DETAILED PROPOSAL OF THE STUDY PROGRAMME

1. GENERAL INFORMATION ON THE STUDY PROGRAMME			
1.1. Name of the study programme	Graduate university study programme Nutrition		
1.2. Provider of the study programme	University of Zagreb, Faculty of Food Technology and Biotechnology		
1.3. Partner institutions			
1.4. Type of study programme	Vocational study programme ☐		University study programme ☒
1.5. Level of study programme	Undergraduate ☐	Graduate ☒	Integrated ☐
1.6. Manner of implementation of the study programme	Classical ☐	Mixed (classical + online) ☒	Online in entirety ☐
1.6.1. Is it a?	☒single major ☐double major ☐interdisciplinary study ☐multidisciplinary study ☐developing programme		
1.7. Academic/vocational title earned at completion of the study	Master of Science in Nutrition (mag. nutr.)		
1.8. Scientific/artistic field/area of the proposed study programme	Biotechnical sciences, nutrition		

2. INTRODUCTION		
2.1. Reasons for starting the study programme	Scientific need	Cultivating professionals who will transfer their expertise to the economy through scientific, applied and development research, which will incorporate their own critical thinking and creativity in order to create new knowledge and ideas. Nutrition science is a rapidly evolving discipline and represents an area of exceptional potential for creating new knowledge with a distinct characteristic of practical and economic application.
	Cultural need	Creating experts who will use their knowledge, work, and commitment to continuously contribute to the education of the general population with the aim of raising awareness of the importance of health and proper nutrition and adopting a healthier lifestyle; participate in public health actions in order to improve the quality of life and prevent chronic non-communicable diseases and nurture traditional dietary patterns.
	Social need	Due to the increasing global popularity of nutrition, there is a need for experts who will

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		educate the general public and other specific populations and promote the basic principles of nutrition science, adhering to social responsibility and the rules and values of the profession. In addition, students who obtain a graduate degree in nutrition participate in the development of specialized meal plans and menus in a number of hospitals, schools, kindergartens and military academies in the Republic of Croatia.
	Economic need	The vision of the Faculty is to play an important role in the sustainable development of science and technology, economy, and society as a whole. Thus, it is important to educate experts with competencies to work in the health system and various fields of industry, contributing to the quality and diversity of the economic system, development of new products and technologies with practical knowledge to apply them, all the while fostering a culture of quality in organization and management systems.
2.2. Assessment of the study programme's usefulness relative to the demands of the labour market in the public and private sectors	The importance of monitoring food trends and applying synergistic knowledge in economic activities affects the labour market demand for nutritionists. The graduate study of nutrition enables the further development of acquired competencies and the acquisition of additional knowledge and skills, which produces experts who can easily adapt to the needs of the public and private sector. Following the development of the profession and the needs of the economy, employers, and the community, there has been an increase in the need for masters of nutrition, which is confirmed by data from the Croatian Employment Service on adequate employability of masters by observing the profession of a nutritionist and non-specific occupations in the economic subsector.	
2.3. Compatibility of the study programme with the University mission and the strategy of the proposer, as well as with the Higher Education Institutions Network strategic plan	In order to ensure and improve the quality of the graduate study of nutrition, a significant step has been made in the progress and design of the quality system. The study programme is in line with the mission and vision of the Faculty as it produces experts, masters of nutrition, whose education is based on scientific, basic, applied, and developmental research. The programme is based on the latest scientific advances in basic and applied disciplines in the field of nutrition. International competitiveness and a sustainable education system for masters of nutrition that will meet the needs of the labour market and be a driver of social and economic growth and development are being actively developed. These activities are in line with the University's strategies to develop nationally and strategically important study programmes needed by the society and the economy. They are also compatible with the Network of Higher Education Institutions and Study Programmes related to teacher workload, teacher-student ratio, percentage of lectures held by in-house teaching staff, labour market needs, interest in the field of study, occupancy of the institution, implementation of programmes in cooperation with other institutions, the ratio of the number of students who are enrolled and those who graduate from the undergraduate study programme Nutrition.	
2.4. Comparability of the study programme with other accredited programmes in higher education institutions in the Republic of	Comparing the study programme with the programmes of other accredited higher education institutions, it can be concluded that there are particularities in teaching at biotechnological institutions. The advantage of the curriculum of	

