



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Sustainable building with universal design [N2Bud1>BZzPU]

### Course

Field of study

Civil Engineering

Year/Semester

1/2

Area of study (specialization)

Construction Engineering and Management

Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

### Number of hours

Lecture

10

Laboratory classes

10

Other

0

Tutorials

18

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

dr hab. inż. Barbara Ksit prof. PP  
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### Lecturers

### Prerequisites

Knowledge The basic knowledge from the construction engineering. Skills Best to design the building. Social competencies The consciousness of the necessity of continuous updating and supplementings of the building knowledge and engineer skills Basic information from the course: Universal Design I (1st cycle). The ability to obtain information from the indicated sources and readiness to cooperate as part of the team

### Course objective

The delivery the maximum of the knowledge from the contemporary construction engineering Lab - Provide students with basic knowledge of the principles of universal design, corresponding to the current social, economic and labor market needs. The aim of the course is to increase the acquired competences (knowledge and skills) by introducing new forms of education, based on a human-centered approach to designing private and public space.

### Course-related learning outcomes

Knowledge

1. Student knows rules of the creations of the ecological and sustainable construction objects.

2. Student knows rules of the creations of the energy-saving, passive and zeroenergy construction objects.
3. Student knows norms and guidelines of the designing of building objects and their elements.
4. Student knows and applies regulations of the construction law.
5. The student has a knowledge of the influence of construction investments realization on the environment.
6. The student has detailed knowledge of the principles of universal design.
7. The student has a basic knowledge of the possibilities and limitations in the functioning of people with various needs, both in biological, psychological and social aspects.

#### Skills

1. Student can select materials and technologies for the realization of the ecological and sustainable construction objects.
2. Student can select materials and technologies for the realization of the energy-saving, passive and zeroenergy construction objects.
3. Student can prepare and analyse the energy balance of the construction object.
4. The student knows how to empathize with the role of a person with limitations.
5. The student knows how to use GERT-type old age simulators.
6. The student can design a space prepared for people with limitations (the elderly, people with disabilities, parents with young children).
7. The student knows how to use computer software supporting the design process.

#### Social competence

1. Student independently supplements and extends the knowledge of within the range modern processes and technologies in construction.
2. Student is responsible for the honesty of obtained results of his own works and the estimation of works of the team subjected to him.
3. Student has a consciousness of the necessity of the lifting of professional and personal competences.
4. Student has a consciousness of the need of the sustainable development in construction.
5. Student understands the need of the transfer to the society of the construction knowledge.
6. The student sees the need to systematically deepen and expand their competences.
7. The student understands the need for teamwork in solving theoretical and practical problems.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Within the subject, classes are conducted as: lectures and exercises as a form of measurement / evaluation of the student's work, the following are carried out:

Lectures:

\* final tests

Rating scale specified% from:

90 very good (A)

80 good plus (B)

70 good (C)

60 sufficient plus (D)

50 sufficient (E)

below 50 insufficient (F)

In doubtful cases, the credit is extended to the oral part.

Auditorium exercises:

Defense of projects

Lab - The skills acquired during the laboratory classes are verified on the basis of a final test, a test consisting of 5 tasks with different scores depending on the degree of their difficulty, taking into account the principles of universal design for the selected object. Passing threshold: 50% of points.

### Programme content

Lecture: Basics of sustainable construction, Ecological construction. Building shape and energy efficiency, Green walls and roofs.

Certification, Rech, certificates, Acoustics-basics

Exercises:

Execution of the certificate

Lab - Workshops with the use of GERT-type old age simulators, which allow young people to survive and understand age-related limitations by simulating changes in the human body. During the course, students

will be able to personally test various types of aids allowing for age simulation, simulation of hemiparesis, simulation of back pain, spine defect simulation, simulation of dyspnea in chronic obstructive pulmonary disease (COPD), simulations of hearing loss and tinnitus, simulations of visual impairment, simulations hand tremors, unsteady gait simulations, knee mobility restriction simulations, knee pain simulations. People who try the above-mentioned simulators will be able to feel the difficulties faced by people with limitations. Students dressed in the above-mentioned simulators will explore the facilities of the Poznań University of Technology, paying particular attention to the availability of sanitary facilities, lifts, etc. They will feel first hand what difficulties people with various limitations may encounter, which will facilitate their approach to designing public buildings.

