. Schittich, Ch., Staib, G., Balkow, D., Schuler, M., Sobek, W., *Glass Constraction Manual*, Munich 2007. 10. *Verb Natures*, Soriano D. (red.), Barcelona 2006. 11. Schwarz, M., Krabbendam, D., Sustainist Design Primer: Collaborative Design for Connectivity, Localism, and Sustainable Life, Amsterdam 2013. |

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| **COURSE SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)** |
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