Croatia and the EU (name at least two programmes, one of which is from an EU country, and compare them with the proposed programme; provide internet addresses of the programmes)	the Faculty of Food Technology and Biotechnology is that the undergraduate study of nutrition includes courses from various fields of science, such as food technology, biochemistry, food microbiology, basics of diet therapy, nutrition for specific populations, basics of food toxicology, physiology and others. In this way, the students gain broad knowledge in the field before enrolling in the graduate study of nutrition, where their further progress is based on complementing and broadening the acquired knowledge and skills in addition to acquiring new ones. In contrast to the abovementioned programme design, undergraduate programmes of higher education institutions outside the Republic of Croatia provide more general knowledge and skills. Based on this, students decide which direction to take in order to continue developing professionally and then acquire specific knowledge at the graduate study level. Despite the differences in the design of study programmes, students of the Faculty of Food Technology and Biotechnology acquire the same professional knowledge and competencies as students of accredited universities inside and outside the Republic of Croatia, which can be confirmed by comparing programmes and courses. Upon completion of accredited graduate study programmes listed as an example, the same number of ECTS credits is collected, studies have the same duration (4 semesters) or shorter (3 semesters), and differences exist in the organization of programmes and courses within these programmes. Examples of accredited graduate study programmes: Faculty of Food Technology, Josip Juraj Strossmayer University of Osijek http://www.ptfos.unios.hr/images/dokumenti/studiji/diplomski/30d_izvedbeni-19-20_diplomski-zohin_hr.pdf Biotechnical Faculty, the University of Ljubljana http://www.bf.uni-lj.si/dekanat/studijski-programi/2-bolonjska-stopnja-magistrski-studiji/prehrana/predmetnik/#c8577 Faculty of Bioscience engineering, Ghent University https://studiegids.ugent.be/2020/EN/FACULTY/I/MABA/IMFOTE/IMFOTE.html In addition, due to the extensive knowledge acquired in the undergraduate study of nutrition, the students can easily participate in graduate studies as part of student exchange, which demonstrates the compatibility of knowledge they acquire with other studies and high quality of programmes at the Faculty of Food Technology and Biotechnology.
2.5. Openness of the study to student mobility (horizontal, vertical in the Republic of Croatia and international)	Horizontal and vertical mobility of students is regulated by the Decision on the manner of implementation of student mobility procedures and the Ordinance on undergraduate and graduate studies at the University of Zagreb, which can be accessed on the Faculty's website. When choosing elective courses, students may enrol in other courses at the same level that are taught at FFTB, but also other components of UNIZG, for which the procedure is stipulated and it includes the head of a study programme

	and vice dean for education. In this way, the students are encouraged to be open in terms of broadening the achieved learning outcomes but in line with the learning outcomes of the programme. In addition to graduate studies, great attention is paid to postgraduate (doctoral) university studies and postgraduate specialist studies, which produce specialised experts and set a high level of specific learning outcomes and acquired skills and competencies. Experts who have completed the graduate study in nutrition and want to progress in the same direction have the opportunity to continue their professional development towards the educational vertical at the postgraduate university study of nutrition. The enrolment quota in the aforementioned study of nutrition is adjusted to the interest of experts for further education and does not create a restriction for enrolment into the desired study programme. In addition, when choosing the field of postgraduate university or specialist study, horizontal mobility is taken into account, which enables the expansion of professional knowledge and areas of professional activity. The International Relations Office and the Committee continuously perform functions and activities that enable graduate students the international mobility through bilateral cooperation and European mobility networks, such as Erasmus+ and CEEPUS. Upon completing the graduate study, masters of nutrition compete for places in postgraduate doctoral studies outside the Republic of Croatia.
2.6. Relationship with the local community (economy, entrepreneurship, civil society, etc.)	The food industry is the most important economic branch in the Republic of Croatia in which masters of nutrition have the possibility of employment. The Faculty has an active Economic Council, which additionally enables connection with stakeholders, including businessmen. The connection with the local community is visible through events and collaborations with many associations, such as the Croatian Society of Food Technologists, Biotechnologists and Nutritionists, CeliVita Association, Association SVE za NJU, Croatian Association of Nutritionists, Croatian Academic Center for Applied Nutritional Science, Rare Diseases Croatia and others.
2.7. Compatibility with the requirements of professional associations, if any exist	Despite there not being any specific requirements of professional associations, the activities of a master of nutrition are focused on the values promoted by the Croatian Society of Food Technologists, Biotechnologists and Nutritionists (HDPBN), the Croatian Society of Nutritionists and Dietitians (HDND), the Croatian Association of Nutritionists and Croatian Academic Center for Applied Nutritional Science (HACPN). A professional council, which would unite food technologists, biotechnologists and nutritionists, is in the process of being established, with employees of the Faculty participating in the preparation of documents for its foundation, and there are currently no other such professional associations in the Republic of Croatia.
2.8. Name possible partners outside the higher education system	The graduate study of nutrition is associated with the Clinical Hospital Center Zagreb, the University Clinic Vuk Vrhovac, the Institute for Medical Research and Occupational Medicine, the School of Public Health "Andrija Štampar", the food company Podravka d.d. and the Children's Hospital Zagreb.
2.9. Other (as the proposer wishes to add)	/

