



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Adaptation to climate changes [S2Arch1>AdZK]

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### Course

Field of study

Architecture

Year/Semester

1/2

Area of study (specialization)

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Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

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### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

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### Number of credit points

2,00

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### Coordinators

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### Lecturers

### Prerequisites

student has explicit, theoretically based knowledge including the key issues of architecture and urban planning as well as landscape architecture, student has knowledge required for the understanding of social, economic, legal and other determinants outside the engineering field of architectural designing and urban planning, student can acquire information from field specific literature, data bases and other properly selected sources in Polish and English, can integrate the acquired information, interpret the said information, as well as draw conclusions and come up with opinions supported with satisfactory reason, student understands the need for lifelong learning, is aware of the social role of the architect and liability for affecting decisions.

## Course objective

Obtaining expanded knowledge of selected detailed issues of architectural and urban design as well as the principles of sustainable land management, taking into account the mitigation and adaptation of cities to climate change. • Awareness of climatic, environmental, economic and social threats and challenges related to anthropogenic climate change, as well as methods and tools for increasing the resilience of cities, including the role of urban ecosystems. • Understanding the latest trends in architecture and urban planning, especially regenerative design and bioclimatic architecture, and the integration of spatial planning, environmental protection and water management issues in municipal climate change adaptation plans. • Getting to know the methods and ways of implementing the latest scientific achievements in the field of architecture and urban planning as well as fields related to the field of study, including integrated urban water management, ecohydrology, urban climatology, flood and drought risk management, etc. • Obtaining theoretical knowledge necessary to develop a research project in the summer semester (research laboratory).

## Course-related learning outcomes

### Knowledge

B.W3. the role and importance of the natural environment in architectural and urban design and spatial planning, as well as the need to shape spatial order, sustainable development, and the subject of environmental and cultural landscape threats;

B.W4. issues related to architectural, urban and spatial planning, such as technical infrastructure, communication, natural environment, landscape architecture, economic, legal and social conditions - necessary for understanding social, economic, ecological, natural, historical, cultural, legal and other non-technical determinants of engineering activities and sees the need to take them into account in architectural, urban and rural design and spatial planning;

B.W7. theoretical basis of scientific reasoning and conducting research in the field useful for the implementation of complex design tasks, as well as the interpretation of scientific studies in the scientific discipline - architecture and town planning;

### Skills

B.U2. recognize the importance of non-technical aspects and effects of an architect's design activity, including its impact on the cultural and natural environment, and take responsibility for technical decisions made in the environment and for the transfer of cultural and natural heritage to future generations

B.U3. recognize systemic and non-technical aspects, including environmental, cultural, artistic, economic and legal aspects in the process of architectural, urban and planning design with a high degree of complexity;

B.U4. formulate statements of a critical analysis nature in the field of architecture, as well as present and synthetically describe the ideological basis of the project based on the assumptions made;3

### Social competences

B.S1. formulate and transfer information and opinions to the society on the achievements of architecture and town planning, their complex conditions and other aspects of the architect's activity;

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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The lectures end with an exam.

There are two exam dates, with the second date being a resit.

Formative assessment

- active participation in lectures
- the possibility of preparing a short research study - a case study
- test grade

Assessment scale: 2,0; 3,0; 3,5; 4,0; 4,5; 5,0

Summative assessment:

- exam grade covering the content provided during lectures

Assessment scale: 2,0; 3,0; 3,5; 4,0; 4,5; 5,0

## Programme content

Content of IPCC reports, scenarios and impacts of climate change. Mitigation and adaptation. Urban

resilience.

The specificity of urban climate and the relationship between the city structure and the intensity of hydro-meteorological phenomena.

Environmental transformations in the history of urban development and the consequences of urbanization of catchments and river valleys.

Urban water fronts and flood risk management.

Protection and regeneration of urban ecosystems. Blue-green network, NbS and their role in the city structure.

Sustainable rainwater management.

European and national urban policy.

## Course topics

1. Human-induced climate change - threats and challenges for cities. IPCC reports, scenarios and impacts of climate change. Mitigation and adaptation. European climate, environment and water policy. The specificity of urban environment and climate, meteorological phenomena, socio-economic and environmental threats. Urban plans of adaptation to climate change.

2. Transformations of the environment in the history of urban development. Hydrological and environmental consequences of urbanization. Transformations of urban structures, catchments and river valleys. Exposure and vulnerability. Introduction to integrated water and spatial management.

3. Urban waterfronts and flood management. Types of floods and reasons for the increase in flood hazards: hydrometeorological and anthropogenic. Flood risk management strategies. Buildings in coexistence with water - catchment approach in urban planning, amphibious architecture - case studies.

4. Protection and regeneration of urban ecosystems. The role of the river valley in the functional and spatial structure of the city - the interface between the natural and cultural environment. Causes and effects of the degradation of urban watercourses. Goals, methods and good practices of urban and natural revitalization. Blue-green networks and their role in the city structure. Nature based Solutions (NbS). Riverside buffer parks.

5. Water retention and sustainable rainwater management. Global trends in regenerative and watersensitive design (water-wise cities, sponge-cities, symbio-cities, biodiver-cities etc.). Catalog of forms of

SuDS / TRIO systems.

6. City climate. Urban heat island and heat waves. The role of buildings and green infrastructure in shaping climate-resilient cities. National urban policy. Strategies, costs and limits of adaptation. Bioclimatic architecture.

7. Multifunctional urban public space - resilience, inclusiveness, biodiversity, aesthetics. The perceptual and behavioral potential of water and greenery in an architectural composition.

8. Municipal plans of adaptation to climate change - integration of spatial planning, building standards, environmental protection and water management. Sensitivity of cities to the effects of climate change and their adaptation potential. Vulnerability assessment and risk analysis

## Teaching methods

1. Lecture with multimedia presentation

2. Case study

3. ekursy.put.poznan.pl (a system supporting the teaching process and distance learning)

## Bibliography

Basic

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  10. Plany adaptacji do zmian klimatu 44 miast polski. Publikacja podsumowująca. Ministerstwo Środowiska, Warszawa 2018, [www.44mpa.pl](http://www.44mpa.pl)
  11. Pötz H., Bleużé P., Urban green-blue grids for sustainable and dynamic cities, Coop For Life, Delft 2012.
- Additional**
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### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	18	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	32	1,50