# Chemical and environmental engineering

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| **Faculty** | Faculty of Materials Science and Technology |
| **Type of study** | Doctoral |
| **Language of instruction** | English |
| **Code of the programme** | P0712D130003 |
| **Regular period of the study** | 4 years |
| **Coordinating department** | Department of Chemistry and Physico-Chemical Processes |
| **Coordinator** | prof. Ing. Marek Večeř, Ph.D. |
| **Keywords** | Chemical Technologies, Technologies for Environmental Protection, Chemical Industry |

## About study programme

The graduates of the doctoral study program Chemical and Environmental Engineering have an extraordinary forward-looking self-assertion, which results from the wide applicability of the acquired knowledge with a wide range of scope.

## Graduate's employment

Doctoral program graduates can be employed as science, development or pedagogical staff at universities, research institutes and research institutions. Other possible sectors are state administration and manufacturing companies, particularly chemical, pharmaceutical, food, energy, oil and gas industries, and the operations of environmentally friendly processes.

## Study aims

The doctoral study program Chemical and Environmental Engineering is based on the current doctoral study program Process Engineering accredited at FMT VŠB-TUO. The study program is follow-up to homonymous Master's study degree program at FMT, which is offered in three specializations: "Methods of Analysis for Chemical and Environmental Engineering", "Chemical Engineering" and "Environmental Engineering".
The doctoral study program Chemical and Environmental Engineering is focused on educating students for self-reliant creative research work in the field of chemical and process engineering in both theoretical and experimental research using advanced research techniques. Program educated graduates who have complex knowledge from the field applicable for management, design and optimization of chemical production and environmental technologies as well as scientific methods of research and development applicable in studies of mass, momentum and energy transport processes, chemical kinetics and equilibrium in multiphase systems.
In both full-time and combined form of study, students will be individually guided and educated according to the approved themes of doctoral theses under supervision of supervisor.
The aim of the doctoral study is to provide the Ph.D. student with the extended knowledge gained in the studied field, the development of talent for creative work and the development of scientific or engineering personality.

## Graduate's knowledge

Students of the doctoral study program Chemical and Environmental Engineering will acquire theoretical knowledge from the field and will be skilled in the methods of research and experimental work related to the specific topic of the dissertation. Theoretical knowledge will be gained within the scope of appropriately chosen courses, which cover basic subjects such as mathematics, physical chemistry, organic chemistry, analytical chemistry, process engineering, transport phenomena and selected special processes aimed at the elimination of pollution in waste gases, atmosphere and waters and the use of waste - environmental catalysis and photocatalysis including preparation and characterization of materials suitable for these processes, reactor engineering, multiphase hydrodynamics, air protection and waste treatment technologies.

## Graduate's skills

Graduates are able to design and use advanced research techniques in the field in order to extend the knowledge of the field by providing basic research - to develop and evaluate theories, concepts and methods of the field, including the defining the fields or their categorization in a wider area. The emphasis regarding the professional skills of students of the doctoral study program Chemical and Environmental Engineering is focused on the development of creative thinking, especially in interpretation of measured results, studying current state of knowledge in the given field and the ability to present obtained results to the professional community. Students are encouraged to actively participate in professional national and international conferences.

## Graduate's general competence

Graduate of the doctoral study Chemical and Environmental Engineering is able to independently formulate a scientific problem, propose a hypothesis to solve the problem and perform experimental or theoretical attempts to confirm it. The ability to critically evaluate published scientific information and the ability to express in writing and orally in English belongs to an integral part of the basic knowledge of the graduates. The knowledge of the graduates exceeding the theoretical fundamentals of the field varies according to the type of the project that graduates solve during the doctoral study.

## Hard skills

- Material and energy balances
- The process of sharing heat and mass
- Separation processes
- Transport of fluids
- Waste management

## Study curriculum

- form Full-time (en)