



Universität für Bodenkultur Wien

BOKU University, Vienna

Curriculum

for the Master Programme in

Food Science and Technology

Programme classification no. 066 417

Effective date: October 1st, 2025

For legal purposes, only the version of the curriculum that has been published in the official journal (Mitteilungsblatt) is binding and valid - this English translation is for information purposes only.

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Curriculum of the Master Degree Programme

“Food Science and Technology”

At the University of Natural Resources and Life Sciences, Vienna

As at October 1st, 2025

§ 1 QUALIFICATION PROFILE

The Master programme in Food Science is a degree programme which serves to deepen and extend students' pre-vocational academic education, building on the basis provided by a Bachelor degree programme (§ 51 [2] item 5 of the Universities Act UG 2002, Federal Law Gazette BGBl I no. 81/2009). The programme fulfils the requirements of Directive 2005/36/EC on the recognition of professional qualifications, article 11, letter e.

The focal points of an academic education in the area of Food Science and Technology are the research of plant-, animal- and microbiologically-related raw materials and their processing into food, as well as using biological and engineering principles and methods to produce foodstuffs. In addition, particular attention is paid to the quality of the production processes as well as the produced food, especially from an ethical, ecological, hygienic and nutritional physiology-related point of view. A central component is the constant interaction between research and teaching.

To the same extent, equivalent importance is also given to adequate personality development, as part of which guidance in independent, critical and logical thinking and planning, formulation and reasoning of arguments, the ability to work abstractly, the ability to communicate and work within a team, as well as acting ethically responsibly, are promoted.

Graduates should also be able to comprehend the continual changes in scientific advances and to realistically assess their own skills, strengths and weaknesses.

The specific educational aim of the Master degree in Food Science and Technology is the combination of sciences (biology, chemistry, physics, mathematics) and process technology at a high scientific level.

In addition, the curriculum also allows students to become competent in the areas of economics and management. International relations are promoted through numerous exchange programmes, international co-operation and foreign language modules.

An industrial work placement of one month duration supports the vocational education.

Within the degree programme, it is also possible to attain the additional qualification “quality manager – junior” of the TÜV (Technical Inspection Authority) Austria.

1a) Knowledge and Personal and Professional Skills

Knowledge:

Graduates of the Master degree programme Food Science and Technology possess highly specialised, theoretical and practical knowledge in order to analyze and evaluate various complex problems in the context of food and its production from a natural scientific and theoretical basis. This knowledge can be communicated on a national and international level and thereby ties in with latest findings in the field of expertise.

This knowledge serves as foundation for originality when it comes to the development and / or use of ideas and solutions for problems. Graduates demonstrate a critical awareness for issues in the field of expertise and act at the interface between engineering, economy and society.

Skills:

Graduates are enabled to establish a solid diagnosis of problems based on research by integrating knowledge taken from various areas (mainly natural sciences, social sciences, management sciences) and gaining new insights from these as well as developing new processes and methods.

Furthermore they are in the position to react to recently established knowledge and techniques in their field of expertise by developing new skills in an interdisciplinary way and use them in order to communicate these. They are in the position to estimate and evaluate risks at the production and distribution of existing as well as of new products.

Personal and Professional Competence:

Graduates can work independently in their field of expertise within the scope of food sciences and food technology. They are enabled to solve problems that consist of many interrelated factors. They are equipped with leadership skills and the ability for innovation in complex and unpredictable situations.

They are able to lead national and international teams and examine their achievements. Graduates are in the position to communicate state-of-the-art results, methods and underlying principles within their own area of expertise to a professional and general audience.

Graduates can solve problems by integrating complex and probably incomplete sources of knowledge into new and unfamiliar contexts. They demonstrate a good understanding of learning processes and self-directed learning. They can respond to social, scientific and ethical questions of food sciences and food technologies and are enabled to offer new, strategic approaches and their own contributions to expert knowledge and professional experience within a complex and quickly changing work and learning environment.

Graduates also possess the following minimal skills, knowledge and competences (minimal learning outcomes) apart from the requirements stated.

