

**DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND
TECHNOLOGY**

SUPERVISOR DECLARING/CONDUCTING COURSE: Barbara Widera
DEPARTMENT: Architecture
SCIENTIFIC DISCIPLINE: Architecture and Urban Planning

COURSE CARD

Course name in Polish: Architektura bioklimatyczna
Course name in English: Bioclimatic Architecture
Course language: Polish / English
University-wide general course type*:
The course is intended for all PhD students: YES / NO

- ~~1) BASIC COURSE~~
- 2) SPECIALIST COURSE**
- ~~3) SEMINAR~~
- ~~4) HUMANISTIC COURSE~~
- ~~5) LANGUAGE~~

Subject code: AUQ100165W

* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)	30			
Grading	Exam	Exam	Oral presentation	Exam, inspection, evaluation classes

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Is aware of the current state of knowledge and the latest development trends in contemporary ecological architecture

COURSE OBJECTIVES

C1 In-depth introduction to the bioclimatic architecture and its newest tendencies.

PROGRAM CONTENTS

Form of classes		Number of hours
Lec1	Cultural environment in the context of sustainable development	2
Lec2	Introduction to ecological and bioclimatic architecture	2
Lec3	Lessons from vernacular architecture	2
Lec4	Passive and low-energy architecture	2

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Lec5	Renewable energy sources and energy storage in building,	2
Lec6	Various aspects of user comfort in building, thermal comfort analysis	2
Lec7	Nature-based solutions in the context of the Green Deal and climate change resilience	2
Lec8	Energy efficiency in buildings, end-user engagement, POE	2
Lec9	Environmental strategies in bioclimatic architecture	2
Lec10	Multi-level ecosystem analyzes, integration of the building with its surroundings	2
Lec11	Green facades and vertical gardens	2
Lec12	Biomimetics in architecture	2
Lec13	Dynamic shading systems, kinetic facades	2
Lec14	Bioclimatic and biological architecture - development directions	2
Lec15	Evaluation - presentation of an individually developed topic	2
	Total hours	30

TEACHING TOOLS USED

N1. Informative lecture with elements of problem analysis
N2. Multimedia presentation
N3. Didactic discussion

ACHIEVED SUBJECT LEARNING OUTCOMES

Type of learning outcome	Code of learning outcome	Assessment of learning outcome
F1. Effect in terms of knowledge and skills	PEK_W01, P8S_WG PEK_W02, P8S_WG PEK_U01, P8S_UO	Evaluation of knowledge in the specialty field related to the bioclimatic architecture, as well as the knowledge and understanding of its main development trends, based on the presentation of individually developed topic as a form of oral examination.
F2. Effect in terms of skills and competences	PEK_U01, P8S_UO, PEK_K01 P8U_K	Evaluation of the ability to analyze bioclimatic architecture case studies and discuss related issues, on the basis of participation in the didactic discussion.

C (concluding) is a final examination grade and results from evaluations F1 and F2 (formative). Each of the partial evaluations is of equal weight.

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

- [1] Almusaed A., Biophilic and Bioclimatic Architecture: Analytical Therapy for the Next Generation of Passive Sustainable Architecture, Springer Science & Business Media, 2010
- [2] Baranowski, A., Projektowanie zrównoważone w architekturze, Gdańsk 1998.
- [3] Košir M., Climate Adaptability of Buildings: Bioclimatic Design in the Light of Climate Change Springer, 2019
- [4] Widera B., Proces kształtowania relacji z naturą w architekturze współczesnej, Wrocław 2018

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- [5] Wilkinson, S.J., Remøy H., Langston C., Sustainable Building Adaptation: Innovations in Decision-making, John Wiley & Sons, 2014
[6] Wines J., Zielona architektura, Taschen, Koln 2008

SECONDARY LITERATURE:

- [7] Bar-Cohen, Y., Biomimetics: Biologically Inspired Technologies, London 2005.
[8] Chan, Y., Sustainable Environments, Gloucester 2007.
[9] Gissen D., Big and Green: Toward Sustainable Architecture in the 21st Century, Princeton Architectural Press, 2002
[10] Guedes M.C., Cantuaria G. Bioclimatic Architecture in Warm Climates: A Guide for Best Practices in Africa, Springer, 2019
[11] Roaf S., Susan Roaf S., Crichton D., Nicol F., Adapting Buildings and Cities for Climate Change: A 21st Century Survival Guide, Routledge, 2005
[12] Yeang, K., EcoMasterplanning, Chichester 2009

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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