

BURGAS STATE UNIVERSITY
“PROF. DR. ASSEN ZLATAROV”

I APPROVE!

RECTOR:.....

/Prof. Sotir Sotirov, PhD/



QUALIFICATION SPECIFICATION

of the specialist with professional qualification:
"CHEMICAL ENGINEER"

Field of Higher Education: **5. TECHNICAL SCIENCES**

Professional Field: **5.10. CHEMICAL TECHNOLOGIES**

Educational and Qualification Degree: **"BACHELOR"**

Specialty: **"CHEMICAL ENGINEERING"**

Professional Qualification: **"CHEMICAL ENGINEER"**

National Qualifications Framework (NQF) Level: **Level 6, Sub-level 6B**

BURGAS, 2026

OBJECTIVES OF THE SPECIALITY

The objective of education in the "Chemical Engineering" major is to train highly qualified chemical engineers with in-depth theoretical and practical knowledge in technical sciences, backed by a fundamental, broad-profile general engineering foundation. Specialists in "Chemical Engineering" holding a "Bachelor's" degree and the professional qualification of "Chemical Engineer" possess training that enables them to pursue careers as engineering personnel within research, manufacturing-technological, design-engineering, and organizational-managerial units of the chemical, petroleum, food, pharmaceutical, and other industries related to the physical-chemical and biochemical processing of substances, including the resolution of environmental engineering problems.

PURPOSE OF THE SPECIALITY

The educational program in "Chemical Engineering" has been developed by the habilitated teaching staff in accordance with the requirements and regulations of: the Higher Education Act, the Ordinance on State Educational Requirements for Acquiring Higher Education for the Educational and Qualification Degrees of "Bachelor", "Master", and "Specialist", the Regulations on the Structure and Activity of the Burgas State University "Prof. Dr. A. Zlatarov", and the Regulations on the Educational Activities of the University. It has been discussed and adopted by the Department Council, the Faculty Council at the Faculty of Technical Sciences, and the Academic Council at Burgas State University "Prof. Dr. Assen Zlatarov". The major "Chemical Engineering" builds upon the classical knowledge of secondary education graduates and the widespread application of modern information technologies, ensuring the mobility and adaptability of graduating Bachelors - "Chemical Engineers". Training in the major includes: a solid fundamental general education and a broad, interdisciplinary professional preparation - lecture courses in fundamental and specialized disciplines conducted according to modern curricula; practical training - practical laboratory sessions in modernly equipped laboratories with opportunities to participate in real scientific projects and research, as well as industrial internships, student mobility programs, and experience exchange at foreign universities. Students enrolled in the "Chemical Engineering" major must possess a good fundamental, general engineering, and broad-profile specialized preparation and competence in the field of the specialty. The fundamental preparation must include targeted knowledge in the following disciplines: Higher

Mathematics, Physics, Chemistry, Information Technology, Thermodynamics, Fundamentals of Chemical Technology, Mathematical Modeling and Optimization, Modern Methods of Analysis, Technical Safety and Industrial Management, Ecology and Environmental Protection. The general engineering preparation must include knowledge in: Engineering Graphics, Mechanics, Machine Elements, Electrical Engineering and Electronics, and Production Automation. The specialized preparation must include knowledge in: Fluid Hydromechanics, Fundamentals of Heat and Mass Transfer, Applied Software in Chemical Engineering, Technological Dimensioning and Design of Heat and Mass Transfer Equipment, Reaction and Refrigeration Engineering, Computer-Aided Design (CAD) of Units and Installations in Chemical Enterprises, and Analysis and Synthesis of Chemical-Technological Systems.

FORM AND DURATION OF STUDY

The forms of study are full-time and part-time, with a duration of 8 (eight) semesters, 4 (four) years, and 240 credits.