FOOD SCIENCE

Graduates are equipped with a broad knowledge on composition, structure, functions, impacts and interrelations of food components and auxiliary substances.

They understand and master methods of how food and its raw materials are characterized, evaluated, composed and on how their authenticity is determined. They can plan, carry out and evaluate extensive microbiological, (bio-) chemical, physical, sensory and molecular biological analyses. They are enabled to understand the connections between food, nutrition and health and can evaluate the complex interactions of produced food, consumers and the environment.

Graduates know the various spoilage mechanisms of food as well as the intrinsic and extrinsic factors as far as shelf life and safety are concerned. They are in the position to experimentally prove appearances of pathogenic organisms and deterioration germs. Furthermore, they can find their causes and define preventive measures. They are also

enabled to bring in their professional expertise on products and raw materials for the principles of modern quality management.

FOOD TECHNOLOGY

Graduates know and understand technologies and processes for the production of the most important foods and understand the related (micro-) biological, (bio) chemical and physical processes as well as the effects of various manufacturing processes on product characteristics. They can apply the principles of various conservation methods for diverse foods taking their limitations, advantages and disadvantages into account.

They understand the fundamental concepts of mass transportation and heat transmissions for the most important basic operations and can calculate mass and energy balances.

They know the principles of process engineering and have knowledge of plant components and instrumentation as well as their accurate hygienic layout. They understand current good codes of practice for production and for the maintenance and cleaning of sites as well as management of waste products. As far as packaging technology is concerned they understand the common techniques and know the qualities of common materials used.

MANAGEMENT AND LAW

Graduates understand the principles of quality management in the food industry and in test laboratories and know the extent of necessary documentation as well as its use. They are enabled to implement good codes of practice in laboratories and production in the field of food industries as well as the food analyses. They know the most important control mechanisms.

They know the various aspects of quality and on the basis of consumer requirements and the technical framework they can design respective products and carry out risk analyses for food safety. They can use these abilities for prevention as well as operationally, for example with the help of HACCP-concepts.

They can apply and critically evaluate statistic methods for the validity of methods, for the comparison of methods, variance component analyses, statistical design of experiments and multivariate relations.

They possess practice-oriented knowledge in the field of food legislation and can solve legal questions in cooperation with specialist lawyers.

PERSONAL SKILLS

Graduates can individually plan and evaluate experiments, organize their realization and compose reports and summary presentations. This is done taking scientific criteria and current electronic systems into account. These skills dealing with electronic systems are beyond average.

They are enabled to communicate scientific topics orally and in writing in the English language and can lead discussions on a professional, scientific and international level.

They have experience in team work, when it comes to cooperation as well as leadership for projects and meetings, for critically evaluating their own achievements as well as that of others and have professional time management skills.

1b) Professional Qualifications

The employment opportunities are very diverse, from occupations in scientific research and development, in planning and the application of processes and facilities, to the production and control of foodstuffs. Opportunities for specialisation exist in the following fields of employment:

- food production
- process and product design
- quality management
- food safety
- food controls
- food analysis
- product management
- research and teaching
- consulting

§ 2 ADMISSION REQUIREMENTS

Graduates of the Bachelor programme in Food Science and Biotechnology offered by BOKU University of Natural Resources and Life Sciences are eligible for admission with no further requirements.

Graduates of other Bachelor programmes must be able to show basic knowledge in the fields of chemistry, biology / biochemistry / microbiology / genetics, process engineering, mathematics / statistics / physics, management and law as well as in the fields of basic food sciences and food technology.

For graduates of Bachelor programmes completed at other universities, mastery of the following learning outcomes is required for admission:

CHEMISTRY

The candidates know the basics of general and qualitative analytical chemistry and know the most important rules of conduct, safety measurements and the safety equipment in laboratories. They understand the principles of chemical thermodynamics, reaction kinetics and electro chemistry. They can do calculations in these fields. Furthermore, they possess basic knowledge of electrochemical, spectroscopic and chromatographic methods. In addition, the candidates have a general understanding of biochemical reactions. They have knowledge on physical structure and nomenclature of organic molecules and analytical methods for the identification of structures.

