SYLLABUS

Name: ***Buildings and Phisics of Buildings (BudAB>SI4BUPHBU19)***
Name in Polish:
Name in English: ***Buildings and Phisics of Buildings***

Information on course:

Course offered by department: Faculty of Civil Engineering
Course for department: Silesian University of Technology
Term: Summer semester 2025/2026
Cordinator of course edition: Dr hab. inż. Jerzy Bochen

Default type of course examination report:

EGZ

Language:

English

Course homepage:

https://platforma.polsl.pl/rb/

Short description:

The subject concerns the principles of designing buildings with traditional technology, their main structural elements, taking into account appropriate insulation in the light of applicable regulations and standards.
The aim of the course is to familiarize with the basic concepts and principles in the field of technical solutions and designing basic structural elements and more important finishing elements of buildings, in particular insulations.
Knowledge in the field of the subject is delivered at the lecture. The application of knowledge and the acquisition of practical skills are used in design exercises, which are carried out by the blackboard exercises providing design guidelines and making the project.
Project is about of selected building elements of four-storey apartment building.

Description:

Semester 4:
LECTURES: 30 hours, subjects:
1) Flat roofs: constr. types, ventilation, thermal dilatations.
2) Terraces: typical and reversed, types and design rules.
3) Balconies, design rules.
4) Industrial floors, construction and design principles.
5) Windows, basic properties and problems.
6) Glass facades in buildings.
7) Heat flow in materials and building components, thermal conductivity in the single and multi-layered construction.
8) Convection - heat exchange between the surface and the air, radiation heat transfer between the surfaces.
9) Thermal properties of typical building materials, thermal insulation materials, thermal bridges, heat flow by a structural wall - air cavities in the building elements, U-value calculations (PN EN ISO 6946), requirements for thermal insulation.
10) Moisture analysis of buildings elements - surface condensation, basics of the Glaser methods, an analysis of interstitial condensation, frsi factor calculation (PN EN 13788), requirements for moisture resistance.

Subjects of classes and project:
1) Introductions with explanations to design of selected elements in the project of a building.
2) Presentation with discussion of rules for analyses of thermal insulations of basic partitions in buildings.
3) Project of selected building elements of four-storey apartment building. Preparing drawings and thermal calculations in accordance to the guidelines.

Bibliography:

Polish literature:
[1] Moj E., Śliwiński M.: „Podstawy Budownictwa, Cz.1, Skrypt dla studentów wyższych szkół technicznych”. Kraków: Wydawnictwo Politechniki Krakowskiej, 1997.
[2] Byrdy C., Kram D., Korepta K., Śliwiński M.: „Podstawy Budownictwa, Cz.2, Skrypt dla studentów wyższych szkół technicznych”. Kraków: Wyd. Politechniki Krakowskiej, 1997.
[3] Klemm P. : „Budownictwo ogólne. Tom 2, Fizyka budowli”. Warszawa: Arkady, 2005.
[4] Lichołaj L. : „Budownictwo ogólne. Tom 3. Elementy budynków podstawy projektowania ”. Warszawa: Arkady, 2008.
[5] Buczkowski W. : Budownictwo ogólne. Konstrukcje budynków, Tom 4, Warszawa: Arkady, 2009.
[6] Schabowicz K., Gorzelańczyk T.: „Materiały do ćwiczeń z budownictwa ogólnego”. Wrocław: Dolnośląskie Wydawnictwo Edukacyjne, 2009.

Foreign literature:
[1] Emmitt S., Gorse C.: Barry’s Introduction to Construction of Buildings. 4th edition, Oxford: Blakwell Publishing, 2007,
[2] Chudley R., Greeno R.: Building construction handbook. Incorporating current building & construction regulations.
6th edition Burlington: Elsevier Butterworth – Heinemann, 2006.