## Course topics

Basics of sustainable construction  
Earth construction (ecological)  
Building shape and energy efficiency,  
Green walls and roofs.  
Sustainable certification, Rech,  
energy certificates  
Acoustics - basics  
Transparent partitions

## Teaching methods

Lecture / problem lecture / lectures with multimedia presentation  
Exercises / exercises involving the use of professional literature, standards, the Act - calculation of HD heat losses and the average heat transfer coefficient for the building, taking into account linear bridges, acoustic insulation of the partition.  
Lab - workshop, Discussion, multimedia presentation, work with source materials, work with tools for creating a bibliography

## Bibliography

- Basic
1. T. Błaszczyński B. Ksist L. Grzegorzczak, Nowa certyfikacja Energetyczna Budynków jako element budownictwa zrównoważonego PP, Poznań 2018
  2. A. Kaliszek-Wietecha, Budownictwo zrównoważone. Wybrane zagadnienia z fizyki budowli. Wyd. 1 PWN 2016
  3. Pakiet do projektowania budynków pasywnych PHPP, PIBP, 2006
  4. Ustawa z dnia 19 lipca 2019 r. o zapewnianiu dostępności osobom ze szczególnymi potrzebami (Dz. U. 2019 poz. 1696)
  5. Rozporządzenie Ministra Infrastruktury z dnia 12 kwietnia 2002 r. w sprawie warunków technicznych, jakim powinny odpowiadać budynki i ich usytuowanie (Dz. U. z 7 czerwca 2019, poz. 1065)
  6. „Włącznik projektowanie bez barier”. Kamil Kowalski, Fundacja Integracja. Warszawa, wydanie 11.2017. Dostęp online:
  7. <http://www.integracja.org/wp-content/uploads/2017/12/W%C5%82%C4%85cznik-projektowanie-bez-barier.pdf>
  8. „Standardy dostępności budynków dla osób z niepełnosprawnościami” - uwzględniając koncepcję uniwersalnego projektowania – poradnik. Wydany przez Ministerstwo Infrastruktury i Budownictwa, jako kodeks dobrych praktyk. 4 / 4 Warszawa, 04.2018.
- Additional
1. praca zbiorowa pod red. J. Karyś, Ochrona przed wilgocią i korozją biologiczną w budownictwie Medium Warszawa 2014
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  4. J. Nurzyński, Akustyka w budownictwie, Wydawnictwo Naukowe PWN 2018
  5. Standardy dostępności przyjęte przez JST w Polsce (np. Gdynia, Warszawa, Łódź, Wrocław), np.: „Standardy dostępności dla miasta stołecznego Warszawy, Warszawa, 23.10.2017. Dostęp online: [https://polskabezbarier.org/documents/standardy\\_dostepnosci\\_warszawa.pdf](https://polskabezbarier.org/documents/standardy_dostepnosci_warszawa.pdf)
  6. „Standardy dostępności dla polityki spójności 2014 – 2020”. Załącznik nr 2 Standardy dostępności dla polityki spójności 2014-2020 dotyczące takich obszarów jak: cyfryzacja, transport, architektura, edukacja,

szkolenia, informacja i promocja wydany przez Ministerstwo Inwestycji i Rozwoju. Warszawa, 11.04.2018.  
Dostęp online: <https://www.poir.gov.pl/media/56123/>  
Zalacznik\_nr\_2\_do\_Wytycznych\_w\_zakresie\_rownosci\_szans\_i\_niedyskryminacji.pdf

### Breakdown of average student's workload

	Hours	ECTS
Total workload	80	3,00
Classes requiring direct contact with the teacher	38	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	42	1,50