BIOLOGY/ BIOCHEMISTRY/ MICROBIOLOGY/ GENETICS

Candidates possess a general understanding of cellular biological and genetic principles and processes and have acquired microscopy techniques. They know about cellular structures of prokaryotic and eukaryotic cells as well as the life cycles of viruses. They have a command of general microbiological work methods and possess knowledge in the field of fermentation

technologies and the refurbishment of fermentative products. This also includes an understanding of growth kinetics of microorganisms.

In the field of molecular biology the candidates possess a general understanding of molecular biological principles and processes and have acquired basic molecular biological work methods (cloning, sequence analysis, polymerase chain reaction (PCR), genetic sequence analysis with the help of Southern Blot Analysis).

The candidates know of the basics of biochemistry, know the most important technics in biochemical laboratories and can also practically apply this knowledge.

In the field of hygiene, the candidates know the most important definitions and foundations as well as the areas of epidemiology, medical assessment, immunology and the importance and specialties of pathogen germs, parasites and toxic agencies as well as the basics of HACCP concepts in connection with food.

PROCESS ENGINEERING /FOOD TECHNOLOGY

Candidates possess fundamental knowledge on technical drawing, can understand and read technical plans as well as production drawings. They are in the position to realize basic technical constructions mentally and have a general knowledge in the field of technical mechanic. Candidates understand the first and second law of thermodynamics. In the field of measurement and control technology they know the most important tools for data collection and are familiar with measuring quantities such as temperature, humidity, pressure. In the field of process engineering they know traditional processes such as filtration and centrifugation, rectification and extraction, but also modern methods such as supercritical extraction or membrane procedures. In the field of food technology they understand the basics and interrelations of food processing (basic operations and general processes) and especially know about methods for cooking, preparation and shelf-life extension.

MATHEMATICS/ STATISTICS/ PHYSICS

Candidates have an active understanding of fundamental mathematical concepts and methods such as data adaptation for functions, linearization, power series, and applications in chemical kinetics as well as in process engineering, graphic tests with the help of logarithmical scales, integral calculus and differential equations.

They can independently analyze data material using statics software and assess results critically.

In the field of physics, they know the basics of mechanics, thermodynamics, and electricity and are therefore in the position to solve basic physical exercises.

MANAGEMENT AND LAW

Candidates understand the philosophy, strategies and methods of quality management and are in the position to apply essential tools of quality management. They know the most important statistic procedures in order to describe and compare data and to estimate measurement inaccuracies. They have a sound insight into current national and international standards of food quality and safety and, as a consequence of that, their practical development and implementation.

The candidates possess a basic knowledge in the field of business administration and the foundations for the conceptualization, application and controlling of such projects.

PERSONAL SKILLS

Candidates are able to communicate in English orally as well as in writing.

They are above average when it comes to working with current computer systems, especially word processing, table handling and presentation programmes.

Furthermore, competences in English at a level of B2 (according to the Common European Framework of Reference for Languages by the Council of Europe) are recommended.

§ 3 PROGRAMME STRUCTURE

3a) Duration, Total ECTS Credits and Structure

The programme consists of courses and other requirements worth a total of 120 ECTS credits. This is equivalent to a duration of four semesters (a total of 3000 60-minute credit hours). The programme is divided into

Compulsory courses:	59 ECTS credits, including
Compulsory internship:	3 ECTS credits
Master's Thesis:	30 ECTS credits
Elective courses:	16 ECTS credits