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3. GENERAL INFORMATION	
3.1. Duration of the study programme (is there an option of distance learning, part-time studying, etc.)	The graduate university study of nutrition lasts 2 academic years, i.e. 4 semesters. The programme cannot be studied part-time and by distance learning in its entirety. The descriptions of individual courses state what percentage of teaching can take place through e-learning.
3.2. The minimum number of ECTS credits required for completion of study	120 ECTS
3.3. Enrolment requirements and admission procedure	The prerequisite for enrolment into the graduate study of nutrition is the completed undergraduate study of nutrition or some of the other undergraduate studies at the Faculty of Food Technology and Biotechnology or related studies, in which case it is mandatory to pass the bridging exams. Enrolment into the graduate study of nutrition is done through a notice of competition published on the official website of the Faculty. All students registered for enrolment in the graduate study of nutrition enter the classification procedure. Passing the entrance exam with a passing grade is mandatory for candidates who have completed an undergraduate professional study. Based on the results of the classification procedure, ranking lists are generated, and students who enter the enrolment quota of studies are enrolled into the graduate study of nutrition.
3.4. Language of the study programme	Croatian
3.5. Learning outcomes of the study programme relative to legislative acts, requirements of applicable professional associations, demands of the labour market, possibilities for continuation of education and general social needs (name 15-20 learning outcomes)	1. Synthesize general and specific knowledge and skills from basic, applied sciences and profession in the field of nutrition and dietetics. 2. Manage dietary systems in public and private institutions for targeted population groups. 3. Recommend appropriate methods in individual dietary quality assessment systems. 4. Recommend appropriate methods in systems for the nutritional status assessment of population groups. 5. Design a diet therapy for various diseases and conditions based on obtained data on nutritional and health status. 6. Recommend whole foods and dietary patterns based on their components and impact on human health. 7. Design a diet plan according to specific nutritional needs of both healthy and ill persons. 8. Design foodstuffs (functional foods) based on market analysis and data collected. 9. Choose and evaluate scientific and professional literature for the purpose of lifelong learning and professional growth. 10. Apply scientific research methods in the field of nutrition for the purpose of writing professional or scientific papers. 11. Present and promote work results independently and/or as a part of a homogeneous or interdisciplinary professional team, in written and oral form using professional terminology. 12. Independently and/or within a professional team create legislation related to the specific requirements of the profession. 13. Apply standards and ethical principles related to the specific requirements of the profession.

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3.6. Evaluation of student employability at completion of the study programme, including opinions or official documents from three organizations associated with the labour market (e.g. professional associations or scientific institutions, employers or their associations, unions, public services, etc.) on the suitability of the anticipated learning outcomes to the demands of the labour market	The food company Podravka d.d. confirmed that the masters of nutrition are professionally trained and that they acquire the basic knowledge to work in various spheres of the food industry. The Ministry of Agriculture of the Republic of Croatia confirmed that the masters of nutrition are professionally trained, acquire basic knowledge to work in areas within the scope of the Ministry and that their expertise and knowledge contribute to improving food safety and quality policies. The Faculty of Tourism Management and Hospitality confirmed that the masters of nutrition are qualified to work in the education sector, where they demonstrate a high level of professional knowledge, ability to think critically, solve problems, as well as high independence and motivation to work. The University Hospital Centre in Zagreb confirmed that the masters of nutrition acquire basic knowledge provided by the study programme and that they are professionally trained to work as dietitians in health care institutions. (employers' statements are attached)
3.7. Possibilities of continuing studies at a higher level	The Faculty of Food Technology and Biotechnology provides the possibility of enrolling into a university postgraduate (doctoral) study and a postgraduate specialist study.
3.8. Upon submitting proposals for graduate study programmes, name undergraduate studies of the proposer or other institutions in the Republic of Croatia that qualify for admission to the proposed graduate study	Faculty of Food Technology and Biotechnology, University of Zagreb: Nutrition, Food Technology, Biotechnology Faculty of Food Technology Osijek, Josip Juraj Strossmayer University of Osijek: Food Technology Faculty of Science, University of Split: Nutrition Department of Biotechnology, University of Rijeka: Biotechnology and Drug Research

