



The Minimal Elements of Qualifications Standards

1. BASIC CHARACTERISTICS

1.1 Name(s): Generic + Subject Specific

Food Technology Engineer

1.2 Minimal Volume

180 ECTS

1.3 Level

6

1.4 Entry Routes

Completed four-year secondary education

2. COMPETENCIES / LEARNING OUTCOMES

2.1 Competencies at the level of qualification

- Planning, organising and supervising* the work in food processing plants
- Planning and organizing the work in the food analysis laboratories
- Working in scientific-research institutes
- Planning and controlling raw materials and readymade products

*Supervision in food processing plants relates to small-scale industrial plants.

2.1 Learning Outcomes

(Organised in Units and other groups/modules, where Units have additional information, e.g. ECTS)

Unit 1. Fundamental disciplines, minimum 50 ECTS

- Solving the tasks and problems in mathematical areas of computing operations, algebra, differential equations, probability and statistics (including experiment modelling and practical designing);
- Knowing and interpreting the basic physical phenomena and laws in the field of mechanics, electricity and magnetism, atomic physics and quantum mechanics;
- Demonstrating the knowledge in the field of general, inorganic, physical and analytical chemistry;
- Describing and explaining the functioning of cells and their organelles, along with an ability to discuss genetic patterns and genetic research trends;

- Presenting and explaining biochemical processes along with practical realization of the basic biochemical laboratory testing;
- Effective utilization of standard IT equipment, commercially available software for general purpose and a limited number of specific program packages;
- Intermediate level in a foreign language proficiency (speaking, reading and writing);
- Preparing and delivering written and oral-visual presentations.

Unit 2. Food chemistry and analysis, including nutrition basics, *minimum 15 ECTS*

- Demonstrating the sampling and implementation of basic laboratory and instrumental methods in food analysis according to established protocols;
- Explaining chemisms and mechanisms of chemical, biochemical and physical transformations of food ingredients in the production thereof;
- Explaining and describing functional and nutritive properties of the most important ingredients of food products;
- Describing physical properties of food and explaining the causes and processes behind their different levels of expression;
- Classifying and functionally describing the most important groups of food additives.

Unit 3. Microbiology and food safety, *minimum 10 ECTS*

- Demonstrating knowledge in the field of general and industrial microbiology and conducting isolation and identification of microbiological cultures of importance for food technologies and microbiological spoilage of food;
- Designing a program of maintaining adequate hygienic conditions in a pilot and in a genuine food industry plant;
- Describing and making functional distinctions between the GMP and GHP elements;
- Designing the elements of a HACCP plan of a pilot and a genuine food processing plant;
- Explaining the causes and effects of the most common types of food poisoning.

Unit 4. Environment protection, *minimum 5 ECTS*

- Categorising air water and soil pollution originating from food processing industry;
- Making functional identification and describing the most common pollutants from food processing industry;
- Designing basic environment protection and waste management systems on diverse models of food processing plants;

Unit 5. Food engineering and technology, *minimum 50 ECTS*

- Stating and making value characteristics of technological parameters of quality of the major raw materials in food processing industry;
- Explaining and presenting in diagram flows the most important transformation processes in food production;
- Presenting the structures and the main elements of the process equipment and control in different food processing plants and demonstrating practically the measurements, recording, processing and interpreting of data obtained through measurements;
- Classifying, making functional distinctions between and presenting the technologies and techniques of food conservation and protection (including: cooling, freezing, thermal processing, dehydrating, airing and chemical protection);
- Explaining the purpose of food product packaging, elements of labelling and interaction of the packaging material and food;
- Modelling the storage conditions for different groups of food products;
- Computing, solving the problems of, and simulating and modelling in the process engineering domains;
- Designing conceptual models of food industry plants with necessary energy and installation environments;

Unit 6. Economics and management, *minimum 5 ECTS*

- Explaining, computing and interpreting microeconomic indicators in food processing industry;
- Developing calculations of costs related to manufacturing of more relevant food products;
- Modelling food processing industry management systems by using organisational charts and flow diagrams;
- Explaining and demonstrating the understanding of food products market mechanisms and factors, along with practical realization of a volume-limited market research.

Unit 7. Professional practise and student's project (final paper/project), *minimum 10 ECTS*

- Demonstrating knowledge in the organization, production and technological flow in concrete production environment; the professional practice may be realized in other system environments as well (laboratories, institutions, catering facilities, etc.) and following the practical work students should demonstrate knowledge in the work organization and system functioning areas.
- Demonstrating the ability to define research problem, to select and properly use literature sources, to consistently present research methods, to adequately process and interpret research results and to make consistent conclusions, including carrying out written and oral/visual presentation of projects.

3. RELEVANCE

3.1 Labour market

- *Food processing industry*
- *Food and beverage quality control institutions*
- *Education and health care institutions*
- *Scientific research institutes*
- *Administration authorities*
- *Catering and tourism sector*
- *Non-governmental organizations*

3.2 Further education / progression

- *Continuation of education at the next cycle of study of food technology and related studies*

3.3 Other needs

4. QUALITY ASSURANCE

4.1 Working Group members who took part in the document development process

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Union for Rural Development BiH	Slavko Inić, President
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MPSV RS	Brankica Tomas
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Additional instructions:

- Learning outcomes presented in the document are based on recommendations provided by the International Union of Food Science and Technology (IUFoST) for the food technology study programme.