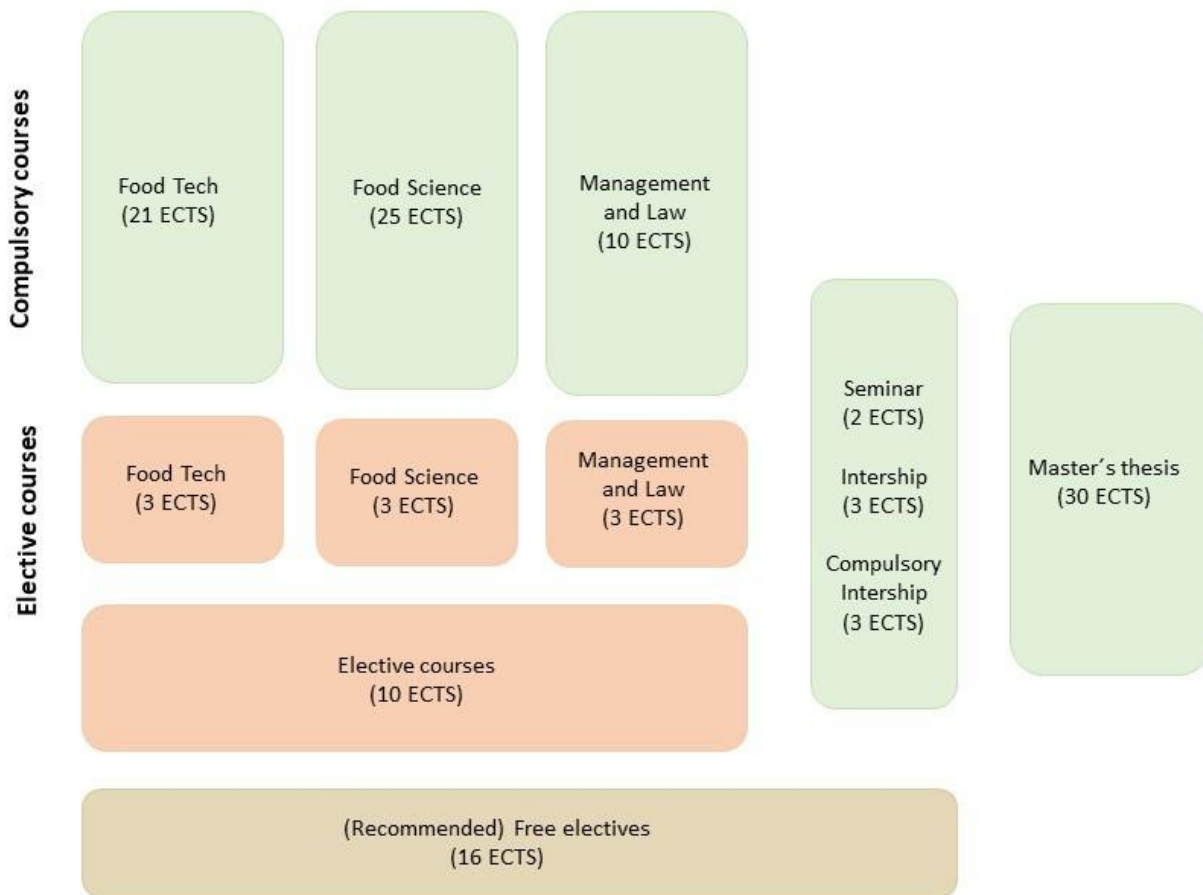
Free electives:

Foreign language- taught courses*):	11 ECTS credits
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*) Re Foreign language-taught courses:

Students are required to complete courses, which are related to the field of study, worth a total of 11 ECTS credits taught in a foreign language. These courses can be compulsory courses, elective courses or free electives. Courses taken at international universities abroad are to be credited. General language courses (with the exception of specialised language courses) will not be considered. (General foreign language courses may be credited in the framework of free elective courses.) A total of 11 ECTS credits worth of courses taught in English must be offered in the list of compulsory and elective courses included in this curriculum.

Basic Structure



3b) Three-Pillar Principle

The three-pillar principle is one of the central identifying characteristics of both the Bachelor and Master programmes offered at the University of Natural Resources and Life Sciences, Vienna. In the Master programmes, the sum of the compulsory and elective courses must be made up of at least

- 15% technology and engineering
- 15% natural sciences
- 15% economic and social sciences, law

The Master's Thesis, compulsory internship and free electives are excluded from the three-pillar rule.