ADMISSION REQUIREMENTS

For training towards acquiring the Educational and Qualification Degree of "Bachelor" in the "Chemical Engineering" major, individuals who have completed secondary education that grants them access to higher education institutions are admitted. Admission is conducted in accordance with the Higher Education Act, the Regulations on the Structure and Activity of the University, and the Regulations on Educational Activities. It is based on the grade from the State Matriculation Examination (Matura) in Bulgarian Language and Literature, Chemistry, or Mathematics. Applicants may also apply using grades from Olympiads and National competitions.

GRADUATION REQUIREMENTS

Training for students in the Educational and Qualification Degree of "Bachelor" in the "Chemical Engineering" major concludes with the passing of a State Exam in the specialty or the defense of a Graduation Thesis (Diploma Thesis).

KNOWLEDGE, SKILLS AND COMPETENCIES

The Bachelor's program in "Chemical Engineering" provides the following knowledge, skills, and professional competencies:

A. Knowledge of:

- Interdisciplinary knowledge and competencies to influence chemical-technological and manufacturing processes;
- Technological schemes and parameters of primary chemical industries;
- The design of relevant manufacturing operations;
- Analyzing and proposing solutions to problems, as well as setting and achieving goals;
- Performing critical analysis and developing new ideas in the field of chemical engineering;
- Optimization of chemical process systems;
- The management of future and existing industrial facilities.

B. Skills for:

- Independently interpreting the acquired knowledge in the specialty;
- Solving complex engineering and technological problems;
- Setting and achieving goals, and motivating continuous learning;
- Defining innovative solutions by combining different strategies and technologies;
- Identifying problems within the investigated scientific field;
- Organizing, managing, and successfully executing activities within the scope of the specialty;
- Operating new technical equipment;
- Developing new and diverse skills in response to newly emerging knowledge and practices;
- Assuming responsibility and making independent decisions in specific environments.

C. Professional Competencies:

- Ability to acquire and apply new knowledge using appropriate learning strategies;
- Strong foundation in physics, mathematics, general chemistry, general engineering, and broad-profile specialized training;
- Knowledge of the fundamental theoretical principles of fluid dynamics, heat and mass transfer, and chemical processes, alongside methods for their quantitative description for equipment design and control purposes;

- Knowledge of the structural features of chemical process equipment, skills in performing engineering analysis on the operating modes of individual apparatuses, process units, and plants, and the ability to propose solutions to improve their efficiency;
- Analyzing and interpreting data using engineering judgment;
- Ability to work with process, technical, and engineering documentation;
- Ability to use and practically apply various computer systems and software tools for the design of process equipment and installations, as well as production control and automation systems;
- Competencies regarding occupational safety and environmental protection requirements;
- Core knowledge for application in production management processes, as well as for leading production teams.

CAREER OPPORTUNITIES AND FURTHER QUALIFICATION

Graduates of the "Chemical Engineering" Bachelor's program with the professional qualification of "Chemical Engineer" receive the necessary scientific foundation and interdisciplinary technical training to pursue careers in the following areas:

- As higher-education specialists in academic, research, and teaching fields;
- Across all branches of the chemical, petroleum refining, polymer, biotechnological, and related industries;
- As specialists in the planning, design, and implementation of chemical processes, as well as in the development of innovative technical, process, and managerial solutions;
- In production and technology units, organizational and management divisions, and specialized analytical and control laboratories;
- In consulting and engineering design firms;
- In independent engineering practice, working as experts, consultants for industrial enterprises, or in patent activities, including solving environmental engineering problems.

Upon completing the "Bachelor's" degree, graduates can continue their education in a "Master's" program within Professional Field 5.10 "Chemical Technologies".

The Qualification Specification was adopted on:

Adopted by the Faculty Council (FC) of the Faculty of Technical Sciences (FTS), Protocol No. /

Adopted by the Academic Council (AC), Protocol No. 33 / May 18, 2017

Updates to the Qualification Specification:

FC of FTS, Minutes No. 42 / 09.07.2026

AC, Minutes No. 64 / 23.07.2026

Updates to the Qualification Specification:

FC of FTS, Minutes No. /

AC, Minutes No. /