

Erasmus Policy Statement (EPS)

Institute of Fluid-Flow Machinery PAS (IMP PAN) joins fundamental and applied research in the field of mechanical engineering. Currently research is conducted in the fields of: fluid mechanics, multiphase flows, thermodynamics, heat exchange, plasma physics, laser technique, mechanics of machines, diagnostic/structural health monitoring, application of smart materials. Beside fundamental research Institute offers research and support in realisation of practical problems related to Polish and European market. Due to this fact Institute perform work related to development, design, calculation and constructions of specific structures/stands.

Currently research is conducted in the cooperation with industry and in the frame of national (NCN, NCBiR, POiR) and international research projects (H2020: RIA, FET OPEN, Twinning; EU COST; ERA-NET; Marie Curie Fellowships MSCA-ITN, FP7 People ITN), that includes international cooperation and scientific exchanges. Institute cooperate with the EU countries as well as countries outside the EU like e.g. China: Fraunhofer Institutes (IFAM, LBF in Germany), Goethe University in Frankfurt, Universität des Saarlandes in Saarbrücken, CNRS, Process and Engineering in Mechanics and Materials Laboratory (Paris, France), Ecole Nationale Supérieure d'Arts et Métiers ENSAM (Paris, France), University of Bologna (Italy), University of Naples Federico II UNINA (Italy), Kaunas University of Technology (Kowno, Litwa), Hohai University (Nanjing, China), Nanjing University of Aeronautics and Astronautics (Nanjing, China), Hong Kong Polytechnic University, Department of Mechanical Engineering.

IMP PAN cooperates in the field of education with many international research/education institutions and industry in whole world. IMP PAN researchers conduct invited lectures (lecture series) and lectures during the visits abroad in research units in Europe and Asia. Institute allowed students and PhD students from Germany(Dresden) and China (Hohai) to conduct the experimental research in IMP PAN during the visits (travel and accommodation was paid by the institution sending students or from projects).

Mobility of researchers from IMP PAN was realised in the Marie Curie projects, short visits in the frame of H2020 projects, in the NAWA exchange projects and in the frame of COST action.

IMP has long-time experience in the education process of PhD students. Currently IMP PAN leads Doctoral School (Studium Doktoranckie) related to mechanical engineering, which is at the stage of closing due to new polish educational regulations. Currently IMP PAN is also leader of second Doctoral School (Trójmiejskiej Szkoły Doktorskiej TSD PAN). Education is realised in the fields of mechanical engineering, civil engineering, transportation and environmental sciences. TSD PAN was created in 2019 under the educational act 2.0. Lectures are conducted in polish and English languages. It should be underlined that due to wide international cooperation IMP PAN has international research staff and PhD students from different countries (not only from EU). IMP PAN is beneficiary of stipends for PhD students in the frame of NCN projects and in the edition of "Implementation PhD" ("doktorat wdrożeniowy").

Research and education led in IMP PAN fits in the European Education Area:

1. Key competences:

- Numerical, scientific and engineering skills - (numerical analysis of fluid-flows/multiphase flows, statics and dynamics of structures, development of solutions for microturbines, cogeneration energy sources)
- Digital and technology-based competences- CAD/CAE/CAM software application, programming in Matlab, C++ and Python

2. Digital skills Action 10 - Artificial Intelligence and analytics – deep learning and machine learning for diagnostic/Structural Health Monitoring problems.

Participation in the Erasmus+ program allows to support the growth the TSD PAN (widening the education offer for PhD students, increase students mobility, increase qualification of educational personnel – lecturers and supervisors).

It fits key competences listed in polish and European frameworks. One of the IMP PAN goals is the flexibility of education programs and its fitting to changing work market. Widening education offer is based on the lectures conducted by international scientist and industrial staff. It is planned to utilised the digital educational tools. Currently all lectures in IMP PAN are leaded in the remote form.

Participation in the program allows the growth of the mobility (short and long time visits allowing to conduct research related to PhD topics) and possibility to realise the part of lectures abroad. IMP PAN will hosts with the pleasure the international students and will allow to conduct research and to participate in lectures of visiting persons. IMP PAN will prepare to implementation quality systems related to education and will implement ECTS system in the frame of TSD PAN.

Increased mobility of staff could be divided to:

- i) increase the experience in management of TSD PAN, development of specialise educational program and leading the lectures
- ii) possibility to conduct research in the frame of cooperation.

IMP PAN will host with pleasure research persons from universities or industry which will conduct lectures.

In order to make more attractive education offer IMP PAN will improve/extends infrastructure (including the laboratories in Gdansk and in KEZO (Jablonna) division)based on own funds and sources in the form of projects. Participation in ERASMUS+ program will allow to create new cooperation with universities and industry which will allow to share the IMP PAN research infrastructure and validated results. Such research will be conducted by persons from IMP PAN and this will allows to learn and extend the competences of such persons.

Participation in the Erasmus+ program allows to support and growth the international cooperation strategy, which is currently based on:

- research in cooperation based international projects (H2020, ERA-NET Martec) – research collaboration, scientific visits, exchange of experiences and methods, results promotion
- promotion of results achieved by researchers and PhD students
- cultural cultivation and propagation

Participation in the program allows the growth of the mobility, the educational offer and increase the new competences of researchers due to mobility and improvement of international cooperation.