3c) Limited Number of Participants in Courses

For courses with a limited number of participants the head of the Master course is authorized to first admit students enrolled in the Master programme (that means that students enrolled in a Bachelor study programme can only be admitted to the courses if further spaces are left on the course!) The admission of students enrolled in the Master study programme is conducted according to the following order of required courses by the students: compulsory course, elective course, free elective course.

§ 4 COMPULSORY COURSES

Used Abbreviations:

ECTS = European Credit Transfer System

WS = Winter Semester

SS = Summer Semester

Notes:

- 1) In English
- 2) In English and German
- 3) Courses not offered in the academic year 2024/25
- 4) Courses only offered in uneven years (e.g. 2021/22, 2023/2024)
- 5) Courses only offered in even years (e.g. 2022/23, 2024/2025)

The following compulsory courses are required to complete the Master programme:

Food Sciences	Course Type	ECTS Credits
Course Title		
Food chemistry	VO	5.0
Food chemistry practical course	UE	4.0
Food microbiology	VO	4.0
Practical training in food microbiology	UE	3.0
Human nutrition ¹	VO	3.0
Food physics	VU	2.0
Food toxicology ¹	VO	2.0
Sensory evaluation of food	VU	2.0
Food Technology	Course Type	ECTS Credits
Course Title		
Food processing technology	VO	3.0
Food ingredient functionality	VO	3.0
Practical course in food technology ¹	UE	5.0
Food biotechnology ¹	VO	5.0
Food packaging technology ²	VU	3.0
Mechanical and thermal process technology II ^{1,3}	VO	2.0
Management and Law	Course Type	ECTS Credits
Course Title		
Applied quality management	VS	3.0
Applied quality management exercises *)	UE	5.0
Food law	VO	2.0

Compulsory Internship Seminar	Course Type	ECTS Credits
Course Title		
Compulsory internship seminar ²	SE	3.0

**) Prerequisites for participation: for students enrolled from the winter semester 2012 onwards the following requirements apply: 755301 (Food chemistry practical course), 754304 (Practical training in food microbiology), 752321 (Food processing technology), 752322 (Food ingredient functionality).*

§ 5 ELECTIVE COURSES

Elective courses worth a total of no fewer than 15 ECTS credits are required to complete the Master programme.

Courses to an extent of at least 3 ECTS have to be chosen from each of the elective units (I, II, III, V) and to an extent of at least 2 ECTS of the elective unit IV.

Elective Unit I - Food Sciences	Course Type	ECTS Credits
Course Title		
Industrial hygienics ³	UE	2.0
Psychology of nutrition	VO	2.0
New product development	VU	2.0
Authenticity of foods	VO	3.0
Food authenticity practical course ¹	UE	3.0
Aroma of foods	VO	2.0
Fat chemistry and technology ¹	VO	2.0
Specific and emerging topics in food microbiology ¹	SE	3.0
Milk analysis	UE	2.0
Large-scale catering and communal feeding	VO	2.0
Elective Unit II - Food Technology	Course Type	ECTS Credits
Course Title		
Cereal technology	VO	2.0
Brewery technology	VO	2.0
Fruit and vegetable processing technology	VO	2.0
Refrigeration and air-conditioning ¹	VO	3.0
Applied measurement and control systems ¹	VU	3.0
Processes in enzyme technology ¹	VO	2.0

Biochemical reaction engineering ¹	VO	2.0
Dairy technology	VO	2.0
Technology of drinks	VO	2.0
Enzyme engineering ¹	VU	2.0
Technology of chocolate and confectionary	VO	2.0
Technology of sugar	VO	2.0
Automatic identification technology in food industry ¹	VU	3.0
Energy engineering ¹	VO	3.0
Elective Unit III – Management and Law	Course Type	ECTS Credits
Course Title		
Food supply chain management	VO	3.0
Open innovation strategies ¹	VS	3.0
Food safety and risk management ¹	VS	3.0
Total quality management in dietetics	VS	3.0
Elective Unit IV – Seminars	Course Type	ECTS Credits
Course Title		
Seminar in food technology ¹	SE	2.0
Seminar on food science	SE	2.0
Enzyme technology seminar ¹	SE	2.0
Elective Unit V – Practical Courses	Course Type	ECTS Credits
Course Title		
Practical course in dairy technology	PR	3.0
Practical course in measurement systems and applied programming ¹	PR	3.0
Practical course in energy engineering ¹	PR	3.0
Practical course in enzyme technology ¹	PR	3.0

