



Erasmus+

Virtual and Intensive Course  
Developing Practical Skills  
of Future Engineers

**VIPSKILLS**  
Erasmus+ 2016-1-PL01-KA203-026152



## LIST OF INTELLECTUAL OUTPUTS

- ALL MATERIALS ARE AVAILABLE ON THE PROJECT WEBPAGE

[www.vipskills.pb.edu.pl](http://www.vipskills.pb.edu.pl)

Below we present a list of VIPSKILLS project results.

Our Intellectual Outputs include:

- didactic materials (IO1);
- e-learning including e-laboratories (IO2);
- Syllabus of VIPSKILLS Summer School (IO6);
- a small Polish-English-Lithuanian-Spanish technical dictionary (IO3) with vocabulary used during the course;
- a book “Buildings 2020+ Part 1 and 2 (IO7), dedicated to teachers and students from Environmental, Civil and Energy Engineering to be helpful on different subjects, as well as on courses like VIPSKILLS Summer School.

IO1 – didactic materials		Module in Syllabus
Lab1	Wind energy- Determination of current-voltage characteristics of the aero-generator	Renewable energy sources (a team task under a supervision of the teacher)
Lab2	Wind energy- The effect on power output of a wind turbine when changing the wind speed	Renewable energy sources (a team task under a supervision of the teacher)
Lab3	Wind energy- Investigation of the power generated by the aero-generator depending on the number of blades	Renewable energy sources (a team task under a supervision of the teacher)
Lab4	Efficiency of flat-plate solar collector - introduction	Renewable energy sources (a team task under a supervision of the teacher)
Lab5	Parameters of photovoltaic panels - experiment	Renewable energy sources (a team task under a supervision of the teacher)
Lab6	Efficiency of flat-plate solar collector - experiment	Renewable energy sources (a team task under a supervision of the teacher)
Lab7	Heat pumps - efficiency	Renewable energy sources (a team task under a supervision of the teacher)
Lab8	Parameters of photovoltaic panels- introduction	Renewable energy sources (a team task under a supervision of the teacher)
Lab9	Head and minor losses in pipes	Domestic hot water (DHW) (a team task under a supervision of the teacher)
W1	Cost of HVAC system	Heating systems (results to be used as a part of the team project of the low energy and eco-friendly house)



IO1 – didactic materials		Module in Syllabus
W2	Full cold load calculations	Heat/cool losses and load Energy efficiency (results to be used as a part of the team project of the low energy and eco-friendly house)
W3	Emissions	Materials used during different modules
W4	Energy Efficiency in HVAC Air Systems	Materials used during different modules (results to be used as a part of the team project of the low energy and eco-friendly house)
W5	Solar radiation	Renewable energy sources
W6	Solar radiation losses	Renewable energy sources – additional materials
W7	Solar collector -DHW	Domestic hot water (DHW) (results to be used as a part of the team project of the low energy and eco-friendly house)
W8	Simple cold load calculations	Heat/cool losses and load Energy efficiency (results to be used as a part of the team project of the low energy and eco-friendly house)
W9	Test – energy efficiency in a house	Materials used during different modules
W10	Project - Energy Efficiency in HVAC Air Systems	Materials used during different modules
W11	Boilers 1	Renewable energy sources – additional materials
W12	Boilers 2	Renewable energy sources - additional materials
W13	Boilers 3	Renewable energy sources - additional materials
W14	Boilers 4	Renewable energy sources - additional materials
W15	Solar collectors 2	Renewable energy sources - additional materials
W16	Architecture – houses - concept	High efficiency buildings- architecture, materials, constructions (results to be used as a part of the team project of low energy and eco-friendly house)
W17	GIS	GIS (results to be used as a part of the team project of the low energy and eco-friendly house)
W18	Architecture – houses A	High efficiency buildings- architecture, materials, constructions (results to be used as a part of the team project of low energy and eco-friendly house)
P1	Good/bad examples	Heating systems (Materials to discuss most common mistakes in HVAC systems)
P2	Cold load	Heat/cool losses and load. Energy efficiency
P3	Heating systems	Heating systems (materials to allow students selection of the best heating system for the team low energy and eco-friendly house)
P4	Future of energy storage	Installations in buildings. Central management



