





ADD-ON-SKILLS: Advanced Digital design course ON modern buildings developing SKILLS for young engineers

SUMMER SCHOOL June - July 2022

















ONLINE LECTURES

- 5 Modules (1 for each HEI)
- BUT: Modern, low-energy buildings with application of environmentally-friendly solutions; HVAC systems and renewable energy sources;
- VDTK: Building Information Modeling (BIM) fundamentals, concepts of modeling;
- 3. **RTA**: Internet of Things (IoT) and its application in modern buildings
- 4. UNIFI: Buildings Sustainable development
- 5. UCO: Green buildings and management of energy consumption

Test - Game - Video to conclude Online learning







Changes in buildings over the years; Buildings energy balance and main energy factors; Selection of the optimal HVAC system for different building types; Main characteristics of wind turbines and solar collectors. Biological treatment plants.

Basic principles of Building Information Modeling (BIM); Management requirements; Projects organization; Toolbox; Templates and Standards; BIM execution plan.





Introduction to programming with C++; Theoretical aspects of programming in Arduino environment; Work with Wokwi simulator; Monitoring of temperature and gas changes with IoT; Circuito.io.

RTA

The concept of sustainability; Sustainability in constructions; Sustainable school building design; Different technological solutions for the external walls detailing all components and characteristics.





Green roofs: main technological solutions, characteristics, legislation background; IAQ and ventilation in buildings; European Energy markets; installations in buildings, efficiency factors; sources for electricity.





FACE-TO-FACE CLASSES:



...the Beginning...

Politechnika Bialostocka







LABS: HVAC systems design and Renewable energy Data collection from PV system and solar collectors – Design of a heating system







BIM WORKSHOP: Quiz -Common data environment - BIM execution plan





WORKSHOP: Smart devices for houses – Temperature measure with Arduino











Temperature





WORKSHOP: Design of a green roof – sizing PV system







Politechnika Bialostocka...







Learning by visiting...







Learning by visiting...







...some SKILLS

1. Student is able to be creative and entrepreneurial, cooperate and work in a group, assuming different roles in it.

2. Student is able to use acquired knowledge for critical analysis, synthesis, creative interpretation and presentation of issues in the field of environmental engineering and modern construction.

3. Student is able to act in an entrepreneurial way through training and improving professional competences, and initiate activities aimed at using their knowledge and skills.

4. Student is ready to analyze the content obtained from various sources, as well as to critically evaluate it and use it in professional work.

5. Properly plan research, perform it, interpret its results and draw correct conclusions on this basis.

6. Communicate effectively in a variety of intercultural contexts, reflect critically on stereotypical perceptions of reality, and to accept diversity and differing points of view

7. Formulate and communicate to the public, in a commonly understood way, information and opinions concerning scientific achievements as well as other aspects of the engineer's activities, presenting different points of view





...finally some FUN...



See you next summer school...





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DICEA DIPARTIMENTO DI INGEGNERIA CIVILE E AMBIENTALE

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