§ 6 FREE ELECTIVES

Free electives worth a total of 16 ECTS credits are required to complete the Master programme. Free electives may be selected from all courses offered by all recognized universities in Austria and abroad. Free electives are intended to impart knowledge and skills in the student's own academic subject as well as in fields of general interest.

§ 7 COMPULSORY INTERNSHIP

(1) The compulsory internship is intended to help students improve the skills learned in their degree programme. It is also intended to encourage students to learn to apply what they have learned in practice, and recognize relationships between theory and practice.

(2) The compulsory internship shall be at least 4 weeks in duration. It is recommended to complete the internship between the second and third semesters of the degree programme. Students may also split the internship into more than one part.

(3) The compulsory internship seminar provides students with a thematic review of the internship experience.

(4) Planning the procedural steps to be taken is the responsibility of the Academic Programme Committee for the relevant programme. Suggested procedure: The student must contact the instructor of the internship seminar in a timely manner before the start of his/her internship to arrange supervision. The instructor shall consult with the student and advise him/her on the choice of an internship placement and the necessary procedures and reporting requirements. The approval of the instructor is required if the student wishes to split the internship into more than one part.

(5) If no internship placement pursuant to (1) can be organized in spite of a genuine effort on the part of the student, a substitute must be selected in agreement with the instructor of the internship seminar. Possible substitutes include e.g. participation in a research project at BOKU or another research institution in a relevant field.

(6) Completion of the internship seminar is confirmation of the completion of the compulsory internship or the substitute activity.

§ 8 MASTER'S THESIS

A Master's Thesis is a paper on a scientific topic, to be written as part of a Master degree programme (for exceptions please see the By Laws of the University of Natural Resources and Life Sciences, Vienna, § 86[9]). The thesis is worth a total of 30 ECTS credits. With their Master's Thesis, students demonstrate their ability to independently address a scientific topic, both thematically and methodologically (§ 51 [8] UG 2002 BGBl. I no. 81/2009).

The topic of a Master's Thesis shall be chosen in such a way that it is reasonable to expect a student to be able to complete it within six months. Multiple students may jointly address a topic, provided that the performance of individual students can be assessed (§ 81 [2] UG 2002 BGBl. I no. 81/2009).

The Master's Thesis shall be written in German or English. Languages other than German or English are permissible only if approved and confirmed by the thesis supervisor. The thesis defence must be held in German or English regardless of the language of the thesis.

§ 9 COMPLETION OF THE MASTER PROGRAMME

The Master programme in Food Science and Technology has been completed when the student has passed all required courses and received a positive grade on the Master's Thesis and defence examination.

§ 10 ACADEMIC DEGREE

Graduates of the Master programme in Food Science and Technology are awarded the academic title Diplom-Ingenieur (m) or Diplom-Ingenieurin (f), abbreviated as Dipl.-Ing./Dipl.-Ing.ⁱⁿ or DI/DIⁱⁿ.

The academic title Dipl.-Ing./Dipl.Ing.ⁱⁿ or DI/DIⁱⁿ, if used, shall precede the bearer's name (§ 88 [2] UG 2002 BGBl. I no. 81/2009).

§ 11 EXAMINATION REGULATIONS

(1) The Master programme in Food Science and Technology has been completed successfully when the following requirements (corresponds to components in [7] below) have been met:

- The successful completion of the compulsory courses worth 59 ECTS credits (§ 4),
- the successful completion of the elective courses worth 15 ECTS credits (§ 5),
- the successful completion of the free elective courses worth 16 ECTS credits (§ 6),
- and the positive assessment of the Master's Thesis and the defence

(2) Student evaluation takes the form of course and module examinations. Course examinations can be either written or oral, as determined by the course instructor, taking the ECTS credit value of the course into account. Any prerequisites for admission to examinations shall be listed in § 4 under the respective course/module.