4. DESCRIPTION OF THE STUDY PROGRAMME	
4.1. List of mandatory and elective courses and/or modules with class hours and ECTS credits (appendix: Table 1)	
4.2. Description of each course (appendix: Table 2)	
4.3. Structure of the study (number of semesters, trimesters, class sizes for lectures and exercises/seminars)	The duration of the graduate study of nutrition is 4 semesters. The size of a group for lectures is 150 students, for seminars 30, and for exercises 10 students.
4.4. Enrolment requirements for the following semester or trimester	Courses are enrolled by students each semester without prerequisites except for the course Enteral and parenteral nutrition where the prerequisite is successful completion of the course Diet Therapy
4.5. List of courses and/or modules offered in a foreign language (which language)	Courses that can be taught in English are: Food Epidemiology; Diet Therapy; Basics of Measurement Methods in Nutrition; Interaction of Essential and Toxic Elements; Probiotics and Starter Cultures; Food Additives; Gut Microflora, Nutrition and Health; Biologically Active Compounds in Food and the Mechanism of Action; Shelf Life of Packaged Foodstuffs; Modified Fats and Oils; Novel Food; Nutrigenomics; Dietary Management of Diabetes; Geriatric Nutrition; Biochemical Function of Vitamins and Ions; Sensory and Chemometric Evaluation of Wine; Food, Nutrition and Health; Enteral and Parenteral Nutrition

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4.6. Completion of the study:			
a. Final requirement for completion of the study	Final thesis ☐	Diploma thesis ☒	Final exam ☐	Diploma exam ☐
b. Requirements for application of final/diploma thesis and/or final/diploma exam	The student chooses the topic of the diploma thesis in the third semester of the second year of graduate study. The student chooses the topic of the thesis in agreement with the mentor (supervisor) or expresses a desire to write the diploma thesis in a particular field or at another institution. For the preparation of the diploma thesis outside the FFTB, the Diploma Thesis Committee refers the student, in agreement with the mentor, to the preparation of the diploma thesis at another institution.		
c. Evaluation procedure for final/diploma exam and evaluation and defence procedure for final/diploma thesis	The diploma thesis is evaluated by the members of the expert committee, confirmed by the Diploma Theses Committee, which consists of an odd number of members (three), with an obligatory indication of their replacements. The mentor cannot be the president of the committee for the evaluation and defence of the diploma thesis. The graduate can defend the diploma thesis when all members of the expert committee have positively assessed the diploma thesis by using the form "the thesis is accepted". All exams in the graduate study programme: Nutrition must be successfully passed as a precondition for the defence of the diploma thesis. The graduate study ends with the passing of all the exams and the completion of all other study requirements, the preparation of the diploma thesis and the public defence of the diploma thesis in accordance with the study programme. Completion of the study programme is regulated by the Ordinance on studying at the undergraduate and graduate studies of the University of Zagreb and the Ordinance on the preparation of diploma thesis and defending the thesis for students studying according to the Bologna system.		

Table 2 Course description

In a separate document.

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Table 3 List of required and elective courses and modules with class hours and ECTS credits

LIST OF COURSES/MODULES									
Year of study: 1									
Semester: I									
MODULE	COURSE	COURSE TEACHER	From n to x semester	L	S	E	e-learning	ECTS	Required/ elective
	Nutritional epidemiology	Selma Cvijetić Avdagić	1.	20	30	0	5 %	4	Required
	Consumer, food and nutrition	Irena Colić Barić	1.	15	30	20	5 %	5	Required
	Food Toxicology	Ivana Kmetič	1.	30	15	30	5 %	6	Required
	Nutritional Assessment	Irena Colić Barić	1.	20	0	45	0 %	5	Required
	Immunology for Nutritionists	Lidija Šver	1.	15	15	0	5 %	3	Required
	Elective courses A		1.-3.					7	Elective
Year of study: 1									
Semester: II									
MODULE	COURSE	COURSE TEACHER	From n to x semester	L	S	E	e-learning	ECTS	Required/ elective
	Diet therapy	Darija Vranešić Bender	2.	37	42	8	15 %	7	Required
	Toxicological Aspects of Food Processing	Teuta Murati	2.	20	15	0	5 %	3	Required
	Methodology of scientific research and intelectual property protection	Ivana Kmetič	2.	10	6	9	5 %	2	Required