IO1 – didactic materials		Module in Syllabus
		(materials to allow students consideration of the best heating system for the team low energy and eco-friendly house)
P5	Modern structural materials for civil engineering	High efficiency buildings- architecture, materials, constructions (materials to allow students select the best heating system for the team low energy and eco-friendly house)
P6	Constructions	High efficiency buildings- architecture, materials, constructions (materials to allow students select the best heating system for the team low energy and eco-friendly house)
P7	Hot-cold water supply	Domestic hot water (DHW)
P8	Solar radiation	Renewable energy sources (additional materials)
P9	Lecture - Energy Efficiency in HVAC Air Systems	Materials used during different modules
P10	Improvements of building efficiency	Materials used during different modules (materials to allow students analyses of factors influencing efficiency of their team low energy and eco-friendly houses)
P11	Main factors influencing energy consumption	Materials used during different modules (materials to allow students analyses of factors influencing efficiency of their team low energy and eco-friendly houses)
P12	Efficiency factors, certificates	Materials used during different modules (materials to allow students analyses of factors influencing efficiency of their team low energy and eco-friendly houses)
P13	Energy management	Installations in buildings Central management
P14	Emissions	Materials used during different modules
P15	Isolations	High efficiency buildings- architecture, materials, constructions (materials to allow students selection of isolation type and thickness for the team low energy and eco-friendly house)
P16	European energy Market	Installations in buildings Central management
P17	Solar collectors	Materials used during different modules
P18	Biomass 1	Additional Materials
P19	Biomass 2	Additional Materials
P20	Biomass 3	Additional Materials
P21	Heat pumps 1	Renewable energy sources
P22	Heat pumps 2	Renewable energy sources



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IO1 – didactic materials		Module in Syllabus
P23	Heating 3	Heating systems (additional materials)
P24	DHW	Domestic hot water (DHW)
P25	Ventilation and air conditioning	Air-conditioning
P26	CO2	High efficiency buildings- architecture, materials, constructions (additional materials)
P27	CDW	High efficiency buildings- architecture, materials, constructions (additional materials)
P28	Heating 2	Heating systems (additional materials)
P29	PV and wind	Renewable energy sources
P30	Energy cost in a house	Materials used during different modules
P31	Wind energy	Renewable energy sources
P32	Houses of the future	High efficiency buildings- architecture, materials, constructions
P33	House with atrium	High efficiency buildings- architecture, materials, constructions
P34	Presentation skills	Additional Materials
P35	Preparing a successful presentation	Additional Materials
P36	Preparing a successful presentation. Examples	Additional Materials
P37	English skills	Additional Materials

IO2 – e-learning		Module in Syllabus
AIR POLLUTION	AIR POLLUTION1	Emissions, Cost of energy in a house, Efficiency factor vs required values,
	TESTS	
BOILERS	Boilers1	Boilers
	Boilers2	
	Boilers3	
	Boilers4	
	TESTS	
E-LAB	E-LAB 1	e-labs  E-laboratories could be used both, during e-learning as tasks for students, and during face-to-face classes to analyse parameters of systems together with teachers
	E-LAB 2	
	E-LAB 3	
	E-LAB 4	
	E-LAB 5	
	E-LAB 6	
	TESTS	
ENERGY MANAGEMENT	Ecoanalysis PV installation	Emissions, Cost of energy in a house, Efficiency factor vs required values
	Housing energy management	
	PV Production to Market	
	RNW housing	



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ENERGY STORAGE	Energy storage1	Energy storage
	Energy storage2	
	Energy storage3	
	TESTS	
GAS INSTALLATION	Gas Installation1	Additional material
	Gas Installation2	
	Gas Installation3	Materials recommended for students who don't have advanced knowledge about gas installations
	Gas Installation4	
	TESTS	
HEAT RECOVERY	Heat recovery1	Emissions, Cost of energy in a house, Efficiency factor vs required values
	Heat recovery2	
	Heat recovery3	
	TESTS	
NETWORKS	NETWORKS 1	Networks (water, heat, electricity)
	TESTS	
NOISE AND VIBRATION PROTECTION	Noise And Vibration Protection	Additional materials
	Noise Protection	
	Results air damper	Materials recommended for students interested in issues of the environmental comfort.
	Results vent.	
	TEST	
VENTILATION	Ventilation1	Additional materials Materials recommended for students who don't have advanced knowledge about ventilation
	TEST	

ALL MAIN MATERIALS ARE PREPARED IN ENGLISH, POLISH, SPANISH AND LITHUANIAN.

ON THE PROJECT WEBPAGE YOU CAN ALSO FIND ADDITIONAL MATERIALS IN ENGLISH AND SELECTED NATIONAL LANGUAGES.

**103**

SMALL TECHNICAL POLISH-ENGLISH-SPANISH-LITHUANIAN DICTIONARY

**106**

SYLLABUS OF VIPSKILLS COURSE IN POLISH, ENGLISH, SPANISH AND LITHUANIAN

**107**

**BOOK BUILDINGS 2020+**

PART 1 Buildings 2020+. Constructions, materials and installations IN ENGLISH,  
PART 2 Buildings 2020+. Energy sources IN ENGLISH



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