(3) The choice of examination method shall be based on the type of course: Lectures shall conclude with a written or oral examination, if continuous assessment of student performance is not applied. Seminars and project-based courses can be evaluated based on independently written papers, length and contents of which are determined by the course instructor. For all other course types, the examination type is at the instructor's discretion.

(4) The topic of the Master's Thesis shall be selected from one of the subjects of the Master programme. The student must inform the dean in writing prior to the commencement of the work on the Master's Thesis. Thereby, the student has to state the Master's Thesis topic as well as the name of the supervisor of the Master's Thesis.

(5) The completed Master's Thesis which has been assessed positively by the supervisor shall be publicly presented by the student and defended in the form of an academic discussion (defence examination). The committee shall consist of a committee chair and two additional university lecturers with a *venia docendi* or equivalent qualification. The student's total performance (thesis and defence examination) will be assigned a comprehensive grade. Both thesis and defence examination must receive a passing grade for the student to complete the programme. The written evaluations stating the grounds for the thesis grade and the defence examination grade are included in calculating the comprehensive grade and are documented separately.

The comprehensive grade is calculated as follows:

- Master’s Thesis: 70%
- Defence examination (incl. presentation): 30%

(6) A comprehensive evaluation of the student’s performance on the entire programme shall be assigned. A comprehensive evaluation of “passed” means that each individual component of the programme was completed successfully. If individual components of the programme have not been successfully completed, the comprehensive evaluation is “failed”. A comprehensive evaluation of “passed with honours” is granted if the student has received no grade worse than a 2 (good) on all individual components, and if at least 50% of the individual components were graded with 1 (excellent).

§ 12 TRANSITIONAL PROVISIONS

Students who have not completed the formerly effective Master’s curriculum in Food Science and Food Technology (H 417) when this new Master’s curriculum comes into force are transferred to the currently valid one.

For students in the new Master’s curriculum already positively completed exams on courses from the old Master’s curriculum are acknowledged based on the equivalence list for the respective study programme.

§ 13 EFFECTIVE DATE

This curriculum shall take effect on October 1st, 2025.

ANNEX A TYPES OF COURSES

The following types of courses are available:

Lecture (VO)

Lectures are courses in which certain areas of a subject and the methods used in this area are imparted through didactic presentation.

Lab Course (UE)

Lab courses are courses in which students are instructed in specific practical skills, based on theoretical knowledge.

Practical Course (PR)

Practical courses are classes in which students deal with specific topics independently, based on previously acquired theoretical and practical knowledge.

Compulsory Internship Seminar (PP)

The compulsory internship seminar is a class in which students deal independently with topics related to their internship placements, based on previously acquired theoretical and practical knowledge.

Seminar (SE)

Seminars are courses in which students are required to work independently on the respective subject, deepen their knowledge of the topic and discuss relevant issues.

Field Trips (EX)

Field trips are courses in which students have the opportunity to experience relevant fields of study in real-life practical application, to deepen their knowledge of the respective subject. Field trips can be taken to destinations both in Austria and abroad.

Master's Thesis Seminar (MA)

Master's Thesis seminars are seminars intended to provide students with academic support during the thesis writing process.

Project Course (PJ)

Project courses are characterized by problem-based learning. Under instruction, students work (preferably in small groups) on case studies, applying appropriate scientific methods.

Mixed-Type Courses:

Mixed-type courses combine the characteristics of the courses named above (with the exception of project-type courses). Integration of different course-type elements improved the didactic value of these courses.

Lecture /Seminar (VS)

Lecture/Lab (VU)

Lecture/Field Trip (VX)

Seminar/Field Trip (SX)

Lab/Seminar (US)

Lab/Field Trip (UX)