

TRAINING PROGRAM IN DISCIPLINE: Chemical Sciences

1. Basic information

Domain: Natural Sciences

Discipline: Chemical Sciences

Degree awarded: PhD in Chemical Sciences

2. Training demand

The Faculty of Chemistry of the Lodz University of Technology is the only one in the central part of Poland to educate doctors of science and natural sciences in the discipline of chemical science, in 1. chemistry or 2. chemical technology, having engineering background. The studies shall prepare the candidate for work in research units, research and development units, universities - especially technical universities - by gradually introducing the candidate to research work using the latest achievements and results of scientific work in the field of doctoral studies chosen by the candidate. After obtaining doctorate, the graduates have not only extensive knowledge of chemistry and chemical technology, but also the ability to pose, analyze and propose solutions to problems and their synthetic description. These features allow them to adapt flexibly to work in areas not only related to chemistry.

3. Detailed entry requirements

Graduates from master courses of the following faculties are accepted for studies: chemistry, chemical technology, chemical engineering, material engineering, physics and related fields (e. g. biochemistry, biophysics), not necessarily completed at polytechnic faculties. In addition, the candidate should demonstrate the ability to work independently, to acquire and apply knowledge in a variety of fields, and to demonstrate aptitude for objective analysis and evaluation of the observations made and collected results of the tests.

4. Teaching methods

Lectures, tutorials, laboratories, projects, seminars, e-learning

5. Graduate's profile

The training prepares graduates to work in research and development units and universities, especially technical universities. The graduate has extensive and in-depth knowledge of concepts, principles and theories in the field of chemistry and chemical technology, with particular emphasis on the areas related to the prepared thesis, which was gained under the supervision of lecturers, including those from renowned foreign centres. The graduate is prepared to work with the use of modern research techniques, knows the mechanisms for raising funds for scientific research and implementation work from both domestic and international sources, and is prepared to work independently or in a group -

including international ones. Advanced design and laboratory works prepare young scientists for tasks related to creating their own research teams, managing R&D departments in enterprises, creating consortia developing new technologies, developing products, processes and services - as well as creating independent entities such as Spin off/out or Start-ups. They can also modify, assess and consult on new technological and product developments in terms of their efficiency, cost-effectiveness and innovativeness - including in the broader context of a sustainable and low-carbon circular economy. Graduates are able to conduct didactic classes at the first and second level of studies, they are also able to conduct scientific research in accordance with the rules of ethics in science and technology. Graduates understand the need for continuous learning and maintaining the ethos of research community.

The specialists in these areas are also awaited by industries and institutions related to advanced materials, technology of production and processing. It is primarily the chemical industry in its broadest sense, but also, among others, the agro-food industry, pharmaceuticals, construction chemicals, transport and automotive industry. Based on the experience of innovation leader economies, it can be said with confidence that doctorate holders in chemical sciences are not only talented scientists, but also the most valuable and creative individuals - as middle and senior management both in industry and business. This group also creates breakthrough material solutions and technologies in leading research and development centres. An important sector of employment are also institutions of state and local government administration as well as NGOs, seeking these graduates for their tasks of expert, opinion-forming, supervisory, ensuring the safety of the environment, production processes, work, products, etc.

6. Training plan

First year (Semester 1 and 2)		
No.	Subcategory	Subject
1	E	Entrepreneurship
2	CC1	Advanced Inorganic Chemistry
3	CC2	Advanced Organic Chemistry
4	CC3	Advanced Physical Chemistry
Second year (Semester 3 and 4)		
No.	Subcategory	Subject
1	CC4	Advanced Molecular and Macromolecular Science