Attachment no. 5 to ZW 16/2020

Attachment no. **19** to studies program

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| **FACULTY OF ARCHITECTURE**  **COURSE SYLLABUS**  Course title in Polish: **Projektowanie architektoniczne - ProtoLAB**  Course title in English: **Architectural design - ProtoLAB**  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: **AUA117749P**  Group of courses: **NO** |

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|  | **Lecture** | **Tutorial** | **Laboratory** | **Project** | **Seminar** |
| Number of hours of organized classes in University (ZZU) |  |  |  | **60** |  |
| Number of hours of total student workload (CNPS) |  |  |  | **125** |  |
| Form of crediting |  |  |  | **Crediting with grade** |  |
| For group of courses mark (X) final course |  |  |  |  |  |
| Number of ECTS points |  |  |  | **5** |  |
| including number of ECTS points for practical (P) classes |  |  |  | **3** |  |
| including number of ECTS points for direct teacher-student contact classes or other people conducting classes (BU) |  |  |  | **3,75** |  |

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

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| **COURSE OBJECTIVES** |
| **C1** providing knowledge in the field of creative design problem solving basing on small architecture objects, industrial forms and innovative designs.  **C2** transfering of knowledge about the methodology of product design in architecture from the concept stage to its implementation.  **C3** presenting information concerning contemporary and innovative architectural and material solutions.  **C4** development of the design skills realized through the full path from initial design to construction.  **C5** development the ability to work in a group, find a position and to realize assigned tasks.  **C6** acquiring the ability to use basic construction tools and power tools.  **C7** acquiring the ability to perceive relationships in teamwork, and to be sensitive and solicitude of the best possible end result of the assigned task. |

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| **COURSE LEARNING OUTCOMES** |
| **Relating to knowledge:**  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 collecting information and interpreting it when developing a design concept.  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.  1.2.3) 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 and urban planning, using a convention that satisfies the requirements of professional architectural and urban design.  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 simple and 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 and cultural context, and the technical and non-technical aspects.  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.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 and spatial planning.  A.U11. The graduate is able to work individually and in a team, including collaborating with specialists from other industries, and take on a leadership role in such teams.  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 and spatial planning.  A.U14. The graduate is able to prepare architectural and construction documentation using appropriate scales and in relation to the conceptual architectural design.  **Relating to social skills:**  1.3.1) The graduate is ready to work in a professional manner, comply with the principles of professional ethics and take responsibility for his or her actions.  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.  1.3.4) The graduate is ready to learn all life long, among others, by enrolling in doctoral and post-graduate programs or participating in other forms of education.  1.3.5) The graduate is ready to inspire others to learn and organize the educational process.  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 take on the role of coordinator of activities in the design processes, manage team work and use interpersonal skills (conflict resolution, negotiation, task delegation), follow teamwork principles and take responsibility for joint tasks and projects. |

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| **PROGRAMME CONTENT** | | | |
| **Form of classes - project** | | | **Number of hours** |
| Proj 1 | | Introduction to the design task. | 4 |
| Proj 2 | | Preparation of project concepts corresponding to the main task - consultation in small teams. | 4 |
| Proj 3 | | Working in teams on selected projects.  Consultations. | 4 |
| Proj 4 | | Preparation of conceptual projects presentations - development of basic technical and engineering issues. | 4 |
| Proj 5 | | Presentation of project concepts prepared by small teams - selection of projects for further development, division into task groups. | 4 |
| Proj 6 | | Preparation of a common project vision, selection of materials and technical solutions - consultation in task groups. | 4 |
| Proj 7 | | Technical solutions, selection of appropriate materials and methods of project implementation, working with mock-ups - preparation of whole or partial solutions for acceptance. | 4 |
| Proj 8 | | Project development, work on details, preparation of technical and executive drawings. | 4 |
| Proj 9 | | Preparation of the building process schedule and budget for the project. | 4 |
| Proj 10 | | Preparation of technical documentation and details descriptions. | 4 |
| Proj 11 | | Prototyping of the project elements - workshops | 4 |
| Proj 12 | | Prototyping of the project elements - workshops | 4 |
| Proj 13 | | Experimental work on elements of prototypes - workshops and research work. | 4 |
| Proj 14 | | Implementation of the project in the form of a prototype using construction tools - workshops | 4 |
| Proj 15 | | Final presentation of the project | 4 |
|  | **Total hours** | | **60** |

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| **TEACHING TOOLS** |
| **N1 -** Conceptual work.  **N2 -** Presentations and group discussions.  **N3 -** Group consultations.  **N4 -** Problematic discussions.  **N5 -** Teamwork.  **N6 -** Design workshops.  **N7 -** Modeling and drawing workshops.  **N8 -** Prototyping.  **N9 -** Project presentations. |

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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 | 1.1.10)  1.1.11)  1.1.12)  A.W6.  A.W8.  1.2.1)  1.2.3)  1.2.4)  1.2.5)  A.U1.  A.U5.  A.U8.  A.U9.  A.U10.  A.U11.  A.U12.  A.U13.  A.U14.  1.3.1)  1.3.2)  1.3.4)  1.3.5)  A.S1.  A.S2.  A.S3. | Evaluation of the substantive and aesthetic content of the conceptual design and creative response to the design problem |
| F2 | Evaluation of involvement in the project process and cooperation with other participants in the task group and evaluation of the final effects of the project implementation |
| F3 | Evaluation of group work and student involvement during design and implementation workshops |
| **C = (F1 + F2 + F3) :3** | | |

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| **BASIC AND ADDITIONAL LITERATURE** |
| **basic LITERATURE:**   1. Eekhout, M., *Methodology of Product Development in Architecture*, Rotterdam 2008. 2. Tarczewski, R. *Konstruowanie architektury. Uwagi o materializacji formy architektonicznej*, Wrocław 2019. 3. Lelieveld, Ch., *Smart materials for the realization of an adaptive building component*, Delft 2013.   https://repository.tudelft.nl/islandora/object/uuid%3A21ba183b-450e-45a1-bc89-24799586735c   1. Knaack, U., Bilow, M., Strauss, H., *Rapids, Imagine 04, Layered Fabrication Technologies for Facades and Building Construction,* Rotterdam 2010.   https://books.bk.tudelft.nl/index.php/press/catalog/download/isbn.9789064506765/584/507-1?inline=1   1. Knaack, U., Bilow, M., *The Story of the Bucky Lab*, Rotterdam 2019.   https://books.bk.tudelft.nl/index.php/press/catalog/book/ISBN\_9789463662383   1. Eekhout, M. van Swieten, P., *The Delft Prototype Laboratory*, Rotterdam 2016.   https://repository.tudelft.nl/islandora/object/uuid:f6656dd9-9696-4f70-bb58-50e546b923c7/datastream/OBJ/download   1. Deplazes, A., *Constructing Architecture,* Basel 2005. 2. Charleson, A., W. *Structure as Architecture. A source book for architects and structural engineers*, Oxford 2005. 3. Cruz, P.J.S., *Structures and Architecture, Bridging the Gap and Crossing Boarders*, London 2019.   **additional LITERATURE:**   1. McQuaid, M., *Shigeru Ban,* London 2008. 2. Latka, J. *Paper in Architecture. Research by design, engineering and prototyping,* Delft 2017.   https://journals.open.tudelft.nl/abe/article/view/1875 |

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