Learning outcomes:

Semester 4:
KNOWLEDGE
(1) Knows standards for construction designing and basic regulations in area of the technical requirements, [dirrectional effect K1A_W01]
(2) Knows rules for designing of basic building's construction elements with regard to foundations and insulations, [dirrectional effect K1A_W01]

SKILLS
(3) Can design basic building's construction elements with regard to appropriate insulations, [dirrectional effect K1A_U01]
(4) Can make technical drawings such as: plans, cross sections and details, [dirrectional effect K1A_U05]
(5) Can make a decision on choosing of building materials for different elements in buildings with regard of their function, affecting the durability of building components [dirrectional effect K1A_U08]

Assessment methods and assessment criteria:

REGUIREMENTS FOR PASSING THE COURSE
ENTRANCE REQUIREMENTS: Passing the subject : "Buildings and physics of buildings" in sem.3
1) Passing the classes and project on the base of presence during classes and consultations, verifications and defence completed drawings in terms pointed by the tutor, and getting all positive grades.
-- Attending the classes and project is obligatory.
-- Agreement with design principles, standards and regulations and graphical quality of drawings are taken into consideration.
2) Passing the project on the base of positive grade of each element. Mark of the project is average of all partial marks.
-- Retake of drawings with errors or not delivered in appropriate terms is possible during consultations determined by the tutor.
3) Passing the lectures and classes on the base a positive valuation of the final written test - exam.
• 50% of maximum grade is required to get a positive valuation of the exam.
• The written test (exam) is possible twice,

FINAL MARK:
50% (project) + 50% (exam)

To have partial grades transferred, students should contact the teacher within the first two weeks of the semester.
The syllabus is valid from the winter semester of the 2025/2026 academic year, and its content is not subject to change during the semester.

Information on course edition:

Default type of course examination report:

ZAL

Homepage of course edition:

https://platforma.polsl.pl/rb/

Short description:

The subject concerns the principles of designing buildings with traditional technology, their main structural elements, taking into account appropriate insulation in the light of applicable regulations and standards.
The aim of the course is to familiarize with the basic concepts and principles in the field of technical solutions and designing basic structural elements and more important finishing elements of buildings, in particular insulations.
Knowledge in the field of the subject is delivered at the lecture. The application of knowledge and the acquisition of practical skills are used in design exercises, which are carried out by the blackboard exercises providing design guidelines and making the project.
Project is about of selected building elements of four-storey apartment building.

Description:

Semester 4:
LECTURES: 30 hours, subject of lectures:
1) Flat roofs: constr. types, ventilation, thermal dilatations.
2) Terraces: typical and reversed, types and design rules.
3) Balconies, design rules.
4) Industrial floors, construction and design principles.
5) Windows, basic properties and problems.
6) Glass facades in buildings.
7) Heat flow in materials and building components, thermal conductivity in the single and multi-layered construction.
8) Convection - heat exchange between the surface and the air, radiation heat transfer between the surfaces.
9) Thermal properties of typical building materials, thermal insulation materials, thermal bridges, heat flow by a structural wall - air cavities in the building elements, U-value calculations (PN EN ISO 6946), requirements for thermal insulation.
10) Moisture analysis of buildings elements - surface condensation, basics of the Glaser methods, an analysis of interstitial condensation, frsi factor calculation (PN EN 13788), requirements for moisture resistance.

CLASSES 5 hours and PROJECT 25 hours:
1) Introductions with explanations to design of selected elements in the project of a building.
2) Presentation with discussion of rules for analyses of thermal insulations of basic partitions in buildings.
3) Project of selected building elements of four-storey apartment building. Preparing drawings and thermal calculations in accordance to the guidelines.

Notes:

Lectures and tutarials are delivered by two tutors in two parts:
Part 1 - Buildings, Part 2 - Physics of buildings.
Subject delivered in stationary way with help the teaching Platform.

Details of classes and study groups

lecture (30 hours)

The classes homepage

https://platforma.polsl.pl/rb/

Bibliography:

Polish literature:
[1] Moj E., Śliwiński M.: „Podstawy Budownictwa, Cz.1, Skrypt dla studentów wyższych szkół technicznych”. Kraków: Wydawnictwo Politechniki Krakowskiej, 1997.
[2] Byrdy C., Kram D., Korepta K., Śliwiński M.: „Podstawy Budownictwa, Cz.2, Skrypt dla studentów wyższych szkół technicznych”. Kraków: Wyd. Politechniki Krakowskiej, 1997.
[3] Klemm P. : „Budownictwo ogólne. Tom 2, Fizyka budowli”. Warszawa: Arkady, 2005.
[4] Lichołaj L. : „Budownictwo ogólne. Tom 3. Elementy budynków podstawy projektowania ”. Warszawa: Arkady, 2008.
[5] Buczkowski W. : Budownictwo ogólne. Konstrukcje budynków, Tom 4, Warszawa: Arkady, 2009.
[6] Schabowicz K., Gorzelańczyk T.: „Materiały do ćwiczeń z budownictwa ogólnego”. Wrocław: Dolnośląskie Wydawnictwo Edukacyjne, 2009.