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	Diatery Management of Diabetes	Dario Rahelić	2.	20	20	32	10 %	5	Required
	Biochemical role of vitamins and ions	Vladimir Mrša	2.	30	0	0	15 %	4	Required
	Elective courses A		1.-3.					9	Elective
Year of study: 2									
Semester: III									
MODULE	COURSE	COURSE TEACHER	From n to x semester	L	S	E	e-learning	ECTS	Required/ elective
	Managament	Marijo Ćaćić	3.	30	30	0		4	Required
	Education and Communication Skills in Nutrition Science	Irena Colić Barić	3.	30	0	30	5 %	5	Required
	Pediatric Nutrition and Dietetics	Ivana Rumbak	3.	20	20	12	5 %	5	Required
	Elective courses A		1.-3.					10	Elective
	Elective courses B		3.-4.					5	Elective
Year of study: 2									
Semester: IV									
MODULE	COURSE	COURSE TEACHER	From n to x semester	L	S	E	e-learning	ECTS	Required/ elective
	Food, Nutrition and Health	Mauro Serafini	4.	20	15	0	5 %	5	Required
	Elective courses B		3.-4.					6	Elective
	Diplomski rad		4.					20	

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ELECTIVE COURSES A

MODULE	COURSE	COURSE TEACHER	From n to x semester	L	S	E	e-learning	ECTS	Required/ elective
	Basics of measurement methods in nutrition	Jasenka Gajdoš Kljusurić	1.-3.	10	15	15	20 %	3	Elective
	Traditional Diets	Irena Colić Barić	1.-3.	20	15	15	5 %	4	Elective
	Interaction of Essential and Toxic Elements	Ivana Rumora Samarin	1.-3.	10	15	0	10 %	2	Elective
	Probiotics and starter cultures	Jagoda Šušković	1.-3.	16	0	23	20 %	3	Elective
	Food Additives	Dubravka Škevin	1.-3.	20	15	0	5 %	3	Elective
	Food Supplements	Ines Panjkota Krbavčić	1.-3.	15	13	10	5 %	3	Elective
	Gut Microflora, Nutrition and Health	Jagoda Šušković	1.-3.	22	10	17	20 %	4	Elective
	Biologically Active Compounds in Food and Mechanism of Action	Verica Dragović-Uzelac	1.-3.	26	8	12	10 %	4	Elective
	Shelf Life of Packaged Foodstuffs	Mario Ščetar	1.-3.	15	15	0	5 %	3	Elective
	Applied data analysis	Ana Vukelić	1.-3.	10	15	15	10 %	3	Elective
	Modified Fats and Oils	Dubravka Škevin	1.-3.	20	9	6	5 %	3	Elective
	Novel Food	Suzana Rimac Brnčić	1.-3.	30	30	0	5 %	5	Elective
	Nutrigenomics	Jurica Žučko	1.-3.	20	10	20	0 %	4	Elective

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	Nutrition for the Elderly	Irena Keser	1.-3.	15	10	10	10 %	3	Elective
	Enteral and parenteral nutrition	Željko Krznarić	1.-3.	18	10	8	8 %	3	Elective
	Food safety	Mirjana Hruškar	1.-3.	50	15	0	0 %	6	Elective
	Elective A courses from graduate study Food Engineering		1.-3.						
ELECTIVE COURSES B									
MODULE	COURSE	COURSE TEACHER	From n to x semester	L	S	E	e-learning	ECTS	Required/ elective
	Production of Predicate and Sparkling Wines	Natka Ćurko	3.-4.	20	7	8	10 %	3	Elective
	Sensory and Chemometric Evaluation of Wine	Karin Kovačević Ganić	3.-4.	20	0	15	10 %	3	Elective
	Computational Tools for Human Nutrition Modeling	Ana Jurinjak Tušek	3.-4.	10	5	25	5 %	3	Elective
	Role of nutritionist in the health care system	Ksenija Vitale	3.-4.	6	17	0	10 %	2	Elective