

Strategy for the Development of the Faculty of Materials Engineering and Physics

The Faculty of Materials Engineering and Physics is a new faculty at the Cracow University of Technology, although it was established from units that already have a rich history and have made a significant contribution to the teaching and scientific achievements of our University. The first years of operation of the new faculty will determine its future development directions, the scientific position of its staff and, above all, its teaching position in the fields of Materials Engineering and Physical Sciences. The scientific position of our Faculty will have a significant impact on the scientific position of the Cracow University of Technology and its recognition both in Poland and abroad.

The development of the Faculty of Materials Engineering and Physics should be based on four pillars:

1. conducting high-level scientific research in the field of materials engineering and physics, while ensuring the development of technological and research facilities,
2. providing high-level education for qualified engineering staff for innovative industry and modern scientific and research facilities in the region and the country,
3. scientific cooperation with leading scientific institutions in the country and abroad,
4. cooperation with the socio-economic environment.

Within the scientific discipline of Materials Engineering, several thematic teams have been established, focusing on the following research areas:

1. Inorganic polymers and zeolites,
2. Organic polymers,
3. Powder metallurgy,
4. Biomaterials,
5. Organic optoelectronics, nanolayers and nanocoatings.

Other emerging areas of interest are also noticeable, which may contribute to the formation of new research groups in the near future, developing:

1. 3D printing of metals,
2. Welding and heat treatment,
3. Optical methods in surface engineering,
4. 3D printing with organic polymers.

Considering the clearly defined objectives in addressing research challenges, it should be natural to group staff around leaders, who should ideally be independent researchers, although this is not an absolute requirement. Currently, the Faculty of Materials Engineering and Physics already has young employees whose scientific achievements have contributed to obtaining elite LIDER research projects financed by the National Centre for Research and Development. Such projects broaden the competence of young scientists in independent planning, management, and leadership of their own research teams during the implementation of scientific projects, the result of which can be implemented in the economy.

Each research area should operate and develop on the basis of grants obtained. Grants should serve as the source of funding for the purchase of research equipment, consumables, scientific conferences, and publications. To ensure consistency in the development of the represented scientific discipline, which is Materials Engineering, it is essential that Research Team Leaders present to the Discipline Council the scope and plan of research, the plan for obtaining grants, the plan for purchasing research equipment, and the publication plan. This process will enable the Discipline Council to effectively support objective actions

towards achieving the intended goal, which is for our Faculty to obtain Category “A” in the new scientific evaluation, considering the updated assessment rules.

Within the Faculty, the Department of Physics includes many outstanding theoretical scientists who are not subject to evaluation. Their significant scientific potential must contribute to improving the assessment of evaluated disciplines at the University in the future. It is essential to introduce greater transparency in the accounting of the activities undertaken by Research Team Leaders, with particular emphasis on the individual development of employees in individual research teams. A regular schedule of scientific seminars will be introduced, during which progress in the implementation of the plans will be assessed.

The requirements associated with the continuous development of the scientific discipline cannot be met without involving young academic staff, on whom the future of the Faculty depends. To this end, special attention should be paid to the selection of topics for engineering and master's theses. The most talented students should be involved in scientific work carried out in the faculty units. Research topics initiated as part of engineering theses should be continued during second-cycle studies and as part of master's theses. A student achieving significant publication output may lead to the award of a Diamond Grant. The research topics of diploma theses may be subsequently be continued within doctoral theses.

The topics of proposed doctoral theses should be formulated taking into account the Faculty's development plan in order to ensure the balanced development of all research teams. This approach will enable the proper development of academic staff and the opportunity to recruit new, talented researchers for these teams.

In order to ensure reliable implementation of the development plan, the Departments of Materials Engineering and Physics, as well as research team leaders will submit proposals for doctoral thesis topics to the Discipline Council for review. Project budgets should include scholarships for doctoral students. The possibility of obtaining an additional scholarship, apart from the scholarship from the Doctoral School, may be an important factor in deciding to take further steps to commence doctoral studies for some second-cycle graduates.

A very important aspect in the proper functioning of any academic unit is the correct and transparent distribution of subsidies allocated to the Faculty. I propose that the subsidy be distributed taking into account current needs, such as:

1. Equipment for lecture halls and teaching laboratories, including the purchase of modern multimedia resources, software for simulating physical phenomena and technological processes, trainers and simulators for technological processes, and equipment necessary for the teaching process, which will enable education both in the traditional way and with the use of virtual reality
2. Training and courses to improve teaching skills, focusing primarily on modern and effective methods of knowledge transfer.
3. Training courses to improve the qualifications of administrative and technical staff.
4. Small grants for so-called non-independent academic staff.
5. Financing publications that cannot be financed from grants but significantly impact the improvement of the parametric value of the evaluated scientific discipline.
6. Awards for publications and patents.

Proper management involves both setting realistic requirements and delegating appropriate powers to department heads. Among other things, decisions on the expenditure of subsidies allocated to individual departments should be made by department heads, who are also responsible for budgetary discipline in their departments. At this stage of the Faculty's development, fragmentation of capital and distribution of financial resources is unacceptable. The distribution of funds allocated to the Faculty will take into account the long-term interests of the Faculty, i.e. all its staff and students.

The current organizational structure of the Faculty consists of two departments: the Department of Physics and the Department of Materials Engineering. I do not intend to change this structure in the near future. Any changes in the number of departments will be possible after strengthening the departments' staffing levels, which in turn is closely linked to two aspects – an increase in the number of students studying at the Faculty of Materials Engineering and Physics, and a significant increase in the number of teaching and research grants obtained and implemented in the departments. The increase in the number of students studying at the Faculty will allow for the stabilization and subsequent strengthening of the position of teaching staff and an increase in the number of both teaching and research-teaching staff, while the increase in the number of grants will allow for a partial reduction in the teaching workload of research-teaching staff and a significant boost to their publishing activity. Grants are also an excellent opportunity to assess the aptitude of doctoral students for academic work, as they are likely to become future research and teaching staff at the Faculty of Materials Science and Physics.

Students are our common good. A well-educated graduate, sought after on the labour market by modern and innovative industries, is the best showcase for the Faculty. In addition to well-prepared advertising campaigns, it is the opinions of students and graduates that will shape future recruitment to the Faculty of Materials Engineering and Physics. Support and assistance in solving student problems at all levels of study must be taken on in a very intensive manner by student group supervisors. Talented students should be involved in the work of science clubs, and the results of this work should be presented at seminars in departments, science club sessions or scientific conferences. In all important aspects of student life, the Faculty management will work closely with the student council.

The Faculty implements the policy of the Cracow University of Technology in the field of HR Excellence in Research and OTM-R (Open, Transparent and Merit-Based Recruitment), ensuring open, transparent and competence-based principles of recruitment and development of academic staff. The Faculty's activities are focused on supporting the mobility and career development of researchers, promoting open science and the internationalization of research. The Faculty monitors the implementation of these principles, in line with the guidelines of the European Commission and the University's strategy.