

## Objective of the Bachelor's Degree Program in Chemical Engineering and Professional Competencies

### Program Objective:

The aim of the program is to train chemical engineers who are capable of operating and maintaining chemical industry processes and equipment, implementing and applying chemical technologies, organizing and managing work, and performing tasks of average complexity in technical development, research, and design. They are also prepared to ensure the safe and health-conscious operation of technological systems, recognize potential impacts on human health, and apply appropriate preventive measures. Graduates are prepared to continue their studies in master's programs.

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### Professional Competencies of the Chemical Engineer

#### a) Knowledge

- Understands the mathematical and scientific (chemical and physical) foundations of processes used in the chemical industry and related sectors.
- Knows the most commonly used materials in the chemical industry, their production principles, and conditions of application.
- Understands the basic principles of chemical and industrial processes, as well as design and control technologies.
- Knows the operating principles, structural units, and design basics of equipment and instruments used in chemical technologies and laboratories.
- Understands the measurement and analytical methods, tools, and instruments used in chemical processes and their conditions of applicability.
- Is familiar with safety, health protection, and environmental requirements related to the field.
- Has basic knowledge of economic, management, environmental, quality assurance (QC/QA), IT, intellectual property protection, and legal regulations and procedures closely related to chemical technologies.
- Understands the methods of knowledge acquisition and data collection in chemical engineering, including their ethical limitations.

#### b) Skills

- Able to apply analytical and design principles and methods related to chemical processes and technologies.
- Capable of interpreting and characterizing the structure and operation of chemical and industrial systems, including the design and interconnection of system components.
- Applies technical and safety regulations for the safe operation of chemical and industrial systems, including principles of equipment setup, operation, and economic considerations.
- Able to manage and supervise chemical production and other technological processes, considering quality assurance and control aspects.
- Diagnoses failures and technological problems and selects appropriate corrective actions.
- Understands and uses technical documentation and literature relevant to the field in Hungarian and at least one foreign language.
- Capable of learning and introducing new processes, products, and systems, recognizing their health-related mechanisms.
- Performs laboratory, pilot-scale, and industrial-level measurements, evaluates results, and contributes to development tasks.

- Able to carry out basic-level leadership tasks in chemical engineering.
- Interprets and utilizes health-related information and applies modern management knowledge and skills to create a workplace environment that supports health and efficiency.

#### c) Attitude

- Strives for continuous self-education in chemical engineering aligned with professional goals.
- Open and receptive to applying new, modern, and innovative environmentally conscious technologies and management methods.
- Considers sustainability in all aspects of work, especially when introducing new technological processes and procedures.
- Seeks to learn and apply best practices, new professional knowledge, and methods in the field.
- Maintains a quality-oriented mindset and applies modern quality assurance procedures in all tasks.
- Aims to solve tasks and make leadership decisions in cooperation with colleagues, considering their input.
- Applies safety, health, and environmental protection principles when planning and performing technological and laboratory tasks.

#### d) Autonomy and Responsibility

- Performs professional tasks independently under the guidance of a workplace supervisor, complying with quality and safety requirements.
- Initiates the development and implementation of new professional solutions when needed or possible.
- Directs the work of assigned personnel and supervises the operation of technological equipment and measuring instruments under the guidance of a workplace supervisor.
- Regularly evaluates the efficiency, effectiveness, and safety of subordinates' work and assigns further tasks based on the evaluation.
- Monitors and evaluates the professional development of subordinates, encourages and supports their efforts.
- Shares experiences with colleagues to support their development.
- Makes decisions or proposes evaluations, recognition, or promotion of colleagues within their scope of authority.
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