Foreign literature:
[1] Emmitt S., Gorse C.: Barry’s Introduction to Construction of Buildings. 4th edition, Oxford: Blakwell Publishing, 2007,

[2] Chudley R., Greeno R.: Building construction handbook. Incorporating current building & construction regulations.
6th edition Burlington: Elsevier Butterworth – Heinemann, 2006.

Learning outcomes:

Semester 4:
KNOWLEDGE
(1) Knows standards for construction designing and basic regulations in area of the technical requirements, [dirrectional effect K1A_W01]
(2) Knows rules for designing of basic building's construction elements with regard to foundations and insulations, [dirrectional effect K1A_W01]

Assessment methods and assessment criteria:

REQUIREMENTS FOR PASSING THE LECTURES
ENTRANCE REQUIREMENTS: Passing the subject : "Buildings and physics of buildings" in sem.3
1) Learning effects of lectures are revised by Exam together with learning effects of the classes.
Minimum level to pass is 50% of total number of points to get.
The retake Exam is possible twice.

To have partial grade transferred, students should contact the teacher within the first two weeks of the semester.
The syllabus is valid from the winter semester of the 2025/2026 academic year, and its content is not subject to change during the semester.

Classes topics:

Semester 4:
1) Flat roofs: constr. types, ventilation, thermal dilatations.
2) Terraces: typical and reversed, types and design rules.
3) Balconies, design rules.
4) Industrial floors, construction and design principles.
5) Windows, basic properties and problems.
6) Glass facades in buildings.
7) Heat flow in materials and building components, thermal conductivity in the single and multi-layered construction.
8) Convection - heat exchange between the surface and the air, radiation heat transfer between the surfaces.
9) Thermal properties of typical building materials, thermal insulation materials, thermal bridges, heat flow by a structural wall - air cavities in the building elements, U-value calculations (PN EN ISO 6946), requirements for thermal insulation.
10) Moisture analysis of buildings elements - surface condensation, basics of the Glaser methods, an analysis of interstitial condensation, frsi factor calculation (PN EN 13788), requirements for moisture resistance.

Teaching methods:

Method of delivering.
Tools: multimedia presentations.

Study groups details

missing study groups details

classes (5 hours)

The classes homepage

https://platforma.polsl.pl/rb/

Bibliography:

Polish literature:
[1] Moj E., Śliwiński M.: „Podstawy Budownictwa, Cz.1, Skrypt dla studentów wyższych szkół technicznych”. Kraków: Wydawnictwo Politechniki Krakowskiej, 1997.
[2] Byrdy C., Kram D., Korepta K., Śliwiński M.: „Podstawy Budownictwa, Cz.2, Skrypt dla studentów wyższych szkół technicznych”. Kraków: Wyd. Politechniki Krakowskiej, 1997.
[3] Klemm P. : „Budownictwo ogólne. Tom 2, Fizyka budowli”. Warszawa: Arkady, 2005.
[4] Lichołaj L. : „Budownictwo ogólne. Tom 3. Elementy budynków podstawy projektowania ”. Warszawa: Arkady, 2008.
[5] Buczkowski W. : Budownictwo ogólne. Konstrukcje budynków, Tom 4, Warszawa: Arkady, 2009.
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[2] Chudley R., Greeno R.: Building construction handbook. Incorporating current building & construction regulations.
6th edition Burlington: Elsevier Butterworth – Heinemann, 2006.

Learning outcomes:

Semester 4:
KNOWLEDGE
(1) Knows standards for construction designing and basic regulations in area of the technical requirements, [dirrectional effect K1A_W01]
(2) Knows rules for designing of basic building's construction elements with regard to foundations and insulations, [dirrectional effect K1A_W01]

SKILLS
(3) Can design basic building's construction elements with regard to appropriate insulations, [dirrectional effect K1A_U01]
(4) Can make technical drawings such as: plans, cross sections and details, [dirrectional effect K1A_U05]
(5) Can make a decision on choosing of building materials for different elements in buildings with regard of their function, affecting the durability of building components [dirrectional effect K1A_U08]

Assessment methods and assessment criteria:

REQUIREMENTS FOR PASSING THE CLASSES
ENTRANCE REQUIREMENTS: Passing the subject : "Buildings and physics of buildings" in sem.3
1) Passing the classes on the base of presence during classes, completing the project and passing the final test.
• Attending the classes is obligatory.

• Agreement with design principles, standards and regulations and graphical quality of drawings are taken into consideration.
2) Passing the classes on the base a positive valuation of the exam,
• 50% of maximum grade is required to get a positive valuation of the test.
• The written test is possible twice.

FINAL MARK
50% (project) + 50% (exam)

To have partial grades transferred, students should contact the teacher within the first two weeks of the semester.
The syllabus is valid from the winter semester of the 2025/2026 academic year, and its content is not subject to change during the semester.

Classes topics:

Semester 4:
1) Introductions with explanations to design of selected elements in the project of a building.
2) Presentation with discussion of rules for analyses of thermal insulations of basic partitions in buildings.
3) Project of selected building elements of four-storey apartment building. Preparing drawings and thermal calculations in accordance to the guidelines.

Teaching methods:

Flipped Based Learning
Tools: blackboard and Platform of remote teaching

Study groups details

missing study groups details

project (25 hours)

The classes homepage

https://platforma.polsl.pl/rb/

Bibliography:

Polish literature:
[1] Moj E., Śliwiński M.: „Podstawy Budownictwa, Cz.1, Skrypt dla studentów wyższych szkół technicznych". Kraków: Wydawnictwo Politechniki Krakowskiej, 1997.
[2] Byrdy C., Kram D., Korepta K., Śliwiński M.: „Podstawy Budownictwa, Cz.2, Skrypt dla studentów wyższych szkół technicznych". Kraków: Wyd. Politechniki Krakowskiej, 1997.
[3] Klemm P. : „Budownictwo ogólne. Tom 2, Fizyka budowli". Warszawa: Arkady, 2005.
[4] Lichołaj L. : „Budownictwo ogólne. Tom 3. Elementy budynków podstawy projektowania ". Warszawa: Arkady, 2008.
[5] Buczkowski W. : Budownictwo ogólne. Konstrukcje budynków, Tom 4, Warszawa: Arkady, 2009.
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[2] Chudley R., Greeno R.: Building construction handbook. Incorporating current building & construction regulations.
6th edition Burlington: Elsevier Butterworth – Heinemann, 2006.

Learning outcomes:

Semester 4:
(1) Can design basic building's construction elements with regard to appropriate insulations, [dirrectional effect K1A_U01]
(2) Can make technical drawings such as: plans, cross sections and details, [dirrectional effect K1A_U05]
(3) Can make a decision on choosing of building materials for different elements in buildings with regard of their function, affecting the durability of building components [dirrectional effect K1A_U08]

Assessment methods and assessment criteria:

REQUIREMENTS FOR PASSING THE PROJECT
ENTRANCE REQUIREMENTS: Passing the subject : "Buildings and physics of buildings" in sem.3
1) Passing the project on the base of presence during classes and consultations, verifications and defence completed drawings in terms pointed by the tutor, and getting all positive grades.
• Attending the project tutorials is obligatory.
• Agreement with design principles, standards and regulations and graphical quality of drawings are taken into consideration.
• Retake of drawings with errors or not delivered in appropriate terms is possible during consultations determined by the tutor.
2) Passing the project on the base of positive grade of each element. Mark of the project is average of all partial marks.

To have partial project grade transferred, students should contact the teacher within the first two weeks of the semester.
The syllabus is valid from the winter semester of the 2025/2026 academic year, and its content is not subject to change during the semester.

Classes topics:

Semester 4:
1) Introductions with explanations to design of selected elements in the project of a building.
2) Presentation with discussion of rules for analyses of thermal insulations of basic partitions in buildings.
3) Project of selected building elements of four-storey apartment building. Preparing drawings and thermal calculations in accordance to the guidelines.

Teaching methods:

Project Based Learning
Tools: consultations and revisions.

Study groups details

missing study groups details

Element of course groups in various terms:

Course group description	First term	Last term
missing group description in English (BudAB-S1-2019-sem4)	2020/2021-L	

Course credits in various terms:

<without a specific program>

Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	4	2020/2021-Z	