

## **CREATIVE PHYSICS AND TECHNOLOGY ON THE FACULTY OF POWER AND AERONAUTICAL ENGINEERING OF THE WARSAW UNIVERSITY OF TECHNOLOGY**

**Chrobocińska P., project coordinator,**  
**Grzebielec A., associate professor,**  
**Rusowicz A., associate professor**  
*Warsaw University of Technology, Poland*

In the school year 2018/2019, over 150 students aged 13-16 from six primary schools and secondary schools in Warsaw and the surrounding area took part in the project "Creative Physics and Technology - a programme for the creation of future Responsible Development of Poland".

The project is being implemented by the Faculty of Power and Aeronautical Engineering of the Warsaw University of Technology [1] as part of a grant obtained from the European Union from the funds of the Operational Programme Knowledge Education Development.

The aim of the project "Creative Physics and Technology - a programme for the creation of future Responsible Development of Poland" is to popularize science and improve students' competences and skills, with regard to the implementation of the so-called third mission of a higher education institution. It consists in shaping and creating mutual relations with the environment through the involvement of the university in the processes of social development and inscribes itself as follows, in the responsibility of universities for the social and economic development of the country and society.

During the project, the pupils participated in 16 hours of lectures:

"Cosmonautics of the 21st century"

"Energy of the 21st century"

"Robotics of the 21st century"

"Aviation of the 21st century".

and 26 hours of practical laboratory classes:

Laboratory of Thermodynamics

Laboratory of Energy Efficiency

Laboratory of Refrigeration and Solar Energy

Laboratory of Aerodynamics

Laboratory of Symulators

Laboratory of Robotics and Biorobotic Systems

Laboratory of Mechanics

Laboratory of 3D modeling.

The classes were conducted both in schools and in the laboratory facilities of the Faculty [2], with the participation of 27 academic teachers, technical and administrative employees and doctoral students of the Faculty of Power and Aeronautical Engineering. After the end of the lecture and laboratory classes, the students prepared short reports and solved knowledge tests to summarize their knowledge. Analytical skills, creative and logical thinking and cognitive skills, including the ability to formulate and ask questions, are important and desirable characteristics that give children and young people the chance to better assimilate knowledge, to learn more quickly and to remember the information they have acquired.

Workshop classes focused on "experience - conclusions" show the way to independent searching for answers in action, developing their independence and precision of thinking.

The activities within the project contribute to:

- arousing cognitive curiosity of students;
- stimulating intellectual, axiological and social development of the young generation; inspire students to think creatively and develop their interests and passions;
- promotion of the culture of innovation;
- acquaintance with the academic environment and the university as a place of scientific observation of reality;
- integration of the local community around academic centres by creating conditions for conducting organized extracurricular educational, research or popularization activities by scientific units or entities acting for the benefit of science which have not conducted such activities so far, as well as for supporting activities and improving the quality of already conducted activities.

Pupils covered by the support come from different backgrounds and families - for some of them, participation in the project may prove to be the only chance of contact with a higher education institution, therefore, the organizers of the classes have prepared diplomas of participation in classes at the Warsaw University of Technology for each student.

An important added value of schools' participation in the project is the opportunity to deepen the knowledge and skills of teachers in modern and innovative educational techniques, whose elements they can implement in their curricula.

This year's edition of the project has come to an end and will be continued from the new school year 2019/2020.

### References

1. Arczewski, K., Banaszek, J., Bogdański, S., Domański, R., Frączek, J., Goraj, Z., ... Zielińska, T. (2010). *1960-2010: 50 lat: Księga jubileuszowa Wydziału Mechanicznego Energetyki i Lotnictwa Politechniki Warszawskiej*. Warszawa: Wydział Mechaniczny Energetyki i Lotnictwa.

2. Antoniewski, T., Banaszek, J., Frączek, W., \_Wolański, P. (2018) . *Szkoła inżynierii lotniczej i kosmicznej*. Warszawa: Wydział Mechaniczny Energetyki i